ENCLOSURE H

RESPONSES TO COMMENTS RECEIVED AS A RESULT OF PUBLIC REVIEW OF THE DRAFT FEASIBILITY REPORT AND EIS

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Federal Agencies

US Coast Guard (May 21)

U.S. Department 402
of Transportation

Commanding Officer

U.S. Coast Guard
Marine Safety Office

United States
Coast Guard

222 W. Oglethorpe Ave. Suite

Savannah, GA 31401
Staff Symbol: Pwo
Phone- (912) 652-4353

16504
May 21, 1998

Commander
U.S. Army Corps of Engineers, Savannah District
ATTN: William Bailey
Environmental Resources Branch
P.O. Box 889
Savannah, GA 31402-0889

Dear Mr. Bailey:

I have received your letter dated May 6, 1998 concerning the harbor deepening proposal for the Savannah river channel. I am aware of the contamination in the vicinity of the previous site of old Savannah light tower and share your concern. I have provided a copy of your letter to the Aids to Navigation Branch at the Seventh Coast Guard District in Miami, Florida, and have also sent a copy of the Environmental Protection Agency report to the Marine Safety Division at the District office. Both of these offices will develop a plan that addresses the contamination.

Please do not hesitate to contact Lieutenant Burt Lahn or his replacement, Lieutenant (Junior Grade) Heather Morrison, at extension 227 if you need further information.

Sincerely,

R.E. SEEBALD
Commander, U. S. Coast Guard
Captain of the Port

Copy: CCCGDSeven (1)(m)(oan)

Letter response

Captain of the Port
United States Coast Guard
Marine Safety Office
222 W. Oglethorpe Ave. Suite 402
Savannah, GA 31401

May 21, 1998

COMMENT: The Coast Guard is aware of the contamination in the vicinity of the previous site of old Savannah light tower and share your concern. I have provided a copy of your letter to the Aids to Navigation Branch at the Seventh Coast Guard District in Miami, Florida, and have also sent a copy of the EPA report to the Marine Safety Division at the District office. Both of these offices will develop a plan that addresses the contamination.

RESPONSE: GPA and Savannah District intend to work with the Coast Guard to address this situation.

US Coast Guard (July 10)

U.S. Department of Transportation
33130-3050

Commander
Seventh Coast Guard District

909 S.E. 1st Avenue
Miami, FL

Staff Symbol: (oan)
Phone- (305) 530-7655

United States
Coast Guard

JUL 10, 1998

Commander, U.S. Army Corps of Engineers, Savannah District
ATTN: William Bailey
Environmental Resources Branch
P.O. Box 889
Savannah, GA 31402-0889

Dear Mr. Bailey:

I have reviewed your draft Environmental Impart Statement on the proposal to deepen Savannah Harbor and have several comments to offer.

Cadmium levels at the site of Savannah Light: We know of no past Coast Guard activity that could explain the presence of cadmium in your soil samples. We did recover spent aids to navigation batteries from this site when we cleared the wreckage of the old light tower, but the batteries the Coast Guard used do not contain cadmium. Mercury and lead, the two major contaminants from batteries, appear to be absent from the samples. I have no reason to believe that the cadmium you found at the site came from Coast Guard activities.

Polycyclic Aromatic Hydrocarbons (PAH) at the site of Savannah Light: These contaminants could have come from the container lost over the side during the NEPTUNE JADE collision (it contained paint) or from diesel fuel spilled during the same accident. We do not believe that this contamination could have come from the Coast Guard's burning of diesel fuel in the generator at the light, nor from diesel fuel or gasoline burned in boats used to service the light.

Future Sampling: Clearly there are some unanswered questions with regard to the contamination discovered in the bottom sample taken near the site of Savannah light. I suggest that we engage in a program of split sampling to get a better idea of the nature and scope of the contamination in this area.

Recovery Action against Neptune Lines: Even if a causal link to the contamination found at Savannah Light can be established, there could be years of litigation between today and the day remediation at this site would be completed. For your cost-analysis purposes, I recommend that you plan on any remediation at this site to be done at government expense, subject to reimbursement from Neptune Lines.

Piling stubs from Savannah Light: You should be aware that when we recovered the wreckage of Savannah Light, the, pilings were cut off just below the mud line. These may pose difficulties for a contractor working to dredge the channel.

Consider a turn in the Channel: I recommend you review an alternative which would put a small (5 degree or so) bend in the channel near the end of the channel as it exists today. This alternative could pose three distinct advantages. First, ft could avoid the issue of contaminated dredge spoil. Second, it would allow the Coast Guard to construct another range further offshore which would improve channel definition for ships making a transit. Third, it would allow you to avoid the cut off pilings from Savannah Light.

Costs for Aids to Navigation: As explained in our letter of February 10, 1998, the cost for additional aids to navigation is approximately $695,000. If a bend was added to the entrance channel, one additional range would be required at a cost of approximately $250.000. Please ensure these costs are factored in as you perform your analysis on this project.

Lost Buoy Moorings: Your dredge contractors may encounter parted buoy moorings anywhere along the existing channel. These take the form of a concrete sinker in the 5,000 to 20,000 pound range with a length of chain attached. While I cannot ensure that we can report the location of every lost mooring in the channel, I can cheek our records and provide a list of all lost moorings documented in our aid files.

I appreciate the opportunity to comment on this matter. My point of contact is Mr. Joe Embres. He can be reached at (305) 536-5621 if you require more information.

W.S. MILLER
Captain, US Coast Guard
Chief, Aids to Navigation Branch
Seventh Coast Guard District
By direction of the District Commander

Copy: CG MSO Savannah
CG Group Charleston
CGD7 (I), (m)
COMDT (G-LCL), (G-LEL)
MLCA (I)

Letter response

United States Coast Guard
Seventh Coast Guard District
Aids to Navigation Branch
909 S.E. 1st Avenue
Miami, FL 33130-3050

Date: July 10, 1998

1. COMMENT: Cadmium levels at the site of Savannah Light: We know of no past Coast Guard activity that could explain the presence of cadmium in your soil samples. We did recover spent aids to navigation batteries from this site when we cleared the wreckage of the old light tower, but the batteries the Coast Guard used do not contain cadmium. Mercury and lead, the two major contaminants from batteries, appear to be absent from the samples. I have no reason to believe that the cadmium you found at the site came from Coast Guard activities.

RESPONSE: While the elevated cadmium concentrations found in the sediments adjacent to the demolished light tower may not be the result of Coast Guard activities, the levels suggest recent enrichment. The test was rerun on an archive to confirm the metal's presence. It is much more likely that the cadmium came from the Neptune Jade and not the tower, but there is a strong indication of association with the incident.

2. COMMENT: Polycyclic Aromatic Hydrocarbons (PAH) at the site of Savannah Light: These contaminants could have come from the container lost over the side during the NEPTUNE JADE collision (it contained paint) or from diesel fuel spilled during the same accident. We do not believe that this contamination could have come from the Coast Guard's burning of diesel fuel in the generator at the light, nor from diesel fuel or gasoline burned in boats used to service the light.

RESPONSE: Concur.

3. COMMENT: Future Sampling: Clearly there are some unanswered questions with regard to the contamination discovered in the bottom sample taken near the site of Savannah light. I suggest that we engage in a program of split sampling to get a better idea of the nature and scope of the contamination in this area.

RESPONSE: The GPA, USACE, and the USEPA have been in active correspondence over appropriate further action toward defining the magnitude, extent, and potential toxicity of dredged material removed from this location during the disposal in the ODMDS. Please establish contact with Doug Johnson in Region IV USEPA so that knowledge and resources can be combined and an appropriate program established. If a deepening alternative of less than (-)50 ft MLW [(-)52 ft MLW in the Bar Channel] is selected, these sediments may not require excavation to construct the project as the ocean channel will terminate more shoreward.

4. COMMENT: Recovery Action against Neptune Lines: Even if a causal link to the contamination found at Savannah Light can be established, there could be years of litigation between today and the day remediation at this site would be completed. For your cost-analysis purposes, I recommend that you plan on any remediation at this site to be done at government expense, subject to reimbursement from Neptune Lines.

RESPONSE: The investigation of the potential contamination will be investigated further in the Continuing Engineering and Design (CED) phase.

5. COMMENT: Piling stubs from Savannah Light: You should be aware that when we recovered the wreckage of Savannah Light, the, pilings were cut off just below the mud line. These may pose difficulties for a contractor working to dredge the channel.

RESPONSE: Concur.

6. COMMENT: Consider a turn in the Channel: I recommend you review an alternative which would put a small (5 degree or so) bend in the channel near the end of the channel as it exists today. This alternative could pose three distinct advantages. First, ft could avoid the issue of contaminated dredge spoil. Second, it would allow the Coast Guard to construct another range further offshore which would improve channel definition for ships making a transit. Third, it would allow you to avoid the cut off pilings from Savannah Light.

RESPONSE: The investigation of the potential contamination will be investigated further in the CED phase.

7. COMMENT: Costs for Aids to Navigation: As explained in our letter of February 10, 1998, the cost for additional aids to navigation is approximately $695,000. If a bend was added to the entrance channel, one additional range would be required at a cost of approximately $250.000. Please ensure these costs are factored in as you perform your analysis on this project.

RESPONSE: Concur.

8. COMMENT: Lost Buoy Moorings: Your dredge contractors may encounter parted buoy moorings anywhere along the existing channel. These take the form of a concrete sinker in the 5,000 to 20,000 pound range with a length of chain attached. While I cannot ensure that we can report the location of every lost mooring in the channel, I can cheek our records and provide a list of all lost moorings documented in our aid files.

RESPONSE: Concur.

Environmental Protection Agency (June 12)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

Department of the Army
Savannah District, Corps of Engineers
P.O. Box 889
Savannah, GA 31402-0889

Attention: Mr. William Bailey
Environmental Resources Branch
Savannah District Office

Subject: Request for an Extension of the Original Review Period for the Draft Environmental Impact Statement (EIS) for the Proposed Expansion of the Savannah Harbor (SH) Project, Chatham County, Georgia and Jasper County, SC

Dear Sir:

Because of the complicated nature of the water quality modeling associated with this project, we request an extension of the review period to June 29, 1998, in order to more fully explore the environmental consequences of this proposal. Thank you for your consideration of this matter.

Sincerely,

Heinz J. Mueller, Chief
Office of Environmental Assessment

Dated June 12, 1998

Letter response

EPA, Region 4

Office of Environmental Assessment
Atlanta Federal Center
61 Forsyth Street, SW.
Atlanta, Georgia 30303-8909

DATE: June 12, 1998

COMMENT: Request for an extension of the review period to June 29, 1998.

RESPONSE: In a letter dated June 16, 1998, Savannah District granted an extension to EPA until June 29, 1998.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4
ATLANTA FEDERAL CENTER
100 ALABAMA STREET, S.W.
ATLANTA, GEORGIA 30303-3104

July, 13, 1998

Colonel Joseph K. Schmitt
District Engineer
IJ.S. Army Corps of Engineers, Savannah District
P.O. Box 889
Savannah, GA 31402-0889

Attention: Mr. William Bailey
Environmental Resources Branch
Savannah District Office

Subject: Draft Environmental Impact Statement (EIS) – Proposed Expansion of the Savannah Harbor (SH), Chatham County, GA and Jasper County, SC

Dear Colonel Schmitt:

Pursuant to Section 309 of the Clean Air Act and Section 102(2)(C,) of the National Environmental Policy Act (NEPA), EPA, Region 4 has reviewed the evaluation of various upgrades commercial navigation capabilities. Specifically, five channel deepening alternatives (-44', -46', -47', -48', and –50' Mean Low Water (MLW) are compared to present conditions in terms of probable impacts. In 1993-4 the existing channel system was deepened to –42' MLW. On the basis of its shipping analysis the Georgia Port Authority (GPA) now recommends deepening the system another 8' (-50' MLW) with additive amounts of allowable overdraft/advanced maintenance.

EPA has significant concerns regarding the environmental impacts of this proposal as well as the draft EIS's compliance wit the requirements of NEPA. Specifically, we have significant reservations over potential adverse impacts to water quality, fisheries, wetlands, and endangered species. Moreover, we believe the draft EIS does not provide sufficient information regarding the environmental impacts of the proposed project and all reasonable alternatives to the proposed project.

NEPA Procedural Issues

The Council on Environmental Quality's (CEQ) regulations implementing NEPA are clear that an EIS must rigorously explore and objectively evaluate all reasonable alternatives, including the proposed and the no-action alternatives. Moreover, an EIS is intended to provide a comparison of these alternatives to the public and decision-maker(s) from a technical, economic, and environmental perspective. In this case, while the draft EIS purports to examine multiple channel depths, the model used to predict environmental impacts was applied to only one alternative, i.e., GPA's preferred plan. Given the potential for significant changes in dissolved oxygen and salinity levels resulting from a deepened channel, EPA believes it is essential that the model be used to predict impacts to water quality, fisheries, wetlands and endangered species for all considered alternatives. In addition, there are several modifications to the model that are necessary to improve the quality of its predictions. Without the information generated by the model for each alternative, it is impossible for the general public and decision-maker(s) to understand the ramifications of selecting one particular alternative over another.

Sediment Disposal

EPA is also concerned about the proposed use of the Ocean Disposal Site (ODS) and existing, upgraded confined disposal facilities (CDF). Our review of the draft EIS indicates that concentrations of metal/organometallic complexes in some sediments are at such levels that their deposition in the ODS may result in acute/chronic effects to benthic organisms and exceedences of Limiting Permissible Concentrations (LPC) during disposal. In addition, there are uncertainties regarding whether or not all the current CDFs will be operational over the life of this project. Because securing consensus on siting new CDFs would be difficult, we believe it is essential that there be sufficient existing CDF capacity to meet project needs over its entire planning horizon. We look forward to additional consultations with you and your staff on this matter.

Wetland losses

We are concerned over potential impacts to an important wetland system. The draft EIS indicates that over 1,100 acres of tidal freshwater wetlands areas may be indirectly impacted, (i.e., converted to saltwater wetlands) by the enlarged channel prism. As mitigation for these impacts, approximately 3,000 acres of freshwater wetlands would be purchased and donated to the Savannah River National Wildlife Refuge. At this point, it is doubtful whether preservation of existing wetland habitat will provide sufficient mitigation credit for this conversion. We suggest that continued discussions between our staffs on this matter would be helpful.

Water Quality Impacts

Adverse water quality consequences from the deepened channel, especially DO and salinity changes, become increasingly critical with channel depths below –46' MLW. Biota in the water column are recurrently and negatively affected by reduced DO levels. Georgia's state standards for DO in SH are not always being met. The modeling projects that this parameter will be further exacerbated by GPA's plan. Additional modeling data are necessary to evaluate this situation for all alternative depths. As the matter now stands, the deepening impacts are only generally predicted by the current modeling calculations given for the –50' MLW depth. GPA projected this as the "worse case" scenario which would capture all impacts by degree / kind. Hence, intermediate depths were not completely modeled. Use of this "worse case" approach was not the consensus of the interagency working group because it assumes that water quality impacts have a linear relationship. Rather, the group recommended that all channel depths be modeled.

Conclusion

On the basis of our review of the draft EIS, we have rated the recommended alternative as "environmental objections - inadequate Information" (E.O.-3). That is, there will be significant environmental impacts from the deepening to –50' MLW, and that the proposed mitigation measures will not adequately minimize or compensate those adverse impacts. Moreover, we have concluded that the draft EIS does not contain adequate information to accurately and comprehensively assess the impacts associated with the recommended plan and its alternatives. Specifically, fundamental modeling and sediment chemistry information necessary to make a reasoned decision as to the biotic and water quality impacts of each of the deepening alternatives was not presented in the draft EIS. More detailed comments regarding the draft EIS are attached.

It is our opinion that these informational deficiencies are of such magnitude that the necessary information should have full public review at the draft stage, and not merely be appended to a final EIS. We recommend that these shortcomings be addressed by preparing either a supplemental or revised draft EIS which notes the original deficiencies, provides necessary additional data, and evaluates that data in order to reach reasoned conclusions about overall consequences of each alternative. The supplemental or revised draft EIS should answer questions about overall biotic effects for each of the channel depths; how mitigation measures will be designed, implemented, and monitored for success; include more precise information about the potential for unacceptable water quality impacts; provide information on salinity elevation and dissolved oxygen depletion values for incremental depths between existing conditions and the preferred alternative; discuss the actual availability of CDF / ODS disposal sites; and examine options if the impacts subsequently prove to be unacceptable in terms of maintaining water quality standards.

We are sensitive to the economic/societal importance of adequately maintaining SH and its commercial competitiveness and are prepared to continue working with all parties to successfully resolve the above issues in an expeditious manner. However, if the concerns that form the basis of this rating are not resolved adequately, EPA may consider the EIS a candidate for referral to CEQ pursuant to Section 309 of the Clean Air Act.

Thank you for the opportunity to review and comment on this draft ETS. EPA believes that through a collaborative effort by all the involved parties an environmentally sound project can be identified. We suggest that an initial coordination meeting be held as soon as possible to discuss how these environmental and procedural issues will be developed.

Thank you for the opportunity to comment. Please contact Mr. Heinz Muller (404-562-9611) to arrange a meeting to discuss our comments; he will serve as initial point of contact regarding the overall NEPA coordination on the project.

Sincerely,

John H. Hankinson, Jr
Regional Administrator

Attachment

SPECIFIC/DETAILED COMMENTS

Beneficial Use(s) of Dredged Material

The District has established a limit, texture-wise, of 25% for "fines", i.e., as a screening criterion in determining the suitability of sediments for beneficial placement in the near shore environment. We have some concerns about the upper limits of this screen as "fines" are problematic for most uses, especially beach nourishment. The reason(s) for establishing this level are noted in the text, but there are unknowns to the equation. The continued use of the CORMIX model should eventually provide data to substantiate whether “fines” winnowing from deposited material will have unacceptable environmental effects. This will not be easy to ascertain since there is both an areal and temporal component which must be taken into consideration. Given the natural variation occurring in an estuarine environment, “results” of monitoring will probably not be unequivocal.

We would observe that higher "fines" percentages (>10%) are less troubling for some applications, viz., underwater berm construction. However, the statement is made in the text that "percentile of fines within dredged material considered for alternative placement should be less than 50 percent". This would be an incredibly large percentage of silt/clay fractions for any use in the marine environment. Before a precedent is set in regard to an acceptable level we would like to have the matter discussed among the principals.

This matter is moot until the additional geotechnical investigations are conducted to better characterize the subject sediments, especially the quality of the sands and the location of clay/silt beds. When this sediment characterization is completed, decisions can be made as to specific beneficial uses with particular material. The final document should more precisely indicate how/where excavated material will be used instead listing possibilities. It is important that the involved parties have concrete proposals on which to determine feasibility.

In a related matter, we suggest that determining "beneficial uses" may not be as easy as is implied in the text. For example, the use of underwater berms has been effective in altering coastal processes in terms of shoreline erosion. However, there are also instances in which these structures served to focus wave Incidence such that shoreline erosion was exacerbated. Further complicating this issue is the number of construction techniques which can be employed in lessening the effects of sediment placement irrespective of exact percentage of "fines", e.g., submerged discharge ports. While these means were mentioned in the text, there was no commitment to their use. This will also be an item for discussion during subsequent interagency coordination.

Suitable material (larger grain sizes) may be used to construct submerged / feeder berms in the near shore areas along the entrance channel and Tybee / Daufuskie islands, respectively. It should be noted that previous mitigation commitments for other actions are behind agreed upon implementation schedules. Moreover, other items. e.g., bird island construction, are being combined with material excavated attendant to this project. We understand the utility of this approach from a construction standpoint. However, this melding of mitigation items from different work items may prove unnecessarily problematic during subsequent monitoring to determine if success criteria have, been met for each action. This matter will also need to be discussed during subsequent interagency coordination.

Water Quality Considerations

Project induced reductions in dissolved oxygen (DO) levels in SH continue to be a major concern among the stakeholders about this proposal. Industrial operations together with many other up slope commercial activities in the SH estuary, could be significantly affected by any long-term change in DO. Permit effluent conditions would have to be modified, industrial processes altered, and new equipment installed. Non-point runoff restrictions would have to be implemented along with treatment means for unavoidable inputs. There has even been the suggestion in discussions subsequent to the draft EIS that an in-stream oxygen induction system would have to be installed to mitigate the problem. Certainly, the current method of dredging berthing slips via agitation means would come under review. All of these issues must be assessed before a final decision is made on this proposal.

From a biotic perspective additional analysis is also necessary. While there are 1997 monitoring data which provide baseline information for salinity and DO parameters, fish and macro invertebrate species in the SH have not been inventoried since the most recent modifications took place. EPA raised this as a concern / shortcoming about the scope of work for the EIS at the coordination meeting (July 31, 1997) with the U.S. Army Corps of Engineers and Advanced Technology and Management. However, we were told that because of time constraints there was no provision in the EIS study protocol to collect new biological data. There was no subsequent resolution of the matter.

The changes in dissolved oxygen and salinity caused by the physical modifications of the river channel are significant. The extent of these changes may be such that the State of South Carolina's use classification definition (conditions suitable for the survival and propagation of a balanced indigenous aquatic community) would not be met. There are limited opportunities to enhance these water quality conditions through structural measures, but their practicality remains an open issue. Further, there are procedural issues which are operative here. EPA bas already disapproved the State of Georgia’s dissolved oxygen, standard for the primary project area. The establishment or approval of a protective dissolved oxygen number will be difficult if the ecosystem upon which endangered species depends can not support such a protective standard.

The pertinent federal or state resource agency's next procedural step may be to use this information as a justification to modify the current use classification (Use Attainability Analysis). This in turn would justify a new, lesser use classification.

We note that shortnose sturgeon, striped bass and wetlands impacts are addressed in the Draft EIS, but the harbor's remaining species assemblages are not given equivalent consideration. Thus, there is critical data gap in establishing a baseline for overall estuarine species distributions and effects thereon from the proposed deepening. Without these data it is problematic how species changes resulting from the recent changes (the 1993-4 upgrade) in the salinity and dissolved oxygen regimes can be separated from those occurring after this expansion.

As we discussed with your staff during previous coordination meeting, DO is a major indicator of water quality in the estuary. Georgia's existing water quality standard for DO (3.0 mg/L at any time, throughout the water column) was disapproved by EPA. To resolve this matter, EPA recently developed an overall approach for determining DO criteria for saltwater. This approach addresses both the species that are potentially exposed to low levels of dissolved oxygen and the biological effects, survival, growth, and recruitment of larvae, therefrom. We have started using this approach to develop protective DO criteria for SH. A draft of the criteria will be completed this year. EPA plans to collect new biological data for fish and shellfish (juvenile/adults) in the summer of 1999. This will be done to decrease some of the uncertainties with respect to applying the general criteria development approach to SH.

As we previously stated to the District, it is very likely that more stringent DO criteria will be needed to provide the necessary protection to aquatic biota. We also noted that there is insufficient information currently available to determine if the resultant DO concentrations will meet this test. However, for your planning purpose (based on the incomplete information and/or existing model results), it is our opinion that the project will have a significant adverse environmental impact on an already environmentally-stressed ecosystem.

To reiterate, the water quality model developed for this EIS is a good tool for projecting the changes in DO and salinity due to the Harbor deepening. Further, the model has been adequately calibrated. However, the DO criterion we are developing looks at the DO regime in terms of frequency and duration. The future standard may have specific minimum dissolved oxygen levels for 1-hour, 1-day, 7-days and 30-day time periods. Therefore, in evaluating the impacts of the Harbor deepening, the projected changes in the dissolved oxygen regime have to be determined for each time period. Based on the preliminary information in the draft EIS, there is not enough information and model results to make a definitive decision in this regard.

Hence, we need the following information and modeling results for 1) baseline condition; 2) harbor deepening condition; and 3) a "natural" condition (baseline condition without point source pollutant inputs). This includes the following analyses for the Front River (miles 12 to 26), Middle River and Back River:

a) The volume of water with dissolved oxygen concentrations less than 5 mg/L; 4 mg/L;3 mg/l; 2 mg/L; and 1 mg/L for the critical 1-hour, 1-day, 7-day, and 30-day time periods,

b) The area covered by bottom layer dissolved oxygen concentrations less than 5 mg/L; 4 mg/L; 3 mg/L; 2 mg/1; and 1 mg/L for the critical 1-hour, 1-day, 7-day, and 30-day time periods.

The modeling analysis only examined the 50-foot Harbor alternative. All the alternatives (each 2-foot increment) should be evaluated and the requested modeling results provided.

EPA understands that an additional alternative which was not included in the Draft EIS was presented to the Natural Resources Workgroup at a meeting on June 10, 1998. This alternative includes closing off connections between the Middle River and the Front River and reopening New Cut (between the Middle River and the Back River). Because of scheduling conflicts, EPA representatives were unable to attend this meeting. Unfortunately, an alternative meeting date was not practicable. To date, data for this option have not been provided to EPA for review. It is our understanding that this new alternative could have major physical, chemical, and biological impacts on SH. Before EPA can make a decision on its feasibility, the data supporting this new alternative must be examined. Ms. Joan Dupont (404-562-9228), Mr. Jim Greenfield (404-562-9238), Mr. Joel Hansel, (404-562-9274), or Ms. Eve Zimmerman (404-562-9239) should be contacted for consultation on these water quality matters.

EPA is also concerned about another issue in SH that we believe is directly related to this expansion. On May 1, 1998, the Savannah District issued a public notice (960020530) for a proposed regional permit (RPOO098) for private berth maintenance in SH. Five year authorizations are to be granted in four categories of maintenance dredging. These include:

1. Hydraulic cutterhead dredging with disposal in approved Confined Disposal Facilities (CDF) in Georgia and South Carolina,
2. Hydraulic agitation dredging with placement of materials directly in the Federal channel,
3. I-beam agitation dredging, and
4. Clamshell dredging with disposal in an approved CDF.

EPA has had long standing concerns about agitation dredging practices in SH. We believe this water body is particularly susceptible to the adverse impacts of this practice because of DO limitations during the summer months. During this period its aquatic system is already under considerable stress and the continued practice of agitation dredging exacerbates the problem. Moreover, there is a cumulative dimension to the practice as numerous berths are repeatedly excavated. Hence, the EIS evaluation is remiss in not providing adequate information as to how berth maintenance dredging will be affected by the preferred option or the intermediate depth alternatives and what this effect will be.

In letters of February 18, 1998, and May 21, 1998, EPA indicated its misgivings on this matter (RPOO098) to the Savannah District. EPA will be providing additional and more detailed comments to the District under separate cover. It is important to note that EPA believes these two actions have immediate linkage and that the EIS must address the issue to meet an adequacy test. Mr. Rob Lord (404-562-9408) will serve as our contact point on this issue.

Project Scheduling Difficulties

A number of the CDFs, especially in the inner harbor, will have to be enlarged prior to receipt of the additional material from this upgrade. It was noted that these dike improvements can be easily accomplished. The technique of using mounded coarse-grained material adjacent to the front dike to minimize the need for dike improvements is intriguing, but may not be as easy to accomplish as the text implies. This coupled with the relatively tight time schedule for start of construction (July 1999) prompts us to have some misgivings that all the necessary actions can be accomplished on time. It is important to note that the final configuration of the CDF will be an important factor in the project's feasibility, i.e., water quality of effluent discharges will be materially affected by this design. Pre-project modeling results will suggest whether there will be exceedences in water quality standards and the degree of same.

Threatened / Endangered Species Concerns

The draft EIS indicates that the Biological Assessment of Threatened and Endangered Species (BATES) for this project incorporates the conditions referenced in the August 1995 National Marine Fisheries Service's Regional Biological Opinion (BO) covering dredging actions for navigational channels in the Southeast.

The EIS should clarify whether the 1995 National Marine Fisheries Service's BO refers to generic / maintenance operations known as "hopper dredging" or this specific project, i.e., the widening / deepening of the referenced segments of the Savannah River to include disposal and subsequent bathymetry changes.

The "chain of responsibility" pursuant to monitoring for presence of endangered species during dredging operations needs to be specified in greater detail. The language in the BATES states that the *contractor* [italics added] will instruct all personnel associated with the dredging of the presence of manatee (A-34, third paragraph), the presence of Right Whales (A-11 and A-35, fourth paragraph), and monitoring of sea turtles (A-36, second paragraph). From this language the contractor appears to have been delegated the responsibility for instructing workers and subcontractors in the requisite task(s) of endangered species protection. We question the expertise of most dredging contractors to provide these services. Instead, we recommend that qualified, recognized expert personnel be retained to train contractor staff as well as provide subsequent oversight in observing for endangered species.

The references for BATES telephone contacts at state and federal levels need to be updated (A-34). Telephone contacts given for reporting operator collisions with manatees are not current. Similarly, the U.S. Fish and Wildlife number (803) 727-4707 and the Georgia Department of Natural Resources number (912) 264-7218 have been disconnected or are out of service. EPA recommends that all listed contacts be revised to include Agency / Division / Section designation as well as the person (and their title) in charge for reporting subject actions.

We agree with the observation that the sediments underlying the existing harbor project and dredging sites further upstream were laid down by processes long before the industrial age. Hence, contamination problems attendant to the proposal are not a given. However, the Savannah River and its environs have a long history of activities which may contribute to the sequestration of pesticides and organic materials in the overlying sediments. Anthropogenic impacts on these sediments are possible and not always easy to determine without actual inspection. Some pathways, such as wells drilled into the Floridan aquifer and / or excavations into the more surficial groundwater lens, can produce impacts remote to their initiation. The BATES did not contain details of sediment sampling in its analysis.

Specific species affected include:

(1) The biological assessment (BA) implies that manatees are infrequent visitors to the Savannah River. Recently, the situation has changed somewhat, viz., manatees were observed in the Savannah River from October through December of 1997. Last fall a telemetry collared female manatee with a calf was documented in a warm water effluent; several other adult manatees were also sighted at this location. They stayed in the warm water effluent during low tides and fed in the salt marshes during high tide. Robert Turner with the U.S. Fish & Wildlife Service, Manatee Coordinator, Jacksonville FL has more, information regarding this activity. He may be reached at (912) 232-2580.

(2) The BA implies that Northern Right Whales do not frequent the action area. Recent surveys (1997-98) would tend to discount this thesis as these animals have demonstrated more inshore distributions. We acknowledge that most data support a developing hypothesis that this species is usually found in waters cooler than 20 degrees Centigrade. Nonetheless, female whales moving to the calving area off Brunswick pass the Savannah Harbor channel before they give birth and with calves on their return trip.

The Southeast Implementation Team for the Recovery of the Northern Right Whale has much more current information than the 1995 date cited in the EIS with more sightings in the area of concern. Mike Harris with Georgia Department of Natural Resources can be reached for the latest information at (912) 264-7218.

(3) Shortnose Sturgeon were collected in the Savannah Harbor prior to the most recent harbor expansion activities. Fisheries biologists primarily collected juvenile sturgeon in the turning basin. However, there have not been any substantive surveys since 1991; this is before the latest completed harbor expansion and before the subject expansion was formulated. The previous EIS and consultation apparently did not take into consideration the water chemistry changes and the potential adverse effects on this population. The water quality modeling shows that the proposed changes will result in salinity increases and retention time of river water in the harbor. This, in turn, results in even lower dissolved oxygen levels. These lower dissolved oxygen levels are concentrated along the bottom of the river channel which is where juvenile sturgeon were most often found during previous sampling.

The BA considered the modeling results and evaluated the post-project dissolved oxygen conditions. This information indicates that the latest channel configuration and its resultant conditions will be significantly affected. If they are sufficiently severe, the matter may have to be reopened to determine if a "taking" conclusion is warranted for this species. The modeling results indicated dissolved oxygen levels at or below the numbers identified as critical in the BA. The modeling shows new higher salinity numbers which are well above the numbers identified in the BA for an onset of avoidance behavior. As a result, the proposed modifications (previous and proposed) may contribute to significant modifications and degradation of the benthic habitat. This would impair behavioral patterns in the sturgeon's life cycle, such as feeding and sheltering. The overall impacts to the sturgeon must be examined additively. From our perspective a case can be made that they are sufficiently stressful such that the resultant conditions would significantly disrupt normal behavioral patterns to the extent of actual harassment. This matter should be discussed with FWS for resolution. In summary, the preliminary, overall water quality assessment shows that adverse conditions already exist and will be exacerbated by the proposed deepening to the extent that recovery of the sturgeon will be diminished.

The BA proposed a three-year monitoring program. Additional data from this study will augment existing information regarding recruitment, age distribution, telemetry and the relationship between species and water quality. Physical modifications will be undertaken to simulate conditions determined from the noted Collins et al. (1991). The monitoring may assist in documenting whether the demise of this sturgeon population is likely. Because this is critical information, it should have been developed and prepared prior to submission of this proposal.

Mitigation measures such as contouring the river bottom to create depressions (in areas identified prior to the latest channel modifications) which would function as refugia are intriguing, but untried. Moreover, were the hydraulic modifications resulting from these holes factored into the modeling calculations? If so, what were the specific results of their construction? Have any assessments been completed which indicate the longevity of these artificial holes? What can be done if there are unintended/unanticipated consequences, e.g., sediment fill prior to next maintenance?

Has this type of ecosystem modification been successful in addressing essential parameters for any other fish species? As an absolute minimum, the risks associated with this "mitigation effort" need to be determined/balanced against potential upside value. Consensus among the principals should be obtained before implementation.

From an endangered species standpoint, SH should have been allowed to equilibrate after the recent dredging. Subsequent monitoring would have revealed how the juvenile sturgeon were affected by the altered water quality conditions. Unfortunately, this was not case. Had this been done there would have been, at least some suggestion as to whether adverse effects on juvenile sturgeon could be expected from this (similar) proposal. Without this information, the action agency is in a quandary as to actual effects. However, some implications can be drawn, i.e., the BA points out that water quality tolerances of the sturgeon are already being exceeded. Interestingly, these adverse effects do not appear to have been considered with the previous EIS. Since this new information reveals adverse effects of the former action to an extent not previously considered, this may recreate a condition requiring the action agency to reinitiate formal consultation with the Fish and Wildlife Service pursuant to (50 CFR 402.16(b)).

(4) Striped Bass populations will be affected in some fashion by the proposed "replumbing", but this is insufficiently examined. The District is Involved in a Section 1135 project which seeks to determine overall species viability, but the status of this effort is unknown to us. We understand that modeling was requested to address this uncertainty, but this work will not been completed. Without these data, evaluation of the sponsor's preferred alternative is unnecessarily delayed. We would note that observations made to date depict conditions which appear to place this species at risk from incremental salinity changes. Hence, decision-makers on this proposal must examine its impacts in a cumulative context as opposed to viewing the effects of each isolated incident.

For additional consultation on the above issue, contact Mr. Duncan Powell (404) 562-9258 or Mr. John Hamilton (404) 562-9617.

Project Purpose/Need Considerations

We compared the purpose/need data in DEIS and the feasibility report (FR) with the environmental impacts of each incremental deepening option. There is a definite declination point at 46' which has a major bearing on both project purpose and the environmental impacts therefrom. We understand that commercial shipping has shown obvious trends to larger/deeper draft vessels. Improved access from the recent upgrades was among the reasons cited for important increases in containerized shipping at SH. Continuing this line of reasoning the Georgia Port's Authority (GPA) avers that sustained future growth is contingent on having the capacity to service even larger, deeper draft ships (Post-Panamax Class). It has been our experience that operators of commercial harbors throughout Region 4 routinely seek to gain a competitive edge over similar facilities via expedited access, improved shore side infrastructure, better/faster container facilities, etc..

Unfortunately, concomitant with these operational upgrades there are significant adverse environmental costs. The NEPA evaluation balances these conflicting issues such that a decision can be made as to whether the "improvements" are not just feasible, but in the overall public interest. As a result, the underlying reasoning for Georgia Ports Authority's (GPA) desire to increase SH navigation capabilities to 50' is not immediately clear to us. An examination of the numerous tables of shipping statistics in the FR reveals that by the year-2000 there will be only a very limited number of ships worldwide drawing more than 46'. It is uncertain that GPA could even access that market absent a present or anticipated contract arrangement. The notion that merely having deep draft capacity secures deep draft vessels is not a given. The cost benefit ratio reflects this uncertainty. It is important to note that the National Economic Development (NED) selection of the COE's analysis was NOT the recommended plan. Hence, our conclusion that the economic benefits of deepening the harbor beyond 46' are uncertain while the environmental costs are dramatic.

The economics of it particular project only concern us relative to the environmental costs which must be paid to realize this last increment of dollars. This has been a matter of repented discussion with the Savannah District; hence, we will not go into further detail other than to make the declaration that there appears to be very little increased incremental benefit from, or needed for, deepening the harbor beyond 46', while the environmental impacts of deepening beyond 46' feet considerable.

Wetland Impacts / Mitigation

Various means are proposed to mitigate for wetland losses associated with this harbor upgrade. However, mitigation for previous environmental losses associated with upgrading SH are already behind agreed upon implementation schedules and / or are being adversely impacted by this action. From a resource standpoint this situation is perplexing. The local sponsor needs to understand that the lapse in securing necessary, permanent mitigation for previous actions actually increases the amount of mitigation ultimately necessary because temporal loss of wetland functions / values continue to accrue. We are prepared to work with the principals in this regard.

The compensatory mitigation information that has been supplied in the draft EIS is incomplete. As a working premise, we suggest that the "Guidelines on the Establishment and Operation of Mitigation Banks in Georgia" be used as a format. This will first necessitate preparation of the field data worksheets and / or summaries of major / significant parameters and their inclusion 'in the final EIS for evaluation. For the proposed wetland creation we would like to know what type(s) of wetlands will be created, where, how, etc. Other pertinent questions would logically follow. For example, what is the current condition of the land proposed for mitigation? Will the impacts at Steamboat Cut essentially plug the Steamboat River oxbow? If so, how can mitigation occur within the impact area? With respect to the plugging of the oxbow, etc. has there been any analysis of the impact on river flows or impairment of habitat due to changes in sedimentation?

The overall wetland impacts resulting from project implementation and / or operation also need to be more precisely described. The DEIS does not provide enough information to evaluate the project's potential wetland impacts. The location of ALL anticipated direct / indirect project impacts should be presented on a location map along with a tabular representation of these wetland impacts by type. The present organization of the draft EIS makes it difficult to track what impacts will be occurring where. It is clear that for all deepening alternatives approximately 40 acres of wetlands will receive "direct" impacts. "Secondary" impacts due to the conversion of tidally influenced freshwater wetlands to saltwater wetlands increase with the depth of harbor deepening. At the 46' depths the secondary impacts are in the range of 45 acres whereas for GPA's preferred alternative, the secondary impacts could affect an area as great as 1170 acres. As previously noted, this is a significant increase in adverse environmental impacts for a potentially modest increase in potential economic benefits.

For the 40 acres of "indirect" wetland impacts, GPA proposes creation of 80 acres of saltwater wetlands from the closure of an oxbow in the Steamboat River. EPA had difficulty finding any maps in DEIS that specifically denote the location of this mitigation site. Moreover, there was no information on the oxbow's current environmental value. This information needs to be added in the revised document. EPA also recommends that wetland creation, as compensatory mitigation, be provided at a minimum 3:1 ratio of mitigation acreage to impact acreage. Thus, 80 acres would he inadequate. Furthermore, 20 acres of the proposed impacts are from reopening New Cut, a site filled and revegetated to mitigate for a recent harbor upgrade. The logic of this design needs to be much more thoroughly evaluated in the revised document. At the very least, the subject proposal would require additional mitigation not subject to future unilateral deletion / modification by GPA.

Potentially 1170 acres of highly productive, relatively scarce tidally influenced freshwater wetlands will be stressed by elevated salinities. It is probable that much of this area will convert to more abundant saltwater wetlands. To offset this conversion, GPA proposes to purchase / donate approximately 3000 acres of freshwater wetlands (ca. 5:1 ratio of preservation to anticipated / calculated impact area) to the Savannah River National Wildlife Refuge (SRNWR). Historically EPA has had on-going reservations to the use of preservation as a compensatory mitigation means since its it is so difficult to ensure that there will he no long-term, overall "net-loss" of wetland function.

There needs to be up-to-date supporting documentation to substantiate the claim that a maximum 50% decrease in functionality of the 1170 acres of intertidal marsh will occur as a result of the project. Any calculations should rely on updated salinity information, etc. The calculation of mitigation for these impacts should be consisted with the other mitigation calculations, and analyzed at both the site-specific and landscape levels.

The type(s)/location(s) of land which will be acquired for the Wildlife Refuge need to be made known along with discussion about the long-term funding for appropriate management of this land. If this property in unknown, this should be made clear in the final EIS. As you are probably aware, in South Carolina, the Interagency Mitigation Banking Review Team prefers that mitigation credit not be given to areas where there are other options for acquiring, restoring or enhancing the land. The same logic is indicated in the national guidance.

If any of the subject 1170 acres impacted by this project were anticipated to revert to fresh tidal marsh, this should be clarified. This would have particular relevance if they provided any mitigation credit for a previous expansion. As noted previously, this is it very complicated undertaking with many long-term ramifications.

In those instances where preservation has been accepted, a ratio of at least 10:1 is more common and only for proposed mitigation areas which are at immediate threat of (land use) conversion. Unless it can be demonstrated that these acquired properties meet the latter test, the fact that they may be listed in the SRNWR acquisition list is moot. Where this is not the case, EPA recommends that another form of compensatory mitigation (wetland restoration, enhancement, or creation) be investigated. These measures would form the core of functional restoration and could be combined with the noted wetland preservation. EPA intends to conduct a site inspection of the impacted areas in the immediate future to evaluate the entire subject area. The assistance of your technical staff in this regard would be appreciated.

The "impact avoidance option" documentation for closure of Middle River from Front River and reopening New Cut needs to be provided together with salinity, documentation, and current effects on wetlands in the Front River. How will sedimentation, and currents be affected in the Middle and Back Rivers if this “replumbing” occurs? Similarly, what are the projected changes (if any) for maintenance material which must be dredged? The three locations at which the Middle River will be cut off from the Front River need to be included in the wetland map and accompanying table(s) along with a characterization of their present condition/environmental values.

The proposed bend wideners would have direct wetland impacts at six locations. The information that is presented with respect to the "daylight line" and the “sloughing casement” and the manner in which the encroachment areas were calculated needs to be explained more effectively. For your information the applicable figure is 4-12 and not 4-21 (See page 5-53).

According to the DEIS, wetland impacts within the existing sloughing casement were conceptually addressed in the Environmental Impact Analysis associated with the previous channel improvement project. In turn, these impacts were eventually compensated via construction of the wetland creation (10 acres) project within the former New Cut (Page 5-53).

Therefore, the mitigation requirements associated with wetland habitat lost attendant to reopening New Cut are not as straightforward n some other project resource consequences. This matter will require deliberation among the principals during the next interagency meeting (page 5-53).

For further discussion on the above matters, Mr. Bob Lord (404) 562-9408 and Mr. Hudson Slay (404) 562-9388 will serve as initial points of contact.

Groundwater Impacts

It was noted that the potential for contamination of the Floridan aquifer from the increased channel depths is unlikely. We agree that the preliminary data support this conclusion. However, it would be helpful if the final EIS had some exposition regarding the measures which could be implemented if contamination were to occur. The increasing chloride content of Savannah's water may not be legally "compensatable", but it appears to be posing a problem to some of the industrial users. We look forward with interest to the results of the forthcoming report on this matter.

Project Design

The channel prism will retain its lateral dimensions and side wall configuration with only centerline depths altered. This was done in the interest of lessening environmental impacts. We concur with this objective. However, whether the channel will stabilize without significant amounts of bank slumping and adjacent wetland loss remain to be seen. This goal seems to be most dependent on the intrinsic stability of the new work material being excavated, long-term effects of wake turbulence produced by deep-draft vessel passage, and impacts of usual/unusual episodes of currents. None of these parameters has been fully evaluated in the draft EIS.

As we noted in our review of the last deepening, the shore side ramifications of this action, viz., terminals, utility infrastructure, transportation access, are important and need to be assessed to determine their significance. This is true notwithstanding efforts to moderate many of these effects by yet untested/high risk mitigation.

Preliminary Observations - Section 103 Concerns

There needs to be a more precise depiction/discussion of the sediment sampling locations in relation to the project alternatives/reaches. We noted the many references to various locations, station numbers, reaches, and reference points, but they are not consistently marked on any of the maps provided. Additionally, there does not appear to be any explanation or reference chart for the individual samples used to make up composite samples for chemical analyses. Without such a reference, results from composited samples cannot be correlated to specific project reaches and disposal alternatives. We would like to see a project map showing all sampling locations, project reaches, COE navigational station identifications, and disposal alternatives for each project segment.

We would also like to see a chart indicating which samples contributed to each composite sample, including identification of the portion of each core sample that contributed to the “New Work” or "O&M" or "Widener" composites.

Procedurally a concurrence for ocean disposal cannot be based on the filing of a draft EIS. The process starts with it formal request (addressed to the EPA, Wetlands, Coastal, and Water Quality Branch when a final project exists) for review of the MPRSA Section 103 Evaluation and associated supporting documentations, and for EPA concurrence with the USCOE determination that the material is suitable for ocean disposal in accordance with 40 CFR Sections 220-228. EPA has 45 days to either respond to the request for concurrence, request an extensions or request additional information. The Memorandum of Understanding between the South Atlantic Division and Region 4, and the Ocean Dumping Regulations require full and direct coordination between COE and EPA for all ocean disposal projects. The coordination between the appropriate departments of these two agencies must be conducted independent of the review and comment on the draft EIS.

Based on the information provided and reviewed to date, it appears that the material proposed in the preferred alternative may not be suitable for ocean disposal. Furthermore, the material proposed for upland disposal may pose a serious threat to aquatic organisms and wildlife, and the effluent from the CDFs may not comply with State WQS. This assessment is based on potentially elevated levels of tributyltin, cadmium, and various metals, PARS, and dioxins,, and the fact that we have not had sufficient time to complete our review and to check all theoretical calculations and model outputs. Tributyltin values appear to range from 2,311 ug TBT / kg OC to 51,560 ug TBT / kg OC in samples taken for this project. The EPA draft proposed chronic water quality criterion for TBT is associated with a sediment concentration of 251 ug TBT / kg OC based on equilibrium partitioning. The 18th percentile for chronic effects is 1,255 ug TBT / kg OC, and the 112nd percentile for chronic effects / 15th percentile for acute effects is 17,570 ug TBT / kg OC. Additional testing will be required to assess the potential for adverse effects due to high levels of tributyltin in a number of samples taken throughout the proposed project area.

In summary, if the results of the requested additional testing reveal ecological impacts due to contaminants in the proposed dredged material, this could result in the material from some portions of the project being classified as unsuitable for ocean disposal. By extension this would prevent EPA from concurring with a USCOE determination of suitability for ocean disposal. Since this would have such fundamental ramifications for the project, details of future testing requirements and the results therefrom should be coordinated directly with Mr. Doug Johnson (404-562-9386) to avoid any unnecessary delays.

Water Quality Modeling

It is not clear from the text whether all of the modeling calculations recognized that cited channel depths would actually include significant amounts of over dredging/advanced maintenance. This introduction of error could have been a reason why modeling for previous upgrades underestimated and/or did not predict the trends in salinity/dissolved oxygen in the project area.

Savannah River Basin Watershed Project

Most of the above concerns regarding this SH proposal have already been identified by the Savannah River Basin Watershed (SRBW) Project stakeholders in its "Initial Assessment and Prioritization Report". Because of there is a great deal of overlap of interest/impact between the two activities, we suggest that GPA work closely with the SRBW group. Ms. Meredith Anderson (404-562-9268) will be the EPA contact point to discuss mutually relevant issues for these activities.

Letter response

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
100 ALABAMA STREET, S.W.
ATLANTA, GEORGIA 30303-3104

Date: July 13, 1998

1. COMMENT: EPA has significant concerns regarding the environmental impacts of this proposal as well as the DEIS's compliance wit the requirements of NEPA. Specifically, they have significant reservations over potential adverse impacts to water quality, fisheries, wetlands, and endangered species. They believe the DEIS does not provide sufficient information regarding the environmental impacts of the proposed project and all reasonable alternatives to the proposed project.

RESPONSE: The proposed scope of the DEIS was stated as a "worst case scenario" addressing the potential impacts of the deepest alternative, a 50 foot channel. All other alternative project depths would have less impact. Additional studies will be performed in the CED phase to evaluate alternative depths.

2. COMMENT: NEPA Procedural Issues - The CEQ regulations implementing NEPA are clear that an EIS must rigorously explore and objectively evaluate all reasonable alternatives, including the proposed and the no-action alternatives. Moreover, an EIS is intended to provide a comparison of these alternatives to the public and decision-maker(s) from a technical, economic, and environmental perspective. In this case, while the DEIS purports to examine multiple channel depths, the model used to predict environmental impacts was applied to only one alternative, i.e., GPA's preferred plan. Given the potential for significant changes in dissolved oxygen and salinity levels resulting from a deepened channel, EPA believes it is essential that the model be used to predict impacts to water quality, fisheries, wetlands and endangered species for all considered alternatives. In addition, there are several modifications to the model that are necessary to improve the quality of its predictions. Without the information generated by the model for each alternative, it is impossible for the general public and decision-maker(s) to understand the ramifications of selecting one particular alternative over another.

RESPONSE: The proposed scope of the DEIS was stated as a "worst case scenario" addressing the potential impacts of the deepest alternative, a 50 foot channel. All other alternative project depths would have less impact. Additional studies will be performed in the CED phase to evaluate alternative depths.

3. COMMENT: Sediment Disposal - EPA is also concerned about the proposed use of the ODMDS and existing, upgraded CDFs. Their review of the DEIS indicates that concentrations of metal/organometallic complexes in some sediments are at such levels that their deposition in the ODMDS may result in acute/chronic effects to benthic organisms and exceedences of Limiting Permissible Concentrations (LPC) during disposal. In addition, there are uncertainties regarding whether or not all the current CDFs will be operational over the life of this project. Because securing consensus on siting new CDFs would be difficult, EPA believes it is essential that there be sufficient existing CDF capacity to meet project needs over its entire planning horizon.

RESPONSE: The GPA, USACE, and the USEPA are actively corresponding to determine appropriate further evaluation of the organotin compounds reported in the existing project O&M material. The vast majority of the actual deepening project sediments are relatively free from these compounds and are not expected to impact aquatic or terrestrial life. There exists little information on the bioavailability and toxicity of sediment-sorbed TBT. Less information exists concerning potential terrestrial effects. The material appears to be tightly bound up with the sediments as TBT was not detected in the elutriate samples. Few assessment tools are available for evaluating its toxicity in supplemental.

The Engineering Feasibility Study concluded that sufficient capacity is available in the CDFs over the entire project horizon.

4. COMMENT: Wetland losses – EPA is concerned over potential impacts to an important wetland system. The DEIS indicates that over 1,100 acres of tidal freshwater wetlands areas may be indirectly impacted, (i.e., converted to saltwater wetlands) by the enlarged channel prism. As mitigation for these impacts, approximately 3,000 acres of freshwater wetlands would be purchased and donated to the Savannah NWR. At this point, it is doubtful whether preservation of existing wetland habitat will provide sufficient mitigation credit for this conversion.

RESPONSE: the surface salinity will be greater than 0.5 ppt. The other 50 percent of the time, the salinity will be less than 0.5 ppt. The 50 percentile salinity at 8,200 cfs was used as representative of an average condition that may be expected and was the subject of long discussion among the technical advisory group. While the 1,170 acre zone will be subject more frequently to salinities higher than 0.5 ppt, it is inappropriate to state that 1,170 acres of tidal freshwater marsh will be lost. Under various tide and river flow conditions, the area within the 1,170 acre zone certainly is already subjected to salinity levels above 0.5 ppt. The long-term effect of the post-project change in salinity level frequency will have on the vegetative composition of the tidal freshwater marshes is a ripe subject for further study. Whatever the salinity effect may be, it is more likely to manifest itself as a subtle, long-term change than a conveniently quantifiable wholesale conversion of tidal freshwater marsh into an intermediate marsh.

In addition, any changes in the marsh composition as a result of post-project induced salinity changes would occur against the backdrop of "natural" changes that would be occurring within the marshes even in the absence of the port project. Under no scenario would any tidal freshwater marsh be converted into saltwater marsh. In the next phase of the project it is proposed that the potential long-term effect of salinity values on marsh composition be more thoroughly studied. This study would include deployment of a network of salinity data loggers within the marsh and tidal channels to more precisely monitor the magnitude and variation of salinity values within the marshes. This study would be augmented with additional studies of other factors affecting marsh succession including substrate variability and water levels. These studies would be used to support development of a dynamic marsh succession model for use as a predictive and management tool.

5. COMMENT: Water Quality Impacts - Adverse water quality consequences from the deepened channel, especially DO and salinity changes, become increasingly critical with channel depths below –46' MLW. Biota in the water column are recurrently and negatively affected by reduced DO levels. GA's state standards for DO in SH are not always being met. The modeling projects that this parameter will be further exacerbated by GPA's plan. Additional modeling data are necessary to evaluate this situation for all alternative depths. As the matter now stands, the deepening impacts are only generally predicted by the current modeling calculations given for the –50' MLW depth. GPA projected this as the "worse case" scenario which would capture all impacts by degree/kind. Hence, intermediate depths were not completely modeled. Use of this "worse case" approach was not the consensus of the interagency working group because it assumes that water quality impacts have a linear relationship. Rather, the group recommended that all channel depths be modeled.

RESPONSE: Additional model simulations that address the impacts at intermediate depths between -42 feet MLW and -50 feet MLW are to be run during the CED phase of the project. The results of these simulations will be presented in the Tier II EIS to be completed during the CED phase.

6. COMMENT: Conclusion -- On the basis of EPA's review of the DEIS, they have rated the recommended alternative as "Environmental Objections - Inadequate Information" (E.O.-3). That is, there will be significant environmental impacts from the deepening to –50' MLW, and that the proposed mitigation measures will not adequately minimize or compensate those adverse impacts. Moreover, they concluded that the DEIS does not contain adequate information to accurately and comprehensively assess the impacts associated with the recommended plan and its alternatives. Specifically, fundamental modeling and sediment chemistry information necessary to make a reasoned decision as to the biotic and water quality impacts of each of the deepening alternatives was not presented in the DEIS.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

7. COMMENT: Conclusion -- It is EPA's opinion that these informational deficiencies are of such magnitude that the necessary information should have full public review at the draft stage, and not merely be appended to a Final EIS. We recommend that these shortcomings be addressed by preparing either a Tier II or revised DEIS which notes the original deficiencies, provides necessary additional data, and evaluates that data in order to reach reasoned conclusions about overall consequences of each alternative. The Tier II or revised DEIS should answer questions about overall biotic effects for each of the channel depths; how mitigation measures will be designed, implemented, and monitored for success; include more precise information about the potential for unacceptable water quality impacts; provide information on salinity elevation and dissolved oxygen depletion values for incremental depths between existing conditions and the preferred alternative; discuss the actual availability of CDF/ODMDS disposal sites; and examine options if the impacts subsequently prove to be unacceptable in terms of maintaining water quality standards.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

8. COMMENT: EPA states they are sensitive to the economic/societal importance of adequately maintaining SH and its commercial competitiveness and are prepared to continue working with all parties to successfully resolve the above issues in an expeditious manner. However, if the concerns that form the basis of this rating are not resolved adequately, EPA may consider the EIS a candidate for referral to CEQ pursuant to Section 309 of the Clean Air Act.

RESPONSE: No response necessary.

9. COMMENT: EPA believes that through a collaborative effort by all the involved parties an environmentally sound project can be identified.

RESPONSE: The mitigation process described in the EIS will include participation by a stakeholders group in addressing these issues.

SPECIFIC / DETAILED COMMENTS

Beneficial Use(s) of Dredged Material

10. COMMENT: The District has established a limit, texture-wise, of 25% for "fines", i.e., as a screening criterion in determining the suitability of sediments for beneficial placement in the near shore environment. EPA has some concerns about the upper limits of this screen, as "fines" are problematic for most uses, especially beach nourishment. The reason(s) for establishing this level are noted in the text, but there are unknowns to the equation. The continued use of the CORMIX model should eventually provide data to substantiate whether “fines” winnowing from deposited material will have unacceptable environmental effects. This will not be easy to ascertain since there is both an areal and temporal component which must be taken into consideration. Given the natural variation occurring in an estuarine environment, “results” of monitoring will probably not be unequivocal.

RESPONSE: The limit of 25% has been established by the USACE as a reasonable screening criteria. Material with higher fines would require further evaluations.

11. COMMENT: EPA observes that higher "fines" percentages (>10%) are less troubling for some applications, viz., underwater berm construction. However, the statement is made in the text that "percentile of fines within dredged material considered for alternative placement should be less than 50 percent". This would be an incredibly large percentage of silt / clay fractions for any use in the marine environment.

RESPONSE: A maximum limit of 50% fines was determined by the USACE based on previous experience, which included the last deepening project.

12. COMMENT: The fines content issue is moot until the additional geotechnical investigations are conducted to better characterize the subject sediments, especially the quality of the sands and the location of clay / silt beds. When this sediment characterization is completed, decisions can be made as to specific beneficial uses with particular material. The final document should more precisely indicate how / where excavated material will be used instead listing possibilities. It is important that the involved parties have concrete proposals on which to determine feasibility.

RESPONSE: Additional geotechnical information will be collected in the CED phase and will be used to further assess the potential for beneficial use of dredged materials.

13. COMMENT: EPA suggests that determining "beneficial uses" may not be as easy as is implied in the text. For example, the use of underwater berms has been effective in altering coastal processes in terms of shoreline erosion. However, there are also instances in which these structures served to focus wave Incidence such that shoreline erosion was exacerbated. Further complicating this issue is the number of construction techniques which can be employed in lessening the effects of sediment placement irrespective of exact percentage of "fines", e.g., submerged discharge ports. While these means were mentioned in the text, there was no commitment to their use.

RESPONSE: ATM prepared an Alternative Ocean Dredged Material Placement Study, which identified potential wave focusing as an important factor in the design of submerged berms. If the submerged berm is chosen as a beneficial use alternative, the berm design will include a berm geometry and placement location that minimizes wave focusing. Additionally, the beneficial uses will be constructed using environmentally acceptable techniques. The EIS will be amended to reflect this.

14. COMMENT: Suitable material (larger grain sizes) may be used to construct submerged / feeder berms in the nearshore areas along the entrance channel and Tybee / Daufuskie islands, respectively. It should be noted that previous mitigation commitments for other actions are behind agreed upon implementation schedules. Moreover, other items. e.g., bird island construction, are being combined with material excavated attendant to this project. We understand the utility of this approach from a construction standpoint. However, this melding of mitigation items from different work items may prove unnecessarily problematic during subsequent monitoring to determine if success criteria have been met for each action.

RESPONSE: The use of dredged material from the proposed project has not been committed to any other project.

Water Quality Considerations

15. COMMENT: Project induced reductions in DO levels in SH continue to be a major concern among the stakeholders about this proposal. Industrial operations together with many other up-slope commercial activities in the SH estuary, could be significantly affected by any long-term change in DO. Permit effluent conditions would have to be modified, industrial processes altered, and new equipment installed. Non-point runoff restrictions would have to be implemented along with treatment means for unavoidable inputs. There has even been the suggestion in discussions subsequent to the DEIS that an in-stream oxygen induction system would have to be installed to mitigate the problem. Certainly, the current method of dredging berthing slips via agitation means would come under review. All of these issues must be assessed before a final decision is made on this proposal.

RESPONSE: No Response Necessary

16. COMMENT: From a biotic perspective additional analysis is also necessary. While there are 1997 monitoring data which provide baseline information for salinity and DO parameters, fish and macro invertebrate species in the SH have not been inventoried since the most recent modifications took place. EPA raised this as a concern/shortcoming about the scope of work for the EIS at the July 1997 coordination meeting with the Corps and ATM. However, they were told that because of time constraints there was no provision in the EIS study protocol to collect new biological data. There was no subsequent resolution of the matter.

RESPONSE: The DEIS made use of existing information on all species of concern and listed species.

17. COMMENT: The changes in DO and salinity caused by the physical modifications of the river channel are significant. The extent of these changes may be such that SC's use classification definition (conditions suitable for the survival and propagation of a balanced indigenous aquatic community) would not be met. There are limited opportunities to enhance these water quality conditions through structural measures, but their practicality remains an open issue. Further, there are procedural issues which are operative here. EPA bas already disapproved GA's DO standard for the primary project area. The establishment or approval of a protective DO number will be difficult if the ecosystem upon which endangered species depends can not support such a protective standard. The pertinent federal or state resource agency's next procedural step may be to use this information as a justification to modify the current use classification (Use Attainability Analysis). This in turn would justify a new, lesser use classification.

RESPONSE: No Response Necessary.

18. COMMENT: EPA notes that shortnose sturgeon, striped bass and wetlands impacts are addressed in the DEIS, but the harbor's remaining species assemblages are not given equivalent consideration. Thus, there is critical data gap in establishing a baseline for overall estuarine species distributions and effects thereon from the proposed deepening. Without these data it is problematic how species changes resulting from the recent changes (the 1993-4 upgrade) in the salinity and dissolved oxygen regimes can be separated from those occurring after this expansion.

RESPONSE: The DEIS made use of existing information on all species of concern and listed species.

19. COMMENT: As EPA discussed at the coordination meeting, DO is a major indicator of water quality in the estuary. GA's existing water quality standard for DO (3.0 mg/L at any time, throughout the water column) was disapproved by EPA. To resolve this matter, EPA recently developed an overall approach for determining DO criteria for saltwater. This approach addresses both the species that are potentially exposed to low levels of DO and the biological effects, survival, growth, and recruitment of larvae, therefrom. EPA has started using this approach to develop protective DO criteria for SH. A draft of the criteria will be completed this year. EPA plans to collect new biological data for fish and shellfish (juvenile/adults) in the summer of 1999. This will be done to decrease some of the uncertainties with respect to applying the general criteria development approach to SH.

RESPONSE: No Response Necessary.

20. COMMENT: As EPA previously stated to the District, it is very likely that more stringent DO criteria will be needed to provide the necessary protection to aquatic biota. They also noted that there is insufficient information currently available to determine if the resultant DO concentrations will meet this test. However, for planning purposes (based on the incomplete information and/or existing model results), it is EPA's opinion that the Project will have a significant adverse environmental impact on an already environmentally-stressed ecosystem.

RESPONSE: No Response Necessary.

21. COMMENT: The water quality model developed for this EIS is a good tool for projecting the changes in DO and salinity due to the Harbor deepening. Further, the model has been adequately calibrated.

RESPONSE: No Response Necessary.

22. COMMENT: The DO criterion EPA is developing looks at the DO regime in terms of frequency and duration. The future standard may have specific minimum dissolved oxygen levels for 1-hour, 1-day, 7-days and 30-day time periods. Therefore, in evaluating the impacts of the Harbor deepening, the projected changes in the DO regime have to be determined for each time period. Based on the preliminary information in the DEIS, there is not enough information and model results to make a definitive decision in this regard.

RESPONSE: Additional refinement of the dissolved oxygen model is proposed for the CED phase of the project. This work will be performed in cooperation with local industrial stakeholders. Model inputs and evaluation criteria will be refined and the results of the revised model will be presented in the Tier II EIS. The impacts under varying time periods will also be presented in the Tier II EIS.

23. COMMENT: EPA needs the following information and modeling results for (1) baseline condition; (2) harbor deepening condition; and (3) a "natural" condition (baseline condition without point source pollutant inputs). This includes the following analyses for the Front River (miles 12 to 26), Middle River and Back River:

a) The volume of water with dissolved oxygen concentrations less than 5 mg/L; 4 mg/L;3 mg/l; 2 mg/L; and 1 mg/L for the critical 1-hour, 1-day, 7-day, and 30-day time periods,

b) The area covered by bottom layer dissolved oxygen concentrations less than 5 mg/L; 4 mg/L; 3 mg/L; 2 mg/1; and 1 mg/L for the critical 1-hour, 1-day, 7-day, and 30-day time periods.

RESPONSE: Additional refinement of the dissolved oxygen model is proposed for the CED phase of the project. This work will be performed in cooperation with local industrial stakeholders. Model inputs and evaluation criteria will be refined and the results of the revised model will be presented in the Tier II EIS. The data requested will also be provided in the Tier II EIS.

24. COMMENT: The modeling analysis only examined the 50-foot alternative. All the alternatives (each 2-foot increment) should be evaluated and the requested modeling results provided.

RESPONSE: Additional model simulations that address the impacts at intermediate depths between -42 feet MLW and -50 feet MLW are to be run during the CED phase of the project. The results of these simulations will be presented in the Tier II EIS to be completed during the CED phase.

25. COMMENT: EPA understands that an additional alternative which was not included in the DEIS was presented to the Natural Resources Workgroup at a meeting on June 10, 1998. This alternative includes closing off connections between the Middle River and the Front River and reopening New Cut (between the Middle River and the Back River). To date, data for this option have not been provided to EPA for review. It is EPA's understanding that this new alternative could have major physical, chemical, and biological impacts on SH. Before EPA can make a decision on its feasibility, the data supporting this new alternative must be examined.

RESPONSE: Data on the impacts of this option on salinity are presented within the final EIS. Data on the impacts of this option on dissolved oxygen will be presented within the Tier II EIS to be completed during the CED phase.

26. COMMENT: EPA is also concerned about another issue in SH that it believes is directly related to this expansion. On May 1, 1998, the Savannah District issued a public notice (960020530) for a proposed regional permit (RPOO098) for private berth maintenance in SH. Five-year authorizations are to be granted in four categories of maintenance dredging. EPA has had long standing concerns about agitation dredging practices in SH. They believe this water body is particularly susceptible to the adverse impacts of this practice because of DO limitations during the summer months. During this period its aquatic system is already under considerable stress and the continued practice of agitation dredging exacerbates the problem. Moreover, there is a cumulative dimension to the practice as numerous berths are repeatedly excavated. Hence, the EIS evaluation is remiss in not providing adequate information as to how berth maintenance dredging will be affected by the preferred option or the intermediate depth alternatives and what this effect will be. In letters of February 18, 1998, and May 21, 1998, EPA indicated its misgivings on this matter (RPOO098) to the Savannah District. EPA will be providing additional and more detailed comments to the District under separate cover. It is important to note that EPA believes these two actions have immediate linkage and that the EIS must address the issue to meet an adequacy test.

RESPONSE: The proposed deepening proposal does not include agitation dredging either for construction or for project maintenance and is therefore not related to the expansion project except that sedimentation patterns will undoubtedly change in the Harbor. In most cases, the deeper channel and especially the turning basins will result in increased sedimentation within the limits of the federal project, which will result in reduced berth maintenance aggregately.

Berth maintenance is typically undertaken by traditional hydraulic cutterhead dredging equipment with dredged material placement either in the Harbor CDF system or in a private upland site. Agitation dredging is conducted periodically in berths under permit and with a conditioned 401 Certification that requires the DO monitoring be conducted before and during the dredging events. These conditions set thresholds below which agitation dredging can not be initiated or continued. We are not aware of any studies that show that permitted agitation dredging conducted in the berths in the summer months is responsible for measurable adverse impacts to aquatic biota in excess of normal tidal resuspension in the Harbor or the oxygen demand of a summer thunderstorm in the lower basin. Any oxygen-demanding effects produced by this activity should be short-lived and localized both areally and vertically.

Project Scheduling Difficulties

27. COMMENT: A number of the CDFs, especially in the inner harbor, will have to be enlarged prior to receipt of the additional material from this upgrade. It was noted that these dike improvements can be easily accomplished. The technique of using mounded coarse-grained material adjacent to the front dike to minimize the need for dike improvements is intriguing, but may not be as easy to accomplish as the text implies. This coupled with the relatively tight time schedule for start of construction (July 1999) prompts EPA to have some misgivings that all the necessary actions can be accomplished on time. It is important to note that the final configuration of the CDF will be an important factor in the project's feasibility, i.e., water quality of effluent discharges will be materially affected by this design. Pre-project modeling results will suggest whether there will be exceedences in water quality standards and the degree of same.

RESPONSE: July 1999 was the projected date for the advertisement of the Dike Raising contract. 6 months was allowed to raise the dikes before dredging would commence in the Inner Harbor. This technique for raising the dikes has been used successfully over the past 10 years in the Savannah Harbor Disposal areas. The design of the CDF will include water quality requirements of the effluent discharges.

Threatened/Endangered Species Concerns

28. COMMENT: The DEIS indicates that the BATES for this project incorporates the conditions referenced in the August 1995 NMFS's Regional BO covering dredging actions for navigational channels in the Southeast. The EIS should clarify whether the 1995 NMFS's BO refers to generic/maintenance operations known as "hopper dredging" or this specific project, i.e., the widening/deepening of the referenced segments of the Savannah River to include disposal and subsequent bathymetry changes.

RESPONSE: The DEIS has incorporated the conditions referenced in the August 1995 NMFS Regional BO specifically in reference to conditions governing "hopper dredges." No other use of the 1995 BO is suggested or intended.

29. COMMENT: The "chain of responsibility" pursuant to monitoring for presence of endangered species during dredging operations needs to be specified in greater detail. The language in the BATES states that the <u>contractor</u> will instruct all personnel associated with the dredging of the presence of manatee, the presence of Right Whales, and monitoring of sea turtles. From this language the contractor appears to have been delegated the responsibility for instructing workers and subcontractors in the requisite task(s) of endangered species protection. EPA questions the expertise of most dredging contractors to provide these services. Instead, EPA recommends that qualified, recognized expert personnel be retained to train contractor staff as well as provide subsequent oversight in observing for endangered species.

RESPONSE: Concur. The BATES text has been edited to include reference to a qualified, recognized expert. The expert will be retained to instruct contractor staff and will provide subsequent oversight in observing for endangered species.

30. COMMENT: The references for BATES telephone contacts at state and federal levels need to be updated. Telephone contacts given for reporting operator collisions with manatees are not current. EPA recommends that all listed contacts be revised to include Agency/Division/Section designation as well as the person (and their title) in charge for reporting subject actions.

RESPONSE: Phone numbers given for reporting operator (or any collisions) with manatee have been updated.

31. COMMENT: EPA agrees with the observation that the sediments underlying the existing harbor project and dredging sites further upstream were laid down by processes long before the industrial age. Hence, contamination problems attendant to the proposal are not a given. However, the Savannah River and its environs have a long history of activities which may contribute to the sequestration of pesticides and organic materials in the overlying sediments. Anthropogenic impacts on these sediments are possible and not always easy to determine without actual inspection. Some pathways, such as wells drilled into the Floridan aquifer and/or excavations into the more surficial groundwater lens, can produce impacts remote to their initiation. The BATES did not contain details of sediment sampling in its analysis.

RESPONSE: The BATES was revised to include this information and appropriate references to the project Sampling and Analysis Plan (SAP) and the Dredged Material Environmental Effects Evaluation (DMEEE).

32. COMMENT: The BATES implies that manatees are infrequent visitors to the Savannah River. Recently, the situation has changed somewhat, viz., manatees were observed in the Savannah River from October through December of 1997. Last fall a telemetry collared female manatee with a calf was documented in a warm water effluent; several other adult manatees were also sighted at this location. They stayed in the warm water effluent during low tides and fed in the salt marshes during high tide. Robert Turner with the USFWS, Manatee Coordinator, Jacksonville FL has more, information regarding this activity.

RESPONSE: The BATES has been revised to include more current manatee sighting data. Data on telemetry collared female and calf as well as locations of other recent sightings were added to the BATES as well.

33. COMMENT: The BATES implies that Northern Right Whales do not frequent the action area. Recent surveys (1997-98) would tend to discount this thesis as these animals have demonstrated more inshore distributions. EPA acknowledges that most data support a developing hypothesis that this species is usually found in waters cooler than 20 degrees Centigrade. Nonetheless, female whales moving to the calving area off Brunswick pass the Savannah Harbor channel before they give birth and with calves on their return trip. The Southeast Implementation Team for the Recovery of the Northern Right Whale has much more current information than the 1995 date cited in the EIS with more sightings in the area of concern.

RESPONSE: The BATES has been revised to include more current information.

34. COMMENT: Shortnose Sturgeon were collected in the Savannah Harbor prior to the most recent harbor expansion activities. Fisheries biologists primarily collected juvenile sturgeon in the turning basin. However, there have not been any substantive surveys since 1991; this is before the latest completed harbor expansion and before the subject expansion was formulated. The previous EIS and consultation apparently did not take into consideration the water chemistry changes and the potential adverse effects on this population. The water quality modeling shows that the proposed changes will result in salinity increases and retention time of river water in the harbor. This, in turn, results in even lower DO levels. These lower DO levels are concentrated along the bottom of the river channel which is where juvenile sturgeon were most often found during previous sampling.

The BATES considered the modeling results and evaluated the post-project DO conditions. This information indicates that the latest channel configuration and its resultant conditions will be significantly affected. If they are sufficiently severe, the matter may have to be reopened to determine if a "taking" conclusion is warranted for this species. The modeling results indicated DO levels at or below the numbers identified as critical in the BATES. The modeling shows new higher salinity numbers that are well above the numbers identified in the BATES for an onset of avoidance behavior. As a result, the proposed modifications (previous and proposed) may contribute to significant modifications and degradation of the benthic habitat. This would impair behavioral patterns in the sturgeon's life cycle, such as feeding and sheltering. The overall impacts to the sturgeon must be examined additively. From EPA’s perspective, a case can be made that they are sufficiently stressful such that the resultant conditions would significantly disrupt normal behavioral patterns to the extent of actual harassment. This matter should be discussed with USFWS for resolution. In summary, the preliminary, overall water quality assessment shows that adverse conditions already exist and will be exacerbated by the proposed deepening to the extent that recovery of the sturgeon will be diminished.

RESPONSE: The impact of the predicted DO decrease (due to the project deepening) on shortnose sturgeon cannot be forecast with any degree of certainty, and this for the following reasons: (1) Little is known about the DO requirements for the SNS's different life-stages; almost all knowledge has been garnered from laboratory research. (2) Estuaries are among the most stressful environments, where dynamic conditions prevail and where DO, during parts of the day, is often well below the 3 mg/l threshold for hypoxia. Numerous studies have shown that for many species that make use of estuaries intermittent hypoxia is vital to their survival strategies. The presence of SNS juveniles in the KITB during summer months suggests a tolerance to intermittent hypoxia, and that the 3.5 mg/l standard (derived from laboratory studies) that was adopted in this study, as a critical condition, may not reflect actual in situ tolerances. Furthermore, it must be stressed that of all portions of the Front River, the KITB is the one in the greatest state of disequilibrium. The presence of juveniles in this area is testimony to some level of opportunistic adaptation to disequilibrium conditions.

Despite the uncertainty of the effect of DO decrease in the KITB, the proposed project has taken a position of mitigating to avert any decrease in dissolved oxygen. Hence no adverse impact to shortnose sturgeon in the KITB is expected to occur. The project will take steps to:

(1) Preempt Impacts. The proposed deepening project will first and foremost seek to avoid, through mitigation, DO decreases that might cause adverse impacts to the SNS. A preliminary assessment of the feasibility of supplemental oxygenation, and other alternatives, such as advanced treatment to lower the oxygen demand in the River, have been considered at the conceptual level. These mitigation technologies are acceptable, mature and practicable and will be analyzed, in detail, in the next phase of the Study.

(2) Improve Habitat. The proposed project recommends that deep pockets be created in locations that are most likely to be favored by SNS during the summer month period. Given the uncertainty of responses to present conditions, and given the paucity of knowledge that we currently possess about the SNS's needs and habits the proposed habitat improvements are aimed at providing further assurances to the SNS's well-being. The proposal for deep pocket creation at Port Wentworth is subject to modification and improvement, upon discussion with agency and SNS specialists.

(3) Undertake Studies. Currently, no reliable database of the SNS population in the Savannah River exists. The current population dynamics in the Savannah River are not well known. The proposed project recommends funding a 5-year study that will develop such a database and will monitor the behavior of the SNS within the project areas. Hence, the study will also serve as a long-term control that would signal any future impacts and would thus create the basis for avoiding or stopping actions that pose a threat to the SNS.

In summary, the project proposes to avoid any decreases in DO that might have adverse impacts on SNS; to provide more habitat, and in the long run create a database for long term preservation efforts.

35. COMMENT: The BATES proposed a three-year monitoring program. Additional data from this study will augment existing information regarding recruitment, age distribution, telemetry and the relationship between species and water quality. Physical modifications will be undertaken to simulate conditions determined from the noted Collins et al. (1991). The monitoring may assist in documenting whether the demise of this sturgeon population is likely. Because this is critical information, it should have been developed and prepared prior to submission of this proposal.

RESPONSE: The project made use of existing information on all species of concern and studied the potential impact of the project on such species using standard criteria. Based on studies conducted during the DEIS phase, the potential adverse impacts to SNS were ascertained. The project will consider a 5-year monitoring study in order to (a) ascertain the effectiveness of the adopted DO mitigation strategy ; (b) evaluate strategies for habitat enhancement. To have proposed studies prior to having ascertained an impact would have been speculative and unreasonable.

36. COMMENT: Mitigation measures such as contouring the river bottom to create depressions (in areas identified prior to the latest channel modifications) which would function as refugia are intriguing, but untried. Moreover, were the hydraulic modifications resulting from these holes factored into the modeling calculations? If so, what were the specific results of their construction? Have any assessments been completed which indicate the longevity of these artificial holes? What can be done if there are unintended / unanticipated consequences, e.g., sediment fill prior to next maintenance? Has this type of ecosystem modification been successful in addressing essential parameters for any other fish species? As an absolute minimum, the risks associated with this "mitigation effort" need to be determined / balanced against potential upside value. Consensus among the principals should be obtained before implementation.

RESPONSE: Concur. The Port Wentworth deepening proposal is not mitigation for predicted adverse impacts from a decrease in DO. The project proposes to mitigate to avoid the effects of a DO decrease altogether. The proposal for the deepening of the Port Wentworth Turning Basin is a habitat improvement proposal that is contingent (a) upon the results of studies and (b) input from agency specialists and (c) would only be implemented with agency consensus. While recognizing that little knowledge presently exists for successful implementation of such habitat extension efforts, the proposal has been made on the assumption that greater knowledge for evaluation of such improvements may come into existence in the future as a result of the 5-year monitoring program and other proposed studies.

37. COMMENT: From an endangered species standpoint, SH should have been allowed to equilibrate after the recent dredging. Subsequent monitoring would have revealed how the juvenile sturgeon were affected by the altered water quality conditions. Unfortunately, this was not case. Had this been done there would have been, at least some suggestion as to whether adverse effects on juvenile sturgeon could be expected from this (similar) proposal. Without this information, the action agency is in a quandary as to actual effects. However, some implications can be drawn, i.e., the BATES points out that water quality tolerances of the sturgeon are already being exceeded. Interestingly, these adverse effects do not appear to have been considered with the previous EIS. Since this new information reveals adverse effects of the former action to an extent not previously considered, this may recreate a condition requiring the action agency to reinitiate formal consultation with the USFWS pursuant to (50 CFR 402.16(b)).

RESPONSE: The proposed project will take steps to avoid, through mitigation, DO decreases that would cause adverse impacts to the SNS. In addition the project will fund long-term studies to ascertain any potential adverse impacts to SNS and these studies will serve as early warning controls for avoiding or correcting any future impacts. The salinity exceedance reported in the BATES for the KITB is not absolute but on a time-duration pecentile basis.

38. COMMENT: Striped Bass populations will be affected in some fashion by the proposed “replumbing”, but this is insufficiently examined. The District is involved in a Section 1135 project which seeks to determine overall species viability, but the status of this effort is unknown to EPA. They understand that modeling was requested to address this uncertainty, but this work will not been completed. Without these data, evaluation of the sponsor's preferred alternative is unnecessarily delayed. EPA notes that observations made to date depict conditions which appear to place this species at risk from incremental salinity changes. Hence, decision-makers on this proposal must examine its impacts in a cumulative context as opposed to viewing the effects of each isolated incident.

RESPONSE: Prior to the development of the 3-D hydrodynamic model there was little possibility of isolating the factors that have had a cumulative impact on striped bass population dynamics. Using the model, the project will study cumulative impacts from large-scale effects, such as changes in salinity, as well as “marginal” but perhaps crucial impacts of topographical, velocity, and other hydrodynamic alterations. The aim of these model runs will be to (a) develop impact avoidance features, and (b) to assist in ongoing recovery efforts by evaluating the effects of previous modifications some of which may be inhibiting striped bass recovery.

Project Purpose / Need Considerations

39. COMMENT: EPA compared the purpose / need data in DEIS and the feasibility report (FR) with the environmental impacts of each incremental deepening option. There is a definite declination point at 46' which has a major bearing on both project purpose and the environmental impacts therefrom. They understand that commercial shipping has shown obvious trends to larger / deeper draft vessels. Improved access from the recent upgrades was among the reasons cited for important increases in containerized shipping at SH. Continuing this line of reasoning GPA avers that sustained future growth is contingent on having the capacity to service even larger, deeper draft ships (Post-Panamax Class). It has been EPA's experience that operators of commercial harbors throughout Region 4 routinely seek to gain a competitive edge over similar facilities via expedited access, improved shore side infrastructure, better / faster container facilities, etc..

RESPONSE: The Feasibility Report has been revised to include additional economic benefits, which will result in a NED plan of 48'.

40. COMMENT: Unfortunately, concomitant with these operational upgrades there are significant adverse environmental costs. The NEPA evaluation balances these conflicting issues such that a decision can be made as to whether the "improvements" are not just feasible, but in the overall public interest. As a result, the underlying reasoning for GPA's desire to increase SH navigation capabilities to 50' is not immediately clear. An examination of the numerous tables of shipping statistics in the FR reveals that by the year 2000 there will be only a very limited number of ships worldwide drawing more than 46'. It is uncertain that GPA could even access that market absent a present or anticipated contract arrangement. The notion that merely having deep-draft capacity secures deep-draft vessels is not a given. The cost:benefit ratio reflects this uncertainty. It is important to note that the NED selection of the Corps' analysis was NOT the recommended plan. Hence, EPA concludes that the economic benefits of deepening the harbor beyond 46' are uncertain while the environmental costs are dramatic.

RESPONSE: The Economic Appendix has been revised to support a NED and Recommended plan selection of a -48 foot project depth. GPA concurs with this selection and has selected the -48 foot project depth as the Locally Preferred Plan.

41. COMMENT: The economics of it particular project only concern EPA relative to the environmental costs which must be paid to realize this last increment of dollars. This has been a matter of repented discussion with the Savannah District; hence, they will not go into further detail other than to make the declaration that there appears to be very little increased incremental benefit from, or needed for, deepening the harbor beyond 46', while the environmental impacts of deepening beyond 46' feet considerable.

RESPONSE: The Economic Appendix has been revised to support a NED and Recommended plan selection of a -48 foot project depth. GPA concurs with this selection and has selected the -48 foot project depth as the Locally Preferred Plan.

Wetland Impacts/Mitigation

42. COMMENT: Various means are proposed to mitigate for wetland losses associated with this harbor upgrade. However, mitigation for previous environmental losses associated with upgrading SH are already behind agreed upon implementation schedules and/or are being adversely impacted by this action. From a resource standpoint this situation is perplexing. The local sponsor needs to understand that the lapse in securing necessary, permanent mitigation for previous actions actually increases the amount of mitigation ultimately necessary because temporal loss of wetland functions/values continue to accrue.

RESPONSE: To avoid delays in development and implementation of a mitigation plan, the mitigation process provided through the Continuing Engineering and Development (CED) phase will be drawn upon. The CED process provides for establishment of an advisory group consisting of the sponsor, resource agencies, and other stakeholders. The advisory group will establish a consensus regarding the magnitude of project impacts and the type and amount of mitigation that would be appropriate and provide input in development of a mitigation plan (including a search for sites and determining design criteria). The mitigation plan, as approved through the CED process, will be implemented in conjunction with the overall harbor project. The CED process will provide a comprehensive forum in which to address the myriad issues regarding appropriate mitigation for the Savannah Harbor project.

43. COMMENT: The compensatory mitigation information that has been supplied in the DEIS is incomplete. As a working premise, EPA suggests that the "Guidelines on the Establishment and Operation of Mitigation Banks in Georgia" be used as a format. This will first necessitate preparation of the field data worksheets and/or summaries of major/significant parameters and their inclusion in the FEIS for evaluation. For the proposed wetland creation, EPA would like to know what type(s) of wetlands will be created, where, how, etc. Other pertinent questions would logically follow. For example, what is the current condition of the land proposed for mitigation? Will the impacts at Steamboat Cut essentially plug the Steamboat River oxbow? If so, how can mitigation occur within the impact area? With respect to the plugging of the oxbow, etc. has there been any analysis of the impact on river flows or impairment of habitat due to changes in sedimentation?

RESPONSE: The specifics of the mitigation plan will be developed through the CED process. This process will include incremental analysis for salt marsh mitigation.

44. COMMENT: The overall wetland impacts resulting from project implementation and/or operation also need to be more precisely described. The DEIS does not provide enough information to evaluate the project's potential wetland impacts. The location of ALL anticipated direct/indirect project impacts should be presented on a location map along with a tabular representation of these wetland impacts by type. The present organization of the draft EIS makes it difficult to track what impacts will be occurring where. It is clear that for all deepening alternatives approximately 40 acres of wetlands will receive "direct" impacts. "Secondary" impacts due to the conversion of tidally-influenced freshwater wetlands to saltwater wetlands increase with the depth of harbor deepening. At the 46' depth, the secondary impacts are in the range of 45 acres whereas for GPA's preferred alternative, the secondary impacts could affect an area as great as 1170 acres. As previously noted, this is a significant increase in adverse environmental impacts for a potentially modest increase in potential economic benefits.

RESPONSE: It needs to be emphasized that the harbor deepening project will only result in approximately 6 acres of direct wetland impact. The remaining 34 acres of impact are related to the redredging of New Cut in an effort to avoid salinity impacts. These issues will be comprehensively addressed during the CED process.

45. COMMENT: For the 40 acres of "indirect" wetland impacts, GPA proposes creation of 80 acres of saltwater wetlands from the closure of an oxbow in the Steamboat River. EPA had difficulty finding any maps in DEIS that specifically denote the location of this mitigation site. Moreover, there was no information on the oxbow's current environmental value. This information needs to be added in the revised document. EPA also recommends that wetland creation, as compensatory mitigation, be provided at a minimum 3:1 ratio of mitigation acreage to impact acreage. Thus, 80 acres would he inadequate. Furthermore, 20 acres of the proposed impacts are from reopening New Cut, a site filled and revegetated to mitigate for a recent harbor upgrade. The logic of this design needs to be much more thoroughly evaluated in the revised document. At the very least, the subject proposal would require additional mitigation not subject to future unilateral deletion/modification by GPA.

RESPONSE: It needs to be emphasized that the harbor deepening project will only result in approximately 6 acres of direct wetland impact. The remaining 34 acres of impact are related to the redredging of New Cut in an effort to avoid salinity impacts. These issues will be comprehensively addressed during the CED process.

46. COMMENT: Potentially 1170 acres of highly productive, relatively scarce tidally influenced freshwater wetlands will be stressed by elevated salinities. It is probable that much of this area will convert to more abundant saltwater wetlands. To offset this conversion, GPA proposes to purchase/donate approximately 3000 acres of freshwater wetlands (ca. 5:1 ratio of preservation to anticipated/calculated impact area) to
the Savannah NWR. Historically EPA has had reservations to the use of preservation as a compensatory mitigation means since its it is so difficult to ensure that there will he no long-term, overall "net-loss" of wetland functions.

RESPONSE: Please see the response to comment #4 regarding potential impacts to the 1,170 acre zone. These issues will be comprehensively addressed during the CED process.

47. COMMENT: There needs to be up-to-date supporting documentation to substantiate the claim that a maximum 50% decrease in functionality of the 1170 acres of intertidal marsh will occur as a result of the project. Any calculations should rely on updated salinity information, etc. The calculation of mitigation for these impacts should be consistent with the other mitigation calculations, and analyzed at both the site-specific and landscape levels.

RESPONSE: The 50 percent figure regarding decrease in functionality of the 1,170 acre zone as a result of salinity impacts was determined in coordination with the resource agencies and the ACOE. The 50 percent figure was felt to represent a conservative worst-case scenario. This issue will be more fully discussed as part of the CED process.

48. COMMENT: The type(s)/location(s) of land which will be acquired for the Refuge need to be made known along with discussion about the long-term funding for appropriate management of this land. If this property in unknown, this should be made clear in the final EIS. As you are probably aware, in SC the Interagency Mitigation Banking Review Team prefers that mitigation credit not be given to areas where there are other options for acquiring, restoring or enhancing the land. The same logic is indicated in the national guidance.

RESPONSE: These issues will be comprehensively addressed during the CED process.

49. COMMENT: If any of the subject 1170 acres impacted by this project were anticipated to revert to fresh tidal marsh, this should be clarified. This would have particular relevance if they provided any mitigation credit for a previous expansion. As noted previously, this is it very complicated undertaking with many long-term ramifications.

RESPONSE: The impact to the subject 1,170 acres considers the loss of future benefit from the previous actions to reduce salinity levels in the SNWR and provide more fresh water marsh.

50. COMMENT: In those instances where preservation has been accepted, a ratio of at least 10:1 is more common and only for proposed mitigation areas which are at immediate threat of (land use) conversion. Unless it can be demonstrated that these acquired properties meet the latter test, the fact that they may be listed in the SNWR acquisition list is moot. Where this is not the case, EPA recommends that another form of compensatory mitigation (wetland restoration, enhancement, or creation) be investigated. These measures would form the core of functional restoration and could be combined with the noted wetland preservation. EPA intends to conduct a site inspection of the impacted areas in the immediate future to evaluate the entire subject area.

RESPONSE: These issues will be comprehensively addressed during the CED process.

51. COMMENT: The "impact avoidance option" documentation for closure of Middle River from Front River and reopening New Cut needs to be provided, together with salinity, documentation, and current effects on wetlands in the Front River. How will sedimentation, and currents be affected in the Middle and Back Rivers if this "replumbing" occurs? Similarly, what are the projected changes (if any) for maintenance material which must be dredged? The three locations at which the Middle River will be cut off from the Front River need to be included in the wetland map and accompanying table(s) along with a characterization of their present condition/environmental values.

RESPONSE: The EIS will be revised to include additional modeling results which present the predicted salinity changes for the Middle River closure avoidance feature under various flow conditions. The result of the Middle River closure modeling indicates that salinity impacts would be avoided in the Middle and Back Rivers with some increase of salinity levels in the Front River. The EIS will be revised to include additional studies which will address the concerns noted and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

52. COMMENT: The proposed bend wideners would have direct wetland impacts at six locations. The information that is presented with respect to the "daylight line" and the "sloughing casement" and the manner in which the encroachment areas were calculated needs to be explained more effectively.

RESPONSE: Both the “daylight line” and the “sloughing easement” were determined by the design engineers and depicted on engineering drawings. These lines were digitized in AutoCAD and overlain on a wetland line digitized from aerial photographs. Any wetland acreage extending waterward of the “sloughing easement” was considered a direct impact.

53. COMMENT: According to the DEIS, wetland impacts within the existing sloughing casement were conceptually addressed with the previous channel improvement project. In turn, these impacts were eventually compensated via construction of the wetland creation (10 acres) project within the former New Cut. Therefore, the mitigation requirements associated with wetland habitat lost attendant to reopening New Cut are not as straightforward n some other project resource consequences.

RESPONSE: We have included any loss of marsh at New Cut in the impact totals and will provide appropriate mitigation for it. These issues will be comprehensively addressed during the CED process.

Groundwater Impacts

54. COMMENT: It was noted that the potential for contamination of the Floridan aquifer from the increased channel depths is unlikely. EPA agrees that the preliminary data support this conclusion. However, it would be helpful if the FEIS had some exposition regarding the measures that could be implemented if contamination were to occur. The increasing chloride content of Savannah's water may not be legally compensable, but it appears to be posing a problem to some of the industrial users. EPA looks forward with interest to the results of the forthcoming report on this matter.

RESPONSE: The concern from the City of Savannah is related to a potential increase in chlorides at their surface water intake, which is addressed in the EIS.

Project Design

55. COMMENT: The channel prism will retain its lateral dimensions and side wall configuration with only centerline depths altered. This was done in the interest of lessening environmental impacts. EPA concurs with this objective. However, whether the channel will stabilize without significant amounts of bank slumping and adjacent wetland loss remain to be seen. This goal seems to be most dependent on the intrinsic stability of the new work material being excavated, long-term effects of wake turbulence produced by deep-draft vessel passage, and impacts of usual/unusual episodes of currents. None of these parameters has been fully evaluated in the DEIS.

RESPONSE: The preliminary channel design proposed in the EIS was based on engineering evaluations presented in the Engineering Appendix of the Feasibility Report.

56. COMMENT: As EPA noted in its review of the last deepening, the shore side ramifications of this action, viz., terminals, utility infrastructure, transportation access, are important and need to be assessed to determine their significance. This is true notwithstanding efforts to moderate many of these effects by yet untested / high risk mitigation.

RESPONSE: The final mitigation plan will be developed in the CED phase after further studies have been completed.

Preliminary Observations - Section 103 Concerns

57. COMMENT: There needs to be a more precise depiction / discussion of the sediment sampling locations in relation to the project alternatives / reaches. EPA noted the many references to various locations, station numbers, reaches, and reference points, but they are not consistently marked on any of the maps provided. Additionally, there does not appear to be any explanation or reference chart for the individual samples used to make up composite samples for chemical analyses. Without such a reference, results from composited samples cannot be correlated to specific project reaches and disposal alternatives. EPA would like to see a project map showing all sampling locations, project reaches, Corps navigational station identifications, and disposal alternatives for each project segment. EPA would also like to see a chart indicating which samples contributed to each composite sample, including identification of the portion of each core sample that contributed to the “New Work” or "O&M" or "Widener" composites.

RESPONSE: Maps providing sample locations in state plane coordinates are provided behind the text in the DMEEE and are repeated in the Laboratory and Geotechnical Appendix. All of the summary tables in the DMEEE are arranged by Reach and parameter class. The composition of the composite samples is summarized in tables in the SAP. The DMEEE Appendix also provides core logs that indicate the point of division (by elevation) between the New Work and O&M sample in the channel cores. For the widener cores, all of the material was considered New Work.

ACTION: ATM will attempt to clarify these issues when preparing the revised DMEEE. Specifically, a table similar to the one provided in the SAP indicating the composition of the composite samples will be prepared. This table will also incorporate the “identification of the portion of each core sample that contributed to the ‘New Work’ or ‘O&M’ or ‘Widener’ composites” from the geotechnical logs. The project maps provided in the DMEEE appear to us be consistent and sufficient. Please provide additional comments on how these can be improved and revised drawings will also be included in the revised DMEEE document.

58. COMMENT: Procedurally a concurrence for ocean disposal cannot be based on the filing of a DEIS. The process starts with it formal request (addressed to the EPA, Wetlands, Coastal, and Water Quality Branch when a final project exists) for review of the MPRSA Section 103 Evaluation and associated supporting documentations, and for EPA concurrence with the USCOE determination that the material is suitable for ocean disposal in accordance with 40 CFR Sections 220-228. EPA has 45 days to either respond to the request for concurrence, request an extensions or request additional information. The MOU between the CESAD and EPA Region 4, and the Ocean Dumping Regulations require full and direct coordination between Corps and EPA for all ocean disposal projects. The coordination between the appropriate departments of these two agencies must be conducted independent of the review and comment on the DEIS.

RESPONSE: The USCOE made a written request to EPA to provide a review of the MPRSA Section 103 Evaluation and associated supporting documentations, and for EPA to provide concurrence with the USCOE determination that the material is suitable for ocean disposal at the start of the public comment period.

59. COMMENT: Based on the information provided and reviewed to date, it appears that the material proposed in the preferred alternative may not be suitable for ocean disposal. Furthermore, the material proposed for upland disposal may pose a serious threat to aquatic organisms and wildlife, and the effluent from the CDFs may not comply with State WQS. This assessment is based on potentially elevated levels of tributyltin, cadmium, and various metals, PARS, and dioxins, and the fact that EPA has not had sufficient time to complete its review and to check all theoretical calculations and model outputs. Tributyltin values appear to range from 2,311 ug TBT/kg OC to 51,560 ug TBT/kg OC in samples taken for this project. The EPA draft proposed chronic water quality criterion for TBT is associated with a sediment concentration of 251 ug TBT/kg OC based on equilibrium partitioning. The 18th percentile for chronic effects is 1,255 ug TBT/kg OC, and the 112nd percentile for chronic effects/15th percentile for acute effects is 17,570 ug TBT/kg OC. Additional testing will be required to assess the potential for adverse effects due to high levels of tributyltin in a number of samples taken throughout the proposed project area.

RESPONSE: The DMEEE utilized conservative and up-to-date USEPA and USACE procedures to evaluate the water column effects for the proposed alternative. The results indicate that the discharges will be in compliance with Section 404 and Section 103. We concur that further testing and evaluation for TBT is prudent, but the TBT compounds are not primarily associated with the expansion project sediments, but the existing O&M material that is continually be excavated and disposed of according to existing project approvals. Executing any of the deepening proposals can only serve to attenuate any effects on benthic or terrestrial life by dilution.

60. COMMENT: In summary, if the results of the requested additional testing reveal ecological impacts due to contaminants in the proposed dredged material, this could result in the material from some portions of the project being classified as unsuitable for ocean disposal. By extension this would prevent EPA from concurring with a Corps determination of suitability for ocean disposal. Since this would have such fundamental ramifications for the project, details of future testing requirements and the results therefrom should be coordinated directly with Mr. Doug Johnson (EPA) to avoid any unnecessary delays.

RESPONSE: The DMEEE utilized conservative and up-to-date USEPA and USACE procedures to evaluate the water column effects for the proposed alternative. The results indicate that the discharges will be in compliance with Section 404 and Section 103. We concur that further testing and evaluation for TBT is prudent, but the TBT compounds are not primarily associated with the expansion project sediments, but the existing O&M material that is continually be excavated and disposed of according to existing project approvals. Executing any of the deepening proposals can only serve to attenuate any effects on benthic or terrestrial life by dilution.

Water Quality Modeling

61. COMMENT: It is not clear from the text whether all of the modeling calculations recognized that cited channel depths would actually include significant amounts of over dredging/advanced maintenance. This introduction of error could have been a reason why modeling for previous upgrades underestimated and/or did not predict the trends in salinity/dissolved oxygen in the project area.

RESPONSE: All model projections are based upon pre- versus post-project design depth plus overdredge.

Savannah River Basin Watershed Project

62. COMMENT: Most of the above concerns regarding this SH proposal have already been identified by the Savannah River Basin Watershed (SRBW) Project stakeholders in its "Initial Assessment and Prioritization Report". Because of there is a great deal of overlap of interest/impact between the two activities, we suggest that GPA work closely with the SRBW group.

RESPONSE: The mitigation process described in the EIS will include participation by a stakeholders group in addressing these issues.

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

ER 98/367 JUN 11, 1998

Mr. William G. Bailey
District Engineer
U.S. Army Corps of Engineers, PD-E
Savannah District Office
P.0. Box 889
Savannah, Georgia 31402-0889

Dear Mr. Bailey:

This is in regard to the request for the Department of the Interior's comments on the Draft Environmental Impact Statement for the Savannah Harbor Expansion, Chatham County, Georgia and Jasper County, South Carolina.

This is to inform you that the Department will have comments, but will be unable to reply within the allotted time as we have just received your transmittal of sufficient copies to satisfy our intradepartmental needs. Please consider this letter as a request for an extension of time in which to comment.

Our comments should be available by mid-July, 1998.

Sincerely,

Terence N. Martin
Team Leader, Natural Resources
Management
Office of Environmental Policy
and Compliance

Letter response

Department of Interior

Office Of The Secretary
Washington, DC 20240

DATE: June 11, 1998

COMMENT: Request for an extension of the review period to mid-July, 1998.

RESPONSE: In a letter dated June 22, 1998, Savannah District granted an extension to this office until July 7, 1998.

OFFICE OF THE SECRETARY

OFFICE OF ENVIRONMENTAL POLICY AND COMPLIANCE
Richard B. Russell Federal Building
75 Spring Street, S.W.
Atlanta, Georgia 30303

July 10, 1998

ER-98/367

District Engineer
Savannah District Office
U. S. Army Corps of Engineers
ATTN: William G. Bailey
P.0. Box 889
Savannah, GA 31402-0889

Dear Sir:

The Department of the Interior has reviewed the Draft EIS for the Savannah Harbor Expansion, Chatham County, GA, and Jasper County, SC, as requested. Our coordinated Departmental comments are enclosed.

Thank you for the opportunity to comment. If there are questions about this response, please give me at call at 404/331-4524. Questions directly related to fish and wildlife resources may be directed to Bruce Bell at 404/679-7089.

Sincerely,

James H. Lee
Regional Environmental Officer

Enclosure

Letter response

COMMENTS REGARDING SAVANNAH HARBOR EXPANSION PROJECT

ER-98/367

General DEIS Comments

The primary goal of this proposal is to modify the North Channel of the Savannah River to accommodate larger ships by increasing the depth of the channel from -42 foot mean low water (MLW) to -50 foot MLW. While the depth of the shipping lane would increase, its width would remain the same. The existing side slopes would be extended further toward the center of the channel. Bend-wideners would be added in twelve locations along the river where there is difficulty in maneuvering large vessels. These measures were proposed in order to minimize disturbance to existing channel banks and adjacent lands.

We believe the statement omits significant information needed to fully evaluate environmental impacts of the proposed project. In November 1997, the Fish and Wildlife Service (FWS) recommended the hydrodynamic (salinity) model be run at the two, four, six, and eight foot alternatives so environmental impacts of each alternative could be properly evaluated. Georgia Ports Authority (GPA) decided to run the model at only the eight foot alternative even though engineering and economic analyses were performed at two foot intervals. We believe the lack of model results on salinity and dissolved oxygen impacts for the two, four, and six foot alternatives make it impossible to conduct an informed alternatives analysis. Georgia Ports Authority believes water quality impacts of deepening are linear but no data presented support that assumption.

In February 1998, the FWS recommended additional model runs targeted toward mitigation evaluation analysis be completed prior to determining all the features of the selected alternative. Subsequently, specific recommendations on model runs needed for analysis of mitigation alternatives were provided to GPA. To date, recommended model runs have not been completed. The resulting lack of information makes correct formulation and evaluation of mitigation alternatives impossible. Specifically, we are concerned that predicted salinity increases may preclude restoration of the lower Savannah River striped bass population by decreasing the small amount of remaining suitable habitat. Mitigation model runs for Back River restoration need to be performed prior to determination of the selected alternative. With this data, the FWS could estimate the impacts of harbor deepening in conjunction with restoration/mitigation efforts. By doing so, we could assess overall impacts to striped bass habitat.

Based on model data provided in the preliminary DEIS, we believe projected salinity increases in the lower Savannah River system will adversely impact fish and wildlife resources. Moderate incremental increases in the salinity level have become cumulatively significant as depth of the harbor has been repetitively increased over time.

Potential impacts of the proposed deepening project must be considered in the context of these cumulative salinity impacts. Model results and analysis of existing data indicate harbor deepening would cause significant salinity incursion upstream in the Front River and Middle River, further adversely impacting Savannah National Wildlife Refuge. An increased salinity level would adversely impact freshwater wetlands and striped bass habitat on and near Savannah National Wildlife Refuge.

Tidal fresh marsh on Savannah NWR supports an extremely diverse plant community providing food, cover and nesting habitat for a wide variety of wildlife species. Tidal freshwater marsh is relatively scarce in comparison to coastal brackish and salt marshes. Because of this scarcity and its high fish and wildlife value, a primary FWS goal is to restore and maintain tidal freshwater marsh in the lower Savannah River. Past harbor modifications, including deepening, have greatly increased salinity levels throughout much of Savannah NWR and reduced the quantity of tidal freshwater marsh. Savannah NWR contained about 6,000 acres of tidal freshwater marsh when established in 1927. By 1997, due to the cumulative impacts of harbor deepening, tidal freshwater marsh had declined to 2,800 acres, a reduction of 53 percent. Based on the DEIS projected location of the 0.5 ppt salinity contour at a flow of 8,200 cfs, after harbor deepening, the refuge would support about 1,630 acres of tidal freshwater marsh. Therefore after the proposed project, only a remnant (27 percent) of the original tidal freshwater marsh would exist.

Restoration of striped bass spawning and nursery habitat to support a self-sustaining Savannah River striped bass population is another primary FWS goal. Prior to 1977, the Savannah River supported the most important striped bass population in the State of Georgia. Production of striped bass eggs in the Savannah River estuary has declined by about 95 percent since that time. Tide gate operation, in conjunction with the cumulative impacts of harbor deepening, caused a number of impacts, including increased salinity and loss of suitable spawning habitat throughout most of Little Back River and the lower Savannah River. Striped bass eggs and larvae were also transported through New Cut and then rapidly downstream to areas with toxic salinity levels. It was hoped the tide gate restoration project would improve conditions. Unfortunately, in spite of supplemental stocking and an increase in adult numbers, the striped bass population has not recovered as anticipated. The failure of recovery may be due, in part, to the cumulative impacts of harbor deepening. We believe that the salinity increases predicted by the model would preclude restoration of the lower Savannah River striped bass population.

Based on existing data and model predictions, low flow (less than 6,000 cfs) salinity would be eight to nine ppt in the Front River between river miles 21.5 and 24 and would be between five and eight ppt in the Middle River between river miles 22 and 24. We expect these predicted levels to be higher when the model is properly calibrated. This salinity level would be high enough to kill cypress and hardwood tree species common in the tidal forested wetlands, especially when the influence of storm surges is considered.

Studies in Wilmington, North Carolina have documented the degradation of tidal forested wetlands due to salinity increases and water level changes associated with navigation channel deepening. In Wilmington, much of the forested wetland was converted to brackish marsh.

Shortnose sturgeon habitat would also be adversely affected by the project. In the past, shortnose sturgeon, which is an endangered species under jurisdiction of the National Marine Fisheries Service, have used the Kings Island Turning Basin as nursery and foraging habitat. Currently, dissolved oxygen levels in this area are frequently marginal to support this species. The predicted decrease in dissolved oxygen will result in degradation and possibly loss of this habitat. In addition, Savannah Harbor dissolved oxygen levels are frequently lower than the level needed to support a healthy aquatic community, The proposed project will further depress the existing low dissolved oxygen level.

It does not appear that water quality at Fort Pulaski National Monument (FOPU) would be affected by the expansion project. Because FOPU is located in a saltwater water environment near the entrance to the river, salinity and dissolved oxygen levels would not change significantly by increasing the depth of the channel. Since studies have been conducted that indicate that dredging would have to exceed -100 feet MLW to impact either the Miocene or Florida aquifers, the proposed project should not have an impact upon the monument's potable water supply.

The DEIS does not adequately characterize the potential risk to fish and wildlife of exposure to contaminants in the dredged material during dredging activities or after placement of the material in a designated disposal area. Data from many of the analyses proposed in the Sampling and Analysis Plan were not conducted or presented in the DEIS. Also, the inappropriate use of ecological risk assessment tools throughout the project documents makes the interpretations of the data presented in the DEIS inaccurate and misleading. The sediment and elutriate analyses presented show the presence of certain contaminants at levels associated with deleterious ecological impacts in all reaches proposed for dredging. Disturbance of sediments during dredging activities may liberate sediment-bound contaminants into the water column where they would be more biologically available to aquatic species. In addition, the presence of elevated contaminant concentrations in elutriate samples suggest that drainage from disposal areas may impact habitat quality in the receiving wetlands. Fish and wildlife utilization of the proposed upland disposal areas was underestimated resulting in an inaccurate assessment of potential wildlife exposure and risk due to the contaminants present in the dredged material. Alternatively, placement of certain material in the ocean dredged material disposal site may lead to further water quality impacts that may be detrimental to aquatic organisms. These concerns should be addressed before the plan is finalized and sent to Congress for approval. By letter of June 23, the FWS's Charleston Office provided a detailed planning aid letter regarding potential contaminant impacts.

The DEIS recognized that stream bank and ship-wake generated erosion is currently an ongoing problem on the channelward side of FOPU monument property. However, there was no discussion on what additional stream bank erosion problems can be expected to occur as a result of allowing even larger ships to use the channel as a result of the expansion project. Approximately one half mile of the shoreline within FOPU has already been armored by riprap in an effort to reduce the erosion process. Any additional armoring would be undesirable.

The primary recommended mitigation measure, closure of Middle River, is a major modification of the lower Savannah River. No model results are provided to evaluate the hydrodynamic impacts of the proposed closure. We believe Middle River closure is a high risk mitigation measure that could cause significant adverse impacts. We are concerned the plan would simply shift the salinity problem further up Front River, perhaps as far as McCoys Cut, and into Back River and Middle River. This action could also cause adverse changes in water level, sedimentation rate, current velocity and fish and wildlife movement in Back River and Middle River.

Specific DEIS Comments

Section 1 page 6. Contrary to data presented in the last paragraph, studies are available that indicate a gradual return to tidal freshwater marsh following tide gate removal (Latham and Kitchens 1996). If properly interpreted, vegetation data from the DEIS corroborates this trend. By planning aid letter of June 22, the FWS provided the Savannah District an "Evaluation of the Ecological Study" which included a detailed vegetation data analysis and supports the hypothesis that freshwater marsh is recovering.

Section 3 page 1. The feasibility of closing off Middle River has not been established. While this action would reduce salinity intrusion in Middle River, it would also increase salinity intrusion in Front River. Impacts to tidal freshwater marsh would simply be shifted from Middle River to Front River. Much of the striped bass reproduction that remains occurs in Front River. How much reproduction will recover in Back River is unclear. Because this proposal would increase salinity in Front River, it could exacerbate impacts to striped bass habitat under current conditions. This action could also cause adverse changes in water level, sedimentation rate, current velocity and fish and wildlife movement in Back River and Middle River and water quality at the City of Savannah water intake.

Section 4 pages 7-28. Differences in interstitial salinities in the marshes vs. water column salinities in the rivers have not been thoroughly discussed. If most of the sampling was done in main channels, how can extensions of baseline conditions be made to inner areas and secondary channels if these areas were not sampled? In the 1986-88 study, the marsh soil salinities reflected average high-tide channel salinities with the tide gate in operation. This was confirmed with concurrent sampling of water column salinities in the channels and interstitial marsh salinities.

What kind of baseline project description of salinities can be made if the interstitial salinities were not sampled with channel water column salinities in 1997? Although the salinity model uses high tide condition to represent the marsh flooding period, the temporal extent of the salinity levels is not addressed in their description of current conditions, and the model grid does not extend beyond the main river channels, so predictions of changes to the baseline marsh levels (in sediments, outside of canals) may not be accurate.

In the 1986-88 study, marsh water salinity levels frequently exceeded river levels due to the marsh sediments' capacity to hold water. It was reported that the marsh water levels probably fluctuated less than the river water levels (one foot vs. seven feet in 1986-88), and that the marsh stage was not well-related to the river stage, possibly due to the time required for tidal water to cross the surface (slowed by interference by vegetation, water storage and sediment absorption). Marsh sediments remained saturated even when channel water levels were low. Measurements made in 1997 at Marsh sample 04A demonstrates the site retains saline water on the surface longer than in water measured at the bottom of the USFWS dock (Figure 3-23). The salinity of the sediments would probably be a high average of the marsh surface water that is standing, entering, and leaving. Estimations from the 1986-88 studies predicted that marsh sediments above the Highway 17 bridge required 2 months to reach freshwater salinity levels once the tide gate was taken out of operation due to the long salinity retention properties of the sediments. Temporal and spatial relationships of these salinity levels need to be better defined so a more accurate assessment of potential impact to marsh vegetation can be made.

Section 4 page 43. The statement that, "In the Savannah River and its tributaries, salinities were found to be below the lethal limit threshold for striped bass eggs" is incorrect. Portions of the river are now and have always been above the "lethal limit." The areas referenced are the traditional spawning grounds, which although below lethal levels, received enough salt water input as to become unattractive to spawning adults.

Section 4 page 52. The document should use more current information on manatee numbers in the Savannah River. Georgia DNR and South Carolina DNR have recent additional information. Also contact should be made with the Manatee Coordinator, USFWS, Jacksonville, FL (904) 232-2580.

Section 4 page 62. The statement that the existing navigation project is having no unacceptable impacts on shortnose sturgeon or its habitat is not well supported. There has been only limited research on shortnose sturgeon in the Savannah River. The existing navigation project may be impacting shortnose sturgeon through impacts on dissolved oxygen levels and salinity. The latest surveys show the population is skewed toward older individuals, indicating the shortnose sturgeon population may be impacted by the current project.

Section 4 page 64. Flatwoods salamander is a federally proposed threatened species.

Section 4 page 77. Available data indicate a gradual return to tidal freshwater marsh following tide gate removal (Latham and Kitchens 1996). Analysis of remote sensing information in the DEIS and in earlier reports (Pearlstine et al 1990) indicates there has been a significant increase in the amount of tidal freshwater marsh and intermediate marsh since the tide gate was taken out of operation. If properly interpreted, vegetation data from the DEIS corroborates this trend. By planning aid letter of June 22, the FWS provided the Savannah District an "Evaluation of the Ecological Study" which included a detailed vegetation data analysis and supports the hypothesis that freshwater marsh is recovering.

Section 5 page 14. The wave model did not indicate significant erosion impacts. However, tidal currents may be more important in controlling beach erosion. Extending the entrance channel 25,000 feet may cause significant changes in coastal circulation patterns and tidal currents. This source of potential impact was evidently not investigated.

Section 5 page 16. The DEIS does not include modeling runs evaluating impacts of Middle River closure. The DEIS cannot be considered complete without this important information. Closure of Middle River is a major modification of the lower Savannah River. Modeling results are needed in the document to evaluate the positive and negative impacts of this alternative.

Section 5 pages 17-25. The model grid in Figure 4-1 indicates the model does not cover the entire marsh surface. The "land" boundary condition, therefore, seems somewhat arbitrary and may not permit assessment of affects across the marsh. Cells along the primary feeder creeks off the Front River, Middle River, and Back River, are discussed. However, movement of water through the marsh and its sediments, which would probably have the effects of longest duration on the marsh salinity levels and subsequently vegetation communities there, is not discussed. More documentation is needed to demonstrate that model predictions are really representative of the marsh system, not just the main channels and rivers.

Section 5 page 29. The document indicates the 90 percentile post project dissolved oxygen for about four river miles (RM 16.6-20.5) will be less than three (2.2-2.9) parts per million. The document should present minimum predicted dissolved oxygen levels at all river stations. The document should assess the impacts of low dissolved oxygen on the aquatic community because projected dissolved oxygen levels exceed lethal limits for some fish species.

Section 5 page 33. The primary spawning grounds no longer include, "RM 21 and above in the Back River." These areas are the traditional/historical spawning areas, but no longer host a significant amount of spawning activity. The citation for the statement concerning "young-of-the-year" is incorrect. It should be attributed to Wallin et al. 1995.

Development time of eggs has been estimated at 44 hrs. in the prevailing water temperatures of the Savannah River (Bayless 1972). This was mentioned in Section 4 and probably should be mentioned here as well (in addition to or instead of the stated 36-40 hrs).

The statement, "No eggs in the early stages of development were collected at sites where salinity exceeded 1.0 ppt." is misleading. There is no definition of, "early stage of development," and the cited report (Reinert et a]. 1996) describes capture of eggs in areas of salinity exceeding 1.0 ppt. The vast majority of eggs have been caught in areas where salinity was <1.0. Samples were always taken on the ebb tide, so salinities were approaching dally minimums at each station, which may bias this assessment. Eggs probably do occur at higher salinities. However, their occurrence does not invalidate ATM's choice of critical condition for spawning (1.0 ppt). We suggest that 9 ppt also be examined, as this level has been accepted as the critical limit for survival and development (Winger and Lasier 1994).

Section 5 page 36. Maximum salinities are mentioned briefly in these sections. This variable is of great value and should have been presented more completely and thoroughly. Brief exposures to high salinity may have detrimental effects on egg and larval survival, thus making the maximum salinity in any portion of river an important variable. The discussion of Front River, RM 21.7, does not agree with the table on page 5-35. The 1 ppt condition is met between 60-70% of the time, not 40%, and the 1 ppt condition at RM 20.5 is met 40-50% of the time, not 20% as is stated.

Section 5 page 38. The document states that the 1 ppt condition is exceeded at RM 24.4. Although this may be true, and might preclude spawning at this location, this station has been highly productive for egg capture. This means that spawning is occurring upriver of this station, and likely is not affected by salinity changes at that station. The greatest concern should not be the preclusion of spawning because of slightly higher salinity, but the fate of the eggs that are spawned. By increasing salinity at sites further downriver, rearing habitat is pushed farther upriver and probably reduced overall. The concern seems to be with preserving spawning habitat, which is admittedly a primary objective; however, increased egg production is meaningless if the eggs and larvae do not have a place to hatch and grow.

Section 5 page 39. Whether table 5-5 represents surface or bottom salinities is unclear. If the table represents bottom salinity, then changes in the Front River (RM 21.7 and 20.5) are on the order of 2-3 ppt in the 90th percentile. This is a significant change. Are these predictions for a well-mixed tide (i.e., the spring tide), when bottom conditions may be representative of conditions throughout the water column, or do they represent the stratified condition (i.e., the neap tide), when bottom conditions will be much saltier than conditions elsewhere in the water column? A presentation of surface conditions and bottom conditions would be appropriate.

Section 5 page 40. The change in the Front River 90" percentile is described as an increase of 0.2 ppt. This is incorrect. The tables indicate a change of 0.4 ppt.

Section 5 page 41. The statement, "The DO will be equal to or greater than the acceptable criterion 85 percent of the time as compared to 70 percent of the time in the existing condition" is wrong. Comparison of Tables 5-4 (p.38) and 4-6 (p.41) indicate no change in the 5.0 mg/l level of DO at this station. The critical dissolved oxygen condition is predicted to occur 70% of the time, same as the existing condition. The second statement about RM 14.5 also appears to be incorrect. None of the numbers in this statement correspond to the data presented in Table 4-6.

Section 5 page 42. Striped bass egg transport to areas of high salinity would be affected by the project. The document falls to present data on the movement of the lethal/toxic salinity level (9.0 ppt, Winger and Lasier 1994). Tracking of the 9.0 ppt halocline would be appropriate and necessary to demonstrate the reduction in available habitat for hatching and rearing. The current problem of transport to toxic areas may be exacerbated by this project and thus needs to be investigated more thoroughly.

Section 5 page 54. The assumption is made that compensatory wetlands will be constructed in Steamboat River in conjunction with Middle River closure. We believe that Middle River closure may cause adverse impacts in the Savannah River system. It is premature to propose construction of wetlands at this site. An alternate site needs to be identified.

Section 5 pages 54-57. Because one of the DEIS's conclusions was that no change has occurred in the marsh since tide gate removal, the impact of salinity increase was not considered significant. Available vegetative data indicate a gradual return to tidal freshwater marsh following tide gate removal (Latham and Kitchens 1996). Analysis of the remote sensing information in the DEIS and in earlier reports (Pearlstine et al 1990) indicates a significant increase in the amount of tidal freshwater marsh and intermediate marsh since the tide gate was taken out of operation. By planning aid letter of June 22, the FWS provided the Savannah District an "Evaluation of the Ecological Study" which included a detailed vegetation data analysis and supports the hypothesis that freshwater marsh is recovering. Although the species in this marsh demonstrate plasticity in their distributions to a range of salinities, a shift to a slightly more saline environment could cause shifts in the species distributions, dominance, and population densities, and a northward migration of the brackish-intermediate marsh and displacement or elimination of the freshwater marsh that has recovered since the tide gate was taken out of operation.

Section 5 page 63. The EIS states in part, "Stream bank and ship-wake generated erosion is an ongoing problem on the channelward side of monument property. The property's shoreline is located well outside the existing channel side slope. Since no bend wideners are proposed in this area, the proposed deepening project will have no effect upon this resource." FOPU lands are identified in the EIS as being adjacent to Stations (-2+OOOB to +8+000).

Impacts of the 12 proposed bend-wideners were described in the EIS on pages 66 to 69 of Section 5. However, we were unable to find a figure that illustrated the extent and location of these features in relation to their surroundings. One widener is described as being located between Stations 12+000 and 9+000. Since the area adjacent to FOPU was identified as being between -2+OOOB and 8+000, it would appear this development would be immediately up stream of the monument. If this is the case, potential impacts to the channelward side of FOPU need to be addressed.

Figure 4-7. Some of the columns in this table appear to be misplaced or the data appears to be incorrect. The table, as presented, shows a positive deepening impact to dissolved oxygen.

Specific Draft Feasibility Report Comments

Section 1 page 10. The Draft Economic Analysis completed in February 1998 indicated that the 46 foot depth was the NED plan while the Draft Feasibility report indicates the 47 foot depth is the NED plan. The reason for this change should be explained.

Section 1 page 13. The Natural Resources Mitigation plan is seriously flawed. Purchase of wetlands, without restoration or management improvement will have little value for mitigation. In addition, little tidal freshwater marsh remains in the Savannah River system outside the Savannah National Wildlife Refuge. The feasibility of closing off Middle River has not been established. While this action would reduce salinity intrusion in Middle River, it would also increase salinity intrusion in Front River. Impacts to tidal freshwater marsh would simply be shifted from Middle River to Front River. Much of the remaining striped bass reproduction occurs in the Front River. How much reproduction will recover in the Back River is unclear. Because this proposal would increase salinity in Front River it could exacerbate impacts to striped bass habitat under current conditions. This action could also cause adverse changes in water level, sedimentation rate, current velocity and fish and wildlife movement in Back River and Middle River.

Section 5 page 4. The document states that the inner harbor is not adequate for existing and projected larger vessels. However page 5-2 of the Draft Economics appendix states that the existing Port of Savannah is relatively comparable or advantaged to other ports in the south Atlantic. The latter statement either indicates the Port of Savannah is adequate at least for existing larger vessels or all south Atlantic ports are inadequate for existing larger vessels.

Section 5 page 13 and Draft Economics Appendix Page 3-6. The document indicates a projected year 50 throughput for Savannah of over six million TEUs which is more than the existing Port of Long Beach. Is this assumption valid given the respective size of the hinterland served and the potential to provide the necessary land side facilities? This is also about 10 times the existing throughput at Savannah.

The report should provide information on how much throughput existing container cranes and berths could accommodate. The report should also determine how many additional berths and cranes would be needed and their locations.

Section 5 page 42. Available vegetative data indicate a gradual return to tidal freshwater marsh following tide gate removal (Latham and Kitchens 1996). Analysis of the remote sensing information in the DEIS and in earlier reports (Pearistine et al 1990) indicates a significant increase in the amount of tidal freshwater marsh and intermediate marsh since the tide gate was taken out of operation. This indicates a significant recovery of tidal freshwater marsh since removal of the tide gate. By planning aid letter of June 22, the FWS provided the Savannah District an "Evaluation of the Ecological Study" which included a detailed vegetation data analysis and supports the hypothesis that freshwater marsh is recovering.

Shortnose sturgeon habitat would also be adversely affected by the project. In the past, shortnose sturgeon, which is an endangered species under jurisdiction of the National Marine Fisheries Service, have used the Kings Island Turning Basin as nursery and foraging habitat. Dissolved oxygen levels in this area under current conditions are frequently marginal to support this species. The predicted decrease in dissolved oxygen will result in degradation of the available habitat and possibly loss of this habitat. In addition, Savannah Harbor dissolved oxygen is frequently lower than the level needed to support a healthy aquatic community. The proposed project will further depress the existing low dissolved oxygen level.

Section 5 page 42. Section 7 page 27 and Section 9 page 4. The Natural Resources Mitigation plan is seriously flawed and the FWS does not support the proposed plan. The FWS has not agreed that details of the mitigation plan can be refined in the engineering and design phase. The FWS believes a mitigation plan must be completed prior to completion of the final feasibility report and Congressional authorization.

Summary Comments

The predicted increase in salinity and decrease in dissolved oxygen would cause unacceptable impacts to nationally important fish and wildlife resources. Because of the scarcity and high value of the freshwater habitat and past cumulative impacts, any salinity increases in Savannah National Wildlife Refuge need to be avoided. The project would eliminate 42 percent (1170 acres) of remaining tidal freshwater marsh in Savannah National Wildlife Refuge and only 27 percent of the original refuge tidal freshwater marsh would remain. It is also likely that restoration of the naturally reproducing population of striped bass in the lower Savannah River would be precluded. To date, no effective mitigation measures for salinity and dissolved oxygen impacts have been identified. The proposed closure of Middle River is a high risk alternative which may cause more harm than good. The FWS believes a mitigation plan must be completed prior to completion of the final feasibility report and congressional authorization.

If deep water port development is pursued in Savannah low risk mitigation alternatives, such as release of flows from upstream Corps reservoirs, that would restore freshwater habitat and avoid any further salinity increases in Savannah NWR should be considered.

We will continue to work toward an acceptable resolution of these unresolved issues. However, because of these serious impacts and deficiencies, we may refer this project to the Council on Environmental Quality under National Environmental Policy Act regulations (40 CFR, Section 1504).

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UNITED STATES DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
OFFICE OF ENVIRONMENTAL POLICY AND COMPLIANCE
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Date: July 10, 1998

General DEIS Comments

1. COMMENT: While the depth of the shipping lane would increase, its width would remain the same. The existing side slopes would be extended further toward the center of the channel. Bend-wideners would be added in twelve locations along the river where there is difficulty in maneuvering large vessels. These measures were proposed in order to minimize disturbance to existing channel banks and adjacent lands.

RESPONSE: Concur.

2. COMMENT: We believe the statement omits significant information needed to fully evaluate environmental impacts of the proposed project. In November 1997, the USFWS recommended the hydrodynamic (salinity) model be run at the two, four, six, and eight foot alternatives so environmental impacts of each alternative could be properly evaluated. GPA decided to run the model at only the eight foot alternative, even though engineering and economic analyses were performed at two foot intervals. We believe the lack of model results on salinity and DO impacts for the two, four, and six foot alternatives make it impossible to conduct an informed alternatives analysis. GPA believes water quality impacts of deepening are linear, but no data are presented support that assumption.

RESPONSE: The proposed scope of the DEIS was stated as a "worst case scenario" addressing the potential impacts of the deepest alternative, a 50 foot channel. All other alternative project depths would have less impact. Additional studies will be performed in the CED phase to evaluate alternative depths.

3. COMMENT: In February 1998, the USFWS recommended additional model runs targeted toward mitigation evaluation analysis be completed prior to determining all the features of the selected alternative. Subsequently, specific recommendations on model runs needed for analysis of mitigation alternatives were provided to GPA. To date, recommended model runs have not been completed. The resulting lack of information makes correct formulation and evaluation of mitigation alternatives impossible. Specifically, we are concerned that predicted salinity increases may preclude restoration of the lower Savannah River striped bass population by decreasing the small amount of remaining suitable habitat. Mitigation model runs for Back River restoration need to be performed prior to determination of the selected alternative. With this data, the USFWS could estimate the impacts of harbor deepening in conjunction with restoration / mitigation efforts. By doing so, we could assess overall impacts to striped bass habitat.

RESPONSE: The EIS will be revised to include additional modeling results which present the predicted salinity changes for the Middle River closure avoidance feature under various flow conditions. The result of the Middle River closure modeling indicates that salinity impacts would be avoided in the Middle and Back Rivers with some increase of salinity levels in the Front River. The EIS will be revised to include additional studies which will address the concerns noted and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

4. COMMENT: Based on model data provided in the preliminary DEIS, we believe projected salinity increases in the lower Savannah River system will adversely impact fish and wildlife resources. Moderate incremental increases in the salinity level have become cumulatively significant as depth of the harbor has been repetitively increased over time. Potential impacts of the proposed deepening project must be considered in the context of these cumulative salinity impacts. Model results and analysis of existing data indicate harbor deepening would cause significant salinity incursion upstream in the Front River and Middle River, further adversely impacting Savannah National Wildlife Refuge. An increased salinity level would adversely impact freshwater wetlands and striped bass habitat on and near the Savannah NWR.

RESPONSE: As part of the DEIS development the historic changes to the system from 1987 to the present were evaluated. This evaluation looked at the salinity changes which occurred due to the removal of the tide gate and the changes which occurred due to the last deepening. This study quantified where the system was in 1987 and other studies quantified where it would be after the proposed deepening. Along the Little Back River above the US17 bridge where some of the most critical freshwater habitats exist the salinities even after the proposed deepening would be far less than what existed in 1987. Along the Front River, the removal of the tide gate significantly altered the salinity regime such that on an average basis the salinity concentrations went down while the maximums increased. This meant that the system went from longer duration events above 0.5 ppt to shorter duration events with higher peaks.

The deepenings in comparison do cause salinities to be higher but these increases are small in comparison to the dramatic change caused by the tide gate. Any evaluation of changes in salinity caused by the proposed deepening must be examined in light of the dramatic changes which the removal of the tide gate created.

5. COMMENT: Tidal freshwater marsh on the Savannah NWR supports an extremely diverse plant community providing food, cover and nesting habitat for a wide variety of wildlife species. Tidal freshwater marsh is relatively scarce in comparison to coastal brackish and salt marshes. Because of this scarcity and its high fish and wildlife value, a primary USFWS goal is to restore and maintain tidal freshwater marsh in the lower Savannah River. Past harbor modifications, including deepening, have greatly increased salinity levels throughout much of Savannah NWR and reduced the quantity of tidal freshwater marsh. Savannah NWR contained about 6,000 acres of tidal freshwater marsh when established in 1927. By 1997, due to the cumulative impacts of harbor deepening, tidal freshwater marsh had declined to 2,800 acres, a reduction of 53 percent. Based on the DEIS projected location of the 0.5 ppt salinity contour at a flow of 8,200 cfs, after harbor deepening, the refuge would support about 1,630 acres of tidal freshwater marsh. Therefore after the proposed project, only a remnant (27 percent) of the original tidal freshwater marsh would exist.

RESPONSE: the surface salinity will be greater than 0.5 ppt. The other 50 percent of the time, the salinity will be less than 0.5 ppt. The 50 percentile salinity at 8,200 cfs was used as representative of an average condition that may be expected and was the subject of long discussion among the technical advisory group. While the 1,170 acre zone will be subject more frequently to salinities higher than 0.5 ppt, it is inappropriate to state that 1,170 acres of tidal freshwater marsh will be lost. Under various tide and river flow conditions, the area within the 1,170 acre zone certainly is already subjected to salinity levels above 0.5 ppt. The long-term effect the post-project change in salinity level frequency will have on the vegetative composition of the tidal freshwater marshes is a ripe subject for further study. Whatever the salinity effect may be, it is more likely to manifest itself as a subtle, long-term change than a conveniently quantifiable wholesale conversion of tidal freshwater marsh into an intermediate marsh. In addition, any changes in the marsh composition as a result of post-project induced salinity changes would occur against the backdrop of "natural" changes that would be occurring within the marshes even in the absence of the port project. Under no scenario would any tidal freshwater marsh be converted into saltwater marsh. In the next phase of the project it is proposed that the potential long-term effect of salinity values on marsh composition be more thoroughly studied. This study would include deployment of a network of salinity data loggers within the marsh and tidal channels to more precisely monitor the magnitude and variation of salinity values within the marshes. This study would be augmented with additional studies of other factors affecting marsh succession including substrate variability and water levels. These studies would be used to support development of a dynamic marsh succession model for use as a predictive and management tool.

6. COMMENT: Restoration of striped bass spawning and nursery habitat to support a self-sustaining Savannah River striped bass population is another primary USFWS goal. Prior to 1977, the Savannah River supported the most important striped bass population in GA. Production of striped bass eggs in the Savannah River estuary has declined by about 95 percent since that time. Tidegate operation, in conjunction with the cumulative impacts of harbor deepening, caused a number of impacts, including increased salinity and loss of suitable spawning habitat throughout most of Little Back River and the lower Savannah River. Striped bass eggs and larvae were also transported through New Cut and then rapidly downstream to areas with toxic salinity levels. It was hoped the Tidegate restoration project would improve conditions. Unfortunately, in spite of supplemental stocking and an increase in adult numbers, the striped bass population has not recovered as anticipated. The failure of recovery may be due, in part, to the cumulative impacts of harbor deepening. We believe that the salinity increases predicted by the model would preclude restoration of the lower Savannah River striped bass population.

RESPONSE: Egg transport studies on predicted future conditions, using additional model runs, will be discussed in the next phase of the DEIS. Although not required for the purposes of the EIS, the model could be used to examine existing factors and cumulative impacts that could be inhibiting restoration of striped bass population in the lower Savannah River.

7. COMMENT: Based on existing data and model predictions, low flow (less than 6,000 cfs) salinity would be eight to nine ppt in the Front River between river miles 21.5 and 24 and would be between five and eight ppt in the Middle River between river miles 22 and 24. We expect these predicted levels to be higher when the model is properly calibrated. This salinity level would be high enough to kill cypress and hardwood tree species common in the tidal forested wetlands, especially when the influence of storm surges is considered. Studies in Wilmington, NC have documented the degradation of tidal forested wetlands due to salinity increases and water level changes associated with navigation channel deepening. In Wilmington, much of the forested wetland was converted to brackish marsh.

RESPONSE: Salinity can have a substantial effect on the composition of forested wetlands. While salinity is undoubtedly a factor, the contribution of water levels in bringing about changes in wetland composition can not be discounted. Forested freshwater swamps can be very sensitive to even small changes in average water levels. Long-term monitoring of forested swamps in Florida have documented excessive tree-mortality as a result of increased water levels (Orange County, Florida Eastern Service Area). In addition, the Southwest Florida Water Management District (Brooksville, Florida) recently completed a study of tree mortality of the Flatford Swamp, a mixed hardwood forested wetland in Manatee County, south of Tampa. The conclusion of this study was that the tree mortality was caused by increased dry season water levels resulting from increased agricultural water use in the swamp's upper watershed.

In both these examples dramatic tree mortality was caused by changes in water levels, without any involvement of salinity. The potential influence of water level on tree mortality was mentioned in the ecological study in the DEIS in reference to tree mortality along the Middle River. This loss of trees is documented in historic aerial photography of the project area and generally coincides with the past channel alterations. The relative contribution of salinity and water levels in this episode of tree mortality remains unexplored. In the next phase of the project it is proposed that historic salinity and water levels be modeled to more fully examine this combination of potential factors in determination of wetland succession in the refuge. This study would include deployment of a network of water-level data loggers within the marsh and tidal channels to more precisely monitor the magnitude and variation of water levels within the marshes in relation to the tides of the main river channels. This water-level monitoring network would be deployed in conjunction with more thorough survey of marsh elevations using GPS survey equipment.

8. COMMENT: Shortnose sturgeon habitat would also be adversely affected by the project. In the past, shortnose sturgeon, which is an endangered species under jurisdiction of the NMFS, have used the KITB as nursery and foraging habitat. Currently, DO levels in this area are frequently marginal to support this species. The predicted decrease in DO will result in degradation and possibly loss of this habitat. In addition, Savannah Harbor DO levels are frequently lower than the level needed to support a healthy aquatic community. The proposed project will further depress the existing low DO level.

RESPONSE: The proposed project will take steps to avoid, through mitigation, DO decreases that would cause adverse impacts to the SNS. In addition the project will fund long-term studies to ascertain any potential adverse impacts to SNS and these studies will serve as early warning controls for avoiding or correcting any future impacts.

9. COMMENT: It does not appear that water quality at Fort Pulaski National Monument (FOPU) would be affected by the expansion project. Because FOPU is located in a saltwater water environment near the entrance to the river, salinity and DO levels would not change significantly by increasing the depth of the channel. Since studies have been conducted that indicate that dredging would have to exceed -100 feet MLW to impact either the Miocene or Florida aquifers, the proposed project should not have an impact upon the monument's potable water supply.

RESPONSE: Concur. No water quality impacts are expected at the Fort Pulaski National Monument.

10. COMMENT: The DEIS does not adequately characterize the potential risk to fish and wildlife of exposure to contaminants in the dredged material during dredging activities or after placement of the material in a designated disposal area. Data from many of the analyses proposed in the Sampling and Analysis Plan were not conducted or presented in the DEIS. Also, the inappropriate use of ecological risk assessment tools throughout the project documents makes the interpretations of the data presented in the DEIS inaccurate and misleading. The sediment and elutriate analyses presented show the presence of certain contaminants at levels associated with deleterious ecological impacts in all reaches proposed for dredging. Disturbance of sediments during dredging activities may liberate sediment-bound contaminants into the water column where they would be more biologically available to aquatic species. In addition, the presence of elevated contaminant concentrations in elutriate samples suggest that drainage from CDFs may impact habitat quality in the receiving wetlands. Fish and wildlife use of the proposed upland CDFs was underestimated, resulting in an inaccurate assessment of potential wildlife exposure and risk due to the contaminants present in the dredged material. Alternatively, placement of certain material in the ODMDS may lead to further water quality impacts that may be detrimental to aquatic organisms. These concerns should be addressed before the plan is finalized and sent to Congress for approval.

RESPONSE: Ecological risk assessment tools were used appropriately and according to the best available information at the time of analysis and writing. The proper use of such tools, their limitations, etc. was also discussed in the DMEEE document. While the "presence of certain contaminants at levels associated with deleterious ecological impacts" were found "in all reaches proposed for dredging," these levels did not indicate that deleterious effects are likely for the proposed dredging and placement. In fact the analysis showed that the material is unlikely to cause unacceptable adverse impacts to the affected environment. SQAGs are screening values and were derived using statistical tools to correlate effects data with bulk chemistry. An exceedance of a threshold effects level was used to flag an analyte for further evaluation. Further evaluation did not indicate a likelihood that the proposed dredged material would create unacceptable adverse effects. Further assurances are required concerning the Savannah RACON/Light site and the potential for cadmium exceeding the LPC at the ODMDS if the dredging is undertaken without the required additional study recommended by the GPA and USACE. In terms of the existing project maintenance material, further evaluation may provide assurances concerning TBT, but this has little impact on the incremental potential of the proposed project. Additionally, GPA has offered to provide a more rigorous analysis of the bioaccumulative impact potential of organic compounds on terrestrial wildlife using the CDFs for foraging habitat. The results will be incorporated into the DMEEE, but the relatively low contaminant concentrations reported in the representative samples are unlikely to create unacceptable adverse impacts to avian species foraging these areas.

SQAGs derived using the weight-of-evidence approach are important tools for dredged material effects evaluations, but they are not criteria and they have several limitations. These include the quality of the data in the set used to generate the SQAGs; the variability of sediment sizes; variability of organic carbon concentrations and other factors affecting bioavailability; differing laboratory procedures and analytical techniques; different biological endpoints; and regional variabilities. The recent studies cited in the DMEEE by Dr. Long and others (Long et al., 1998a; Long et al., 1998b) provide useful information for using the SQAGs for toxicity potential predictions. For example, in the study with over 77 samples that were chosen to reflect large metals gradients, 0% of the samples were toxic when all of the metals concentrations were less than the probable effects levels (ERM/PEL). In all the representative sediments analyzed for this project, only the cadmium concentration reported at the wreck site 14 miles into the ocean exceeded a probable effects level. (Special procedures or further testing was recommended for handling this small volume of dredged material.)

The Inland Testing Manual states that "[m]aterial resuspended during normal dredging operations is considered 'de minimus' and is not regulated under Section 404 as a dredged material discharge." In situations where the dredged material contains contaminants at such high levels that resuspension may result in unacceptable adverse impacts, the potential impact of resuspension due to dredging can be addressed under NEPA. The evaluation of the sediments proposed for excavation from the Savannah Harbor for deepening are predominantly virgin sediments with high metal concentrations that were determined to be non-toxic using the currently available methods (especially SQAGs; ERL/TEL and ERM/PEL values). Numerous studies conducted on the relatively more contaminated the Savannah Harbor berths have shown that resuspended sediments at high suspended solids concentrations (i.e., sediments resuspended by agitation) did not produce measurable toxic effects.

A thorough and extremely conservative water column effects evaluation was conducted for constituents remaining in the water column in the CDF return water. Extensive modified elutriate preparation procedures were used, "total" instead of the "dissolved" concentrations recommended in USEPA guidance documentation were calculated and compared to State and federal WQS/WQC as appropriate using an appropriate mixing model. All of the water column issues have been thoroughly addressed in the DMEEE; no further evaluation is necessary.

The DMEEE will be revised to appropriately consider terrestrial wildlife pathways from bioaccumulative contaminants of concern (BCCs). The analysis will make use of the most up-to-date USEPA and USACE Supplemental procedures for terrestrial pathways analysis. BCCs will be selected from the larger project contaminants list detailed in the SAP that have octanol/water coefficients of greater than 10,000 (log $K_{ow} > 4$). These chemicals tend to bioaccumulate up the food chain and may pose a threat to foraging birds using the CDFs. BCCs will first be screened against the lower sediment quality assessment guidelines (ERL or TEL values).

Theoretical bioaccumulation potentials (TBPs) will be calculated for the highest dw-normalized concentrations of BCCs exceeding threshold effects levels (MacDonald, 1994; Long et al., 1995) using an appropriate benthic organism for which biota-sediment accumulation factors (BSAFs) exist in the USACE database. TBPs will then be evaluated against FDA action levels for fish or shellfish (when available) according to procedures outlined in the ITM. For those BCCs remaining after screening, the theoretical benthic tissue toxin will be evaluated against a no observable effects food concentration calculated for an appropriate measurement endpoint.

11. COMMENT: The DEIS recognized that stream bank and ship-wake generated erosion is currently an ongoing problem on the channelward side of FOPU monument property. However, there was no discussion on what additional stream bank erosion problems can be expected to occur as a result of allowing even larger ships to use the channel as a result of the expansion project. Approximately one half mile of the shoreline within FOPU has already been armored by riprap in an effort to reduce the erosion process. Any additional armoring would be undesirable.

RESPONSE: There will be no requirement as a part of the deepening project to add riprap at FOPU.

12. COMMENT: The primary recommended mitigation measure, closure of Middle River, is a major modification of the lower Savannah River. No model results are provided to evaluate the hydrodynamic impacts of the proposed closure. We believe Middle River closure is a high-risk mitigation measure that could cause significant adverse impacts. We are concerned the plan would simply shift the salinity problem further up Front River, perhaps as far as McCoys Cut, and into Back River and Middle River. This action could also cause adverse changes in water level, sedimentation rate, current velocity and fish and wildlife movement in Back River and Middle River.

RESPONSE: The EIS will be revised to include additional modeling results which present the predicted salinity changes for the Middle River closure avoidance feature under various flow conditions. The result of the Middle River closure modeling indicates that salinity impacts would be avoided in the Middle and Back Rivers with some increase of salinity levels in the Front River. The EIS will be revised to include additional studies which will address the concerns noted and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

Specific DEIS Comments

13. COMMENT: Section 1 page 6. -- Contrary to data presented in the last paragraph, studies are available that indicate a gradual return to tidal freshwater marsh following Tidegate removal (Latham and Kitchens 1996). If properly interpreted, vegetation data from the DEIS corroborates this trend. By planning aid letter of June 22, the USFWS provided the Savannah District an "Evaluation of the Ecological Study" which included a detailed vegetation data analysis and supports the hypothesis that freshwater marsh is recovering.

RESPONSE: Please see Attachment A, Response to the Evaluation of the Ecological Report.

14. COMMENT: Section 3 page 1. -- The feasibility of closing off Middle River has not been established. While this action would reduce salinity intrusion in Middle River, it would also increase salinity intrusion in Front River. Impacts to tidal freshwater marsh would simply be shifted from Middle River to Front River. Much of the striped bass reproduction that remains occurs in Front River. How much reproduction will recover in Back River is unclear. Because this proposal would increase salinity in Front River, it could exacerbate impacts to striped bass habitat under current conditions. This action could also cause adverse changes in water level, sedimentation rate, current velocity and fish and wildlife movement in Back River and Middle River and water quality at the City of Savannah water intake.

RESPONSE: The EIS will be revised to include additional modeling results which present the predicted salinity changes for the Middle River closure avoidance feature under various flow conditions. The result of the Middle River closure modeling indicates that salinity impacts would be avoided in the Middle and Back Rivers with some increase of salinity levels in the Front River. The EIS will be revised to include additional studies which will address the concerns noted and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

15. COMMENT: Section 4 pages 7-28. -- Differences in interstitial salinities in the marshes vs. water column salinities in the rivers have not been thoroughly discussed. If most of the sampling was done in main channels, how can extensions of baseline conditions be made to inner areas and secondary channels if these areas were not sampled? In the 1986-88 study, the marsh soil salinities reflected average high-tide channel salinities with the Tidegate in operation. This was confirmed with concurrent sampling of water column salinities in the channels and interstitial marsh salinities. What kind of baseline project description of salinities can be made if the interstitial salinities were not sampled with channel water column salinities in 1997?

Although the salinity model uses high tide condition to represent the marsh flooding period, the temporal extent of the salinity levels is not addressed in their description of current conditions, and the model grid does not extend beyond the main river channels, so predictions of changes to the baseline marsh levels (in sediments, outside of canals) may not be accurate.

RESPONSE: The ecological study in the DEIS relied on the methodology in the previous study (Pearlstine et al., 1990) and assumed the marsh soil salinities were the average of the high tide salinities. Despite the use of this assumption, however, soil salinity readings were taken at 110 locations throughout the study area. These soil salinity values were used in conjunction with the river channel salinity values to determine the location of the salinity contours used in delineating the zone of potential affect. In the next phase of the project, the relationship of marsh soil salinity and the high tide salinity will be tested by the placement of salinity data loggers within the marshes and secondary creeks. This sample scheme will allow more precise data collection within the marshes and a more robust analysis of correlation with high tide conditions in the main channels.

16. COMMENT: Section 4 pages 7-28. -- In the 1986-88 study, marsh water salinity levels frequently exceeded river levels due to the marsh sediments' capacity to hold water. It was reported that the marsh water levels probably fluctuated less than the river water levels (one foot vs. seven feet in 1986-88), and that the marsh stage was not well-related to the river stage, possibly due to the time required for tidal water to cross the surface (slowed by interference by vegetation, water storage and sediment absorption). Marsh sediments remained saturated even when channel water levels were low. Measurements made in 1997 at Marsh sample 04A demonstrates the site retains saline water on the surface longer than in water measured at the bottom of the USFWS dock. The salinity of the sediments would probably be a high average of the marsh surface water that is standing, entering, and leaving. Estimations from the 1986-88 studies predicted that marsh sediments above the Highway 17 bridge required 2 months to reach freshwater salinity levels once the Tidegate was taken out of operation due to the long salinity retention properties of the sediments. Temporal and spatial relationships of these salinity levels need to be better defined so a more accurate assessment of potential impact to marsh vegetation can be made.

RESPONSE: In the next phase of the project, it is proposed that a salinity sampling scheme be installed within the marshes to more precisely correlate the relationship of soil salinity to marsh water column and river channel salinity levels.

17. COMMENT: Section 4 page 43. -- The statement that, "In the Savannah River and its tributaries, salinities were found to be below the lethal limit threshold for striped bass eggs" is incorrect. Portions of the river are now and have always been above the "lethal limit." The areas referenced are the traditional spawning grounds, which although below lethal levels, received enough salt water input as to become unattractive to spawning adults.

RESPONSE: Concur. The statement will be removed.

18. COMMENT: Section 4 page 52. -- The document should use more current information on manatee numbers in the Savannah River. GADNR and SCDNR have recent additional information.

RESPONSE: The document has been revised using current manatee sighting data received from Georgia DNR. Contact has been established with the Manatee Coordinator, Robert Turner (USFWS), so that the data set will be kept current.

19. COMMENT: Section 4 page 62. -- The statement that the existing navigation project is having no unacceptable impacts on shortnose sturgeon or its habitat is not well supported. There has been only limited research on shortnose sturgeon in the Savannah River. The existing navigation project may be impacting shortnose sturgeon through impacts on DO levels and salinity. The latest surveys show the population is skewed toward older individuals, indicating the shortnose sturgeon population may be impacted by the current project.

RESPONSE: The proposed project will take steps to avoid, through mitigation, DO decreases that would cause adverse impacts to the SNS. In addition the project will fund long-term studies to ascertain any potential adverse impacts to SNS and these studies will serve as early warning controls for avoiding or correcting any future impacts.

20. COMMENT: Section 4 page 64. -- Flatwoods salamander is a federally proposed threatened species.

RESPONSE: The BATES will be revised to evaluate potential project impacts on this species.

21. COMMENT: Section 4 page 77. -- Available data indicate a gradual return to tidal freshwater marsh following Tidegate removal. Analysis of remote sensing information in the DEIS and in earlier reports indicates there has been a significant increase in the amount of tidal freshwater marsh and intermediate marsh since the tide gate was taken out of operation. If properly interpreted, vegetation data from the DEIS corroborates this trend.

The USFWS provided the Savannah District an "Evaluation of the Ecological Study" which included a detailed vegetation data analysis and supports the hypothesis that freshwater marsh is recovering.

RESPONSE: Please see Attachment A, Response to the Evaluation of the Ecological Report.

22. COMMENT: Section 5 page 14. -- The wave model did not indicate significant erosion impacts. However, tidal currents may be more important in controlling beach erosion. Extending the entrance channel 25,000 feet may cause significant changes in coastal circulation patterns and tidal currents. This source of potential impact was evidently not investigated.

RESPONSE: The effect of the channel deepening on the local currents was addressed in Section 5.8. The WQMAP hydrodynamic model showed that the channel deepening would not increase currents in the Savannah River or the areas adjacent to the river mouth. Hence, the deepening should not increase current induced coastal erosion in the areas adjacent to the river mouth (i.e., the north end of Tybee Island). The channel extension lies beyond the hydrodynamic model grid boundaries. However, since the extension is greater than 43,000 feet from the Savannah River jetties and more than 34,000 feet from the Tybee Island shoreline, the channel extension would not induce changes in the currents near the shoreline. Therefore, the channel extension would not impact current induced beach erosion.

23. COMMENT: Section 5 page 16. -- The DEIS does not include modeling runs evaluating impacts of Middle River closure. The DEIS cannot be considered complete without this important information. Closure of Middle River is a major modification of the lower Savannah River. Modeling results are needed in the document to evaluate the positive and negative impacts of this alternative.

RESPONSE: The EIS will be revised to include additional modeling results which present the predicted salinity changes for the Middle River closure avoidance feature under various flow conditions. The result of the Middle River closure modeling indicates that salinity impacts would be avoided in the Middle and Back Rivers with some increase of salinity levels in the Front River. The EIS will be revised to include additional studies which will address the concerns noted and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

24. COMMENT: Section 5 pages 17-25. -- The model grid in Figure 4-1 indicates the model does not cover the entire marsh surface. The "land" boundary condition, therefore, seems somewhat arbitrary and may not permit assessment of affects across the marsh. Cells along the primary feeder creeks off the Front River, Middle River, and Back River, are discussed. However, movement of water through the marsh and its sediments, which would probably have the effects of longest duration on the marsh salinity levels and subsequently vegetation communities there, is not discussed. More documentation is needed to demonstrate that model predictions are really representative of the marsh system, not just the main channels and rivers.

RESPONSE: The model grid does evaluate the individual marsh areas by defining an acreage of coverage associated with each feeder creek. Observation of the system during the field measurements identified that the primary mechanism for the filling and draining of the marshes is through the feeder creeks. The definition of the marshes which includes the coverage area allows the marshes to be filled and drained separately from the main feeder channels and the marshes do show a temporal response to the salinity filling and draining i.e. some level of lag. For this reason it is felt that the model accurately represents the inundation time in the marsh areas. Measurements made of the waters which fill and drain the marshes shows that these water closely mirror the main channel high tide salinities. To transpose the surface water salinities to the interstitial salinities the assumption made in the 1990 report entitled "Development and Application of a habitat Succession Model for the Wetland Complex of the Savannah National Wildlife Refuge" was used. The report states "High salinities may be associated with elevation due to the correlation of river salinity with stage. Water reaches the marsh surface at high tide, stays on the surface of the marsh and infiltrates the sediment and peat, mixing with the stored water. The salinity of the sediment is thus a cumulative average of marsh surface water salinity". Our assumptions follow this.

25. COMMENT: Section 5 page 29. -- The document indicates the 90 percentile post project dissolved oxygen for about four river miles (RM 16.6-20.5) will be less than three (2.2-2.9) parts per million. The document should present minimum predicted dissolved oxygen levels at all river stations. The document should assess the impacts of low DO on the aquatic community because projected DO levels exceed lethal limits for some fish species.

RESPONSE: The DO within the system is highly dynamic and short duration events occur with very low dissolved oxygen levels. Given the short duration of these events along with the dynamic nature of the system it was felt that a statistical presentation of the percentiles was a better representation of the true impacts to the system. The 90th percentile was chosen as representing the extreme critical condition, i.e. 90 percent of the time the DO is above this level. In the CED phase additional DO model simulations will be made. The results of these simulations will be presented in the Tier II EIS. For this work additional, more critical, percentiles, say 95th etc could be presented. It is felt that absolute minimums may not be a good representation of the true impacts, an appropriately high percentile is a better value to present.

26. COMMENT: Section 5 page 33. -- The primary spawning grounds no longer include, "RM 21 and above in the Back River." These areas are the traditional / historical spawning areas, but no longer host a significant amount of spawning activity. The citation for the statement concerning "young-of-the-year" is incorrect. It should be attributed to Wallin et al. 1995.

RESPONSE: Concur. Presently the most productive spawning grounds are found in the Front River, RM 24.4 and greater. Section 5.5.1.3.1.4 discusses the effects on this area as a result the deepening project. The citation for young of the year has been corrected in the DEIS text.

27. COMMENT: Development time of eggs has been estimated at 44 hrs. in the prevailing water temperatures of the Savannah River. This was mentioned in Section 4 and probably should be mentioned here as well (in addition to or instead of the stated 36-40 hrs).

RESPONSE: Concur. The Bayless study (1972) was not mentioned in this section because of more current data on egg development time. The Bayless (1972) egg development time of 44 hours will be added to this section for completeness. Setzler's more recent study,1980, puts forward a development time of 36 to 40 hours, depending on water temperature. This egg development time has been adopted for the purposes of the DEIS.

28. COMMENT: The statement, "No eggs in the early stages of development were collected at sites where salinity exceeded 1.0 ppt." is misleading. There is no definition of, "early stage of development," and the cited report describes capture of eggs in areas of salinity exceeding 1.0 ppt. The vast majority of eggs have been caught in areas where salinity was <1.0. Samples were always taken on the ebb tide, so salinities were approaching dally minimums at each station, which may bias this assessment. Eggs probably do occur at higher salinities. However, their occurrence does not invalidate ATM's choice of critical condition for spawning (1.0 ppt). We suggest that 9 ppt also be examined, as this level has been accepted as the critical limit for survival and development.

RESPONSE: The statement "No..eggs in the early stages of development were collected at sites where salinity exceeded 1.0 ppt" is from the study conducted by Wallin and Van Den Avyle (September 1995, page 9). Description of (5 stage) egg development from Bayless (1972) may be found in Van Den Avyle (et al. 1990). Model runs will be used for egg transport studies in the next phase of the study. A salinity of 9 ppt (Winger and Lasier, 1994) is used by the DEIS, section 4.8.1.3, as the critical limit to egg survival and development.

Egg transport studies will be in the next phase of the DEIS.

29. COMMENT: Section 5 page 36. -- Maximum salinities are mentioned briefly in these sections. This variable is of great value and should have been presented more completely and thoroughly. Brief exposures to high salinity may have detrimental effects on egg and larval survival, thus making the maximum salinity in any portion of river an important variable. The discussion of Front River, RM 21.7, does not agree with the table on page 5-35. The 1 ppt condition is met between 60-70% of the time, not 40%, and the 1 ppt condition at RM 20.5 is met 40-50% of the time, not 20% as is stated.

RESPONSE: Maximum salinities are not used in the DEIS because a statistical representation was determined to better represent effects on biological organisms. Modeling report has examined these issues in Sections 4.1 page 4-1.

The Front River discussion has been corrected.

30. COMMENT: Section 5 page 38. -- The document states that the 1 ppt condition is exceeded at RM 24.4. Although this may be true, and might preclude spawning at this location, this station has been highly productive for egg capture. This means that spawning is occurring upriver of this station, and likely is not affected by salinity changes at that station. The greatest concern should not be the preclusion of spawning because of slightly higher salinity, but the fate of the eggs that are spawned. By increasing salinity at sites further downriver, rearing habitat is pushed farther upriver and probably reduced overall. The concern seems to be with preserving spawning habitat, which is admittedly a primary objective; however, increased egg production is meaningless if the eggs and larvae do not have a place to hatch and grow.

RESPONSE: Concur. Egg transport studies, using additional model runs, will be discussed in the next phase of the DEIS.

31. COMMENT: Section 5 page 39. -- Whether Table 5-5 represents surface or bottom salinities is unclear. If the table represents bottom salinity, then changes in the Front River (RM 21.7 and 20.5) are on the order of 2-3 ppt in the 90th percentile. This is a significant change. Are these predictions for a well-mixed tide (i.e., the spring tide), when bottom conditions may be representative of conditions throughout the water column, or do they represent the stratified condition (i.e., the neap tide), when bottom conditions will be much saltier than conditions elsewhere in the water column? A presentation of surface conditions and bottom conditions would be appropriate.

RESPONSE: The projected salinities are for the bottom in Table 5-5, and the changes along the reach RM 20.5 and RM 21.7 are on the order of 2-3 ppt. These changes reflect the 90 percentile of all salinities at the bottom over a 30 day period. This period goes through two series of spring-neap cycles which are typically 14 days in duration. The table will be modified to state that these are bottom salinities. Bottom values are used as they represent the worst case conditions for salinity change and therefore the worst case for species impact.

32. COMMENT: Section 5 page 40. -- The change in the Front River 90th percentile is described as an increase of 0.2 ppt. This is incorrect. The tables indicate a change of 0.4 ppt.

RESPONSE: Corrected.

33. COMMENT: Section 5 page 41. -- The statement, "The DO will be equal to or greater than the acceptable criterion 85 percent of the time as compared to 70 percent of the time in the existing condition" is wrong. Comparison of Tables 5-4 and 4-6 indicate no change in the 5.0 mg/l level of DO at this station. The critical dissolved oxygen condition is predicted to occur 70% of the time, same as the existing condition. The second statement about RM 14.5 also appears to be incorrect. None of the numbers in this statement correspond to the data presented in Table 4-6.

RESPONSE: Corrected.

34. COMMENT: Section 5 page 42. -- Striped bass egg transport to areas of high salinity would be affected by the project. The document falls to present data on the movement of the lethal/toxic salinity level. Tracking of the 9.0 ppt halocline would be appropriate and necessary to demonstrate the reduction in available habitat for hatching and rearing. The current problem of transport to toxic areas may be exacerbated by this project and thus needs to be investigated more thoroughly.

RESPONSE: In order to evaluate concerns of egg transport into toxic salinities, egg transport studies will be undertaken in the next phase of the DEIS.

35. COMMENT: Section 5 page 54. -- The assumption is made that compensatory wetlands will be constructed in Steamboat River in conjunction with Middle River closure. We believe that Middle River closure may cause adverse impacts in the Savannah River system. It is premature to propose construction of wetlands at this site. An alternate site needs to be identified.

RESPONSE: The EIS will be revised to include additional modeling results which present the predicted salinity changes for the Middle River closure avoidance feature under various flow conditions. The result of the Middle River closure modeling indicates that salinity impacts would be avoided in the Middle and Back Rivers with some increase of salinity levels in the Front River. The EIS will be revised to include additional studies which will address the concerns noted and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

36. COMMENT: Section 5 pages 54-57. -- Because one of the DEIS's conclusions was that no change has occurred in the marsh since Tidegate removal, the impact of salinity increase was not considered significant. Available vegetative data indicate a gradual return to tidal freshwater marsh following Tidegate removal. Analysis of the remote sensing information in the DEIS and in earlier reports indicates a significant increase in the amount of tidal freshwater marsh and intermediate marsh since the Tidegate was taken out of operation. The USFWS provided the Savannah District an "Evaluation of the Ecological Study" which included a detailed vegetation data analysis and supports the hypothesis that freshwater marsh is recovering. Although the species in this marsh demonstrate plasticity in their distributions to a range of salinities, a shift to a slightly more saline environment could cause shifts in the species distributions, dominance, and population densities, and a northward migration of the brackish-intermediate marsh and displacement or elimination of the freshwater marsh that has recovered since the Tidegate was taken out of operation.

RESPONSE: Please see Attachment A, Response to the Evaluation of the Ecological Report.

37. COMMENT: Section 5 page 63. -- The DEIS states in part, "Stream bank and ship-wake generated erosion is an ongoing problem on the channelward side of monument property. The property's shoreline is located well outside the existing channel side slope. Since no bend wideners are proposed in this area, the proposed deepening project will have no effect upon this resource." FOPU lands are identified in the EIS as being adjacent to Stations (-2+OOOB to +8+000).

RESPONSE: There will be no requirement as a part of the deepening project to add riprap at FOPU.

38. COMMENT: Impacts of the 12 proposed bend-wideners were described in the DEIS on pages 66 to 69 of Section 5. However, we were unable to find a figure that illustrated the extent and location of these features in relation to their surroundings. One widener is described as being located between Stations 12+000 and 9+000. Since the area adjacent to FOPU was identified as being between -2+OOOB and 8+000, it would appear this development would be immediately up stream of the monument. If this is the case, potential impacts to the channelward side of FOPU need to be addressed.

RESPONSE: The Engineering Appendix, Figures 1-33, show the locations of the 12 proposed bend-wideners.

39. COMMENT: Figure 4-7. -- Some of the columns in this table appear to be misplaced or the data appears to be incorrect. The table, as presented, shows a positive deepening impact to DO.

RESPONSE: The data within these columns are not misplaced. There are areas where the pre- versus post-project dissolved oxygen does show improvement. This is due to the alteration of the system transport and the potential for transport of oxygen demanding material from one reach to another. If the project impacts cause material to remain in one reach for a longer period of time, the material may not reach other areas that were reached in the pre-project condition.

Specific Draft Feasibility Report Comments

40. COMMENT: Section 1 page 10. -- The economic analysis completed in February 1998 indicated that the 46 foot depth was the NED plan while the Draft Feasibility report indicates the 47 foot depth is the NED plan. The reason for this change should be explained.

RESPONSE: The Economic Appendix has been revised to support a NED and Recommended plan selection of a -48 foot project depth. GPA concurs with this selection and has selected the -48 foot project depth as the Locally Preferred Plan.

41. COMMENT: Section 1 page 13. -- The Natural Resources Mitigation plan is seriously flawed. Purchase of wetlands, without restoration or management improvement will have little value for mitigation. In addition, little tidal freshwater marsh remains in the Savannah River system outside the Savannah NWR. The feasibility of closing off Middle River has not been established. While this action would reduce salinity intrusion in Middle River, it would also increase salinity intrusion in Front River. Impacts to tidal freshwater marsh would simply be shifted from Middle River to Front River. Much of the remaining striped bass reproduction occurs in the Front River. How much reproduction will recover in the Back River is unclear. Because this proposal would increase salinity in Front River it could exacerbate impacts to striped bass habitat under current conditions. This action could also cause adverse changes in water level, sedimentation rate, current velocity and fish and wildlife movement in Back River and Middle River.

RESPONSE: The EIS will be revised to include additional modeling results which present the predicted salinity changes for the Middle River closure avoidance feature under various flow conditions. The result of the Middle River closure modeling indicates that salinity impacts would be avoided in the Middle and Back Rivers with some increase of salinity levels in the Front River. The EIS will be revised to include additional studies which will address the concerns noted and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

42. COMMENT: Section 5 page 4. -- The document states that the inner harbor is not adequate for existing and projected larger vessels. However page 5-2 of the Economics appendix states that the existing Port of Savannah is relatively comparable or advantaged to other ports in the south Atlantic. The latter statement either indicates that Savannah is adequate at least for existing larger vessels or all south Atlantic ports are inadequate for existing larger vessels.

RESPONSE: The multiport analysis identified the Port of Savannah to be generally comparable in its offering of overall infrastructure to other major ports in the South Atlantic. However, distinct differences can be identified when focusing each individual infrastructure component. However, no port within the South Atlantic was identified which will not require some degree or type of deepening project over the study period to support the world and South Atlantic containership fleet of the future.

43. COMMENT: Section 5 page 13 and Draft Economics Appendix Page 3-6. -- The document indicates a projected year 50 throughput for Savannah of over six million TEUs, which is more than the existing Port of Long Beach. Is this assumption valid given the respective size of the hinterland served and the potential to provide the necessary land side facilities? This is also about 10 times the existing throughput at Savannah. The report should provide information on how much throughput existing container cranes and berths could accommodate. The report should also determine how many additional berths and cranes would be needed and their locations.

RESPONSE: The trade forecast is consistent with prior Corps studies and forecasts by leading economic consultants. GPA is committed to port modernization to provide the necessary infrastructure to handle future cargo. The economic analysis was completed in accordance with federal guidelines for deep draft navigation studies. The trade forecast model used in the analysis projects trade through a system of global commodity models, capturing individual country demands for imports, linked to economic growth and domestic production, by industry and country. Given the current and forecast world economic indicators, it is reasonable to expect the Port of Savannah to handle 6 million TEUs per year in 2050. Similar or higher growth is expected at most major U.S. ports over the study period.

An evaluation of the theoretical capacity of the Port of Savannah and several other ports in the U.S. was completed. Results of this analysis show that most ports have sufficient capacity to handle current and near term growth in cargo volumes. In the case of Savannah, the analysis identified that the Port's current annual capacity exceeded 1.0 million TEUs with only minor changes in infrastructure or operational practices. In accordance with federal guidelines, documentation has been provided describing plans by the Port of Savannah to improve the throughput capacity when necessary. Support of long term growth in cargo volumes beyond current capacity will be supported by additional port investment in infrastructure and new technologies to increase capacity and productivity.

44. COMMENT: Section 5 page 42. -- Available vegetative data indicate a gradual return to tidal freshwater marsh following Tidegate removal. Analysis of the remote sensing information in the DEIS and in earlier reports indicates a significant increase in the amount of tidal freshwater marsh and intermediate marsh since the Tidegate was taken out of operation. This indicates a significant recovery of tidal freshwater marsh since removal of the Tidegate. The USFWS provided the Savannah District an "Evaluation of the Ecological Study" which included a detailed vegetation data analysis and supports the hypothesis that freshwater marsh is recovering.

RESPONSE: Please see Attachment A, Response to the Evaluation of the Ecological Report.

45. COMMENT: Shortnose sturgeon habitat would also be adversely affected by the project. In the past, shortnose sturgeon, which is an endangered species under jurisdiction of the NMFS, have used the KITB as nursery and foraging habitat. DO levels in this area under current conditions are frequently marginal to support this species. The predicted decrease in DO will result in degradation of the available habitat and possibly loss of this habitat. In addition, Savannah Harbor DO is frequently lower than the level needed to support a healthy aquatic community. The proposed project will further depress the existing low DO level.

RESPONSE: The proposed project will take steps to avoid, through mitigation, DO decreases that would cause adverse impacts to the SNS. In addition the project will fund long-term studies to ascertain any potential adverse impacts to SNS and these studies will serve as early warning controls for avoiding or correcting any future impacts.

46. COMMENT: Section 5 page 42 Section 7 page 27 and Section 9 page 4. -- The Natural Resources Mitigation plan is seriously flawed and the USFWS does not support the proposed plan. The USFWS has not agreed that details of the mitigation plan can be refined in the engineering and design phase. The USFWS believes a mitigation plan must be completed prior to completion of the final feasibility report and Congressional authorization.

RESPONSE: The EIS will be revised to include additional modeling results which present the predicted salinity changes for the Middle River closure avoidance feature under various flow conditions. The result of the Middle River closure modeling indicates that salinity impacts would be avoided in the Middle and Back Rivers with some increase of salinity levels in the Front River. The EIS will be revised to include additional studies which will address the concerns noted and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

Summary Comments

47. COMMENT: The predicted increase in salinity and decrease in DO would cause unacceptable impacts to nationally important fish and wildlife resources. Because of the scarcity and high value of the freshwater habitat and past cumulative impacts, any salinity increases in Savannah NWR need to be avoided. The project would eliminate 42 percent (1170 acres) of remaining tidal freshwater marsh in Savannah NWR and only 27 percent of the original refuge tidal freshwater marsh would remain. It is also likely that restoration of the naturally reproducing population of striped bass in the lower Savannah River would be precluded. To date, no effective mitigation measures for salinity and DO impacts have been identified. The proposed closure of Middle River is a high-risk alternative which may cause more harm than good. The USFWS believes a mitigation plan must be completed prior to completion of the final feasibility report and congressional authorization. If deep water port development is pursued in Savannah low risk mitigation alternatives, such as release of flows from upstream Corps reservoirs, that would restore freshwater habitat and avoid any further salinity increases in Savannah NWR should be considered.

RESPONSE: The EIS will be revised to include additional modeling results which present the predicted salinity changes for the Middle River closure avoidance feature under various flow conditions. The result of the Middle River closure modeling indicates that salinity impacts would be avoided in the Middle and Back Rivers with some increase of salinity levels in the Front River. The EIS will be revised to include additional studies which will address the concerns noted and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

48. COMMENT: We will continue to work toward an acceptable resolution of these unresolved issues. However, because of these serious impacts and deficiencies, we may refer this project to the CEQ under NEPA regulations.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
P.O. Box 12559
217 Fort Johnson Road
Charleston, South Carolina 29422-2559

June 16, 1998

Mr. M. J. Yuschishin
Chief, Planning Division
Savannah District, Corps of Engineers
P.O. Box 889
Savannah, Georgia 31402-0889

Dear Mr. Yuschishin:

The Fish and Wildlife Service has reviewed the Biological Assessment (BA) provided with your letter of May 6, 1998 and has the following recommendations. Comments on the Draft Environmental Impact Statement and Draft Feasibility Report are being provided under separate cover.

The Service recommends that the manatee precautions be placed in the project description section thereby making them a legal and binding part of the project. The Corps should add the following precautions (in addition to those in the BA):

1. All construction personnel are responsible for observing water-related activities for the presence of manatees.

2. All construction personnel will be advised that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973, as amended. The permittee and/or contractor may be held responsible for any manatee harmed, harassed, or killed as a result of construction activities.

3. Siltation barriers will be used in a manner and made of material in which manatees cannot become entangled, and be properly secured, and regularly monitored to avoid manatee entrapment. Barriers must not block manatee entry to or exit from essential habitat.

4. If manatees are seen within 100 yards of the active daily construction / dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure protection of the manatees. These precautions shall include operating all equipment in such a manner that moving equipment does not come any closer than 50 feet of any manatee. Operation of any equipment closer than 50 feet to a manatee shall necessitate immediate shutdown of that equipment. Activities will not resume until the manatee(s) has departed the project of its own volition.

5. Any collision with, any / or injury to a manatee will be reported immediately to the South Carolina Department of Natural Resources, the Georgia Department of Natural Resources, and the Service.

6. Temporary signs concerning manatees shall be posted prior to and during all construction / dredging activities. All signs are to be removed by the Corps / permittee upon completion of the project. A sign measuring at least 3 ft. by 4 ft., which reads Caution.-- Manatee Area will be posted in a location prominently visible to water related construction crews. A second sign should be posted if vessels are associated with the construction, and should be placed visible to the vessel operator. The second sign should be at least 8 1 / 2" by 11" which reads Caution: Manatee Habitat. Idle speed is required of operating a vessel in the construction area. All equipment must be shutdown if a manatee comes within 50ft. of operation. Any collision with and / or injury to a manatee shall be reported immediately to the Georgia Department of Natural Resources (912264-7218), the South Carolina Department of Natural Resources (843-844-24 73), and the US. Fish and Wildlife Service (803-765-5626 or 912-652-4036). (See attachments for examples of signs).

We also recommend that the project avoid construction during the manatee breeding season (May-September).

The BA draws a conclusion that if the manatee precautions are implemented, the proposed plan would not jeopardize the continued existence of this species. The Service believes a more accurate determination for the Corps to make is either the project (1) is not likely to adversely affect the manatee, or (2) may adversely affect the manatee.

There is not a determination of effect in the BA for the wood stork, bald eagle, peregrine falcon, piping plover, red-cockaded woodpecker, Bachman's warbler, Kirtland's warbler, Eastern indigo snake, flatwoods salamander, or any of the plant species.

For all of the species under the Service's jurisdiction, the Corps must make one of the following determinations: (1) no effect; (2) is not likely to adversely affect, or (3) is likely to adversely affect. "No effect" is the appropriate conclusion if the proposed action will not affect listed species. "Is not likely to adversely affect" is the appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. "Is likely to adversely affect" is the appropriate conclusion if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions. (50 CFR 402). If the Corps makes a determination of "not likely to adversely affect," the Service will respond in writing with

a concurrence or non-concurrence letter. If a determination of "likely to adversely affect" for a species is made, the Corps must initiate formal consultation with this office. For the flatwoods salamander, a species proposed for listing as threatened, a determination of not likely to or likely to jeopardize the continued existence of the species is necessary.

We appreciate the opportunity to provide these recommendations pursuant to the Endangered Species Act. Comments and recommendations on the Draft Environmental Impact Statement and Draft Feasibility Report are being provided under separate cover.

Sincerely yours,

Roger L. Banks
Field Supervisor

RLB/EE/km

Attachment

TEMPORARY MANATEE SIGNS
for standard manatee construction conditions

The Caution: Manatee Area signs are available through the companies listed below and may also be available from other local suppliers throughout the state. Permit/lease holders, should contact sign companies directly to arrange for shipping and billing.

Cape Coral Signs & Designs Inc.
1311 Del Prado Boulevard
Cape Coral, Florida 33990
1-800-813-9992
813-772-9992
FAX 813-772-9992

Municipal Supply and Sign Company
Post Office Box 17
Naples, Florida 33939-176S
1-800-329-5366
813-262-4639
FAX 813-262-4645

JADCO Signing Inc.
708 Commerce Way
Post Office Box 911
Jupiter, Florida 33458
1-800-432-3404
407-747-1065
FAX 407-744-2985

The second sign should be at least 8 1/2 inches by 11 inches, and should read:

Caution: Manatee Habitat. Idle speed is required if operating a vessel in the construction area. All equipment must be shutdown if a manatee comes within 50 feet of operation. An collision with and/or injury to a manatee shaft be reported immediately to the Florida Marine Patrol at 1-800-DIAL FMP (I-8OO-342-5367). The U.S. Fish and Wildlife Service should also be contacted in Jacksonville (1-904-232-2580) for north Florida or in Vero Beach (1-407-562-3909) for south Florida.

An example is enclosed, and this example can be copied and used during construction activities.

EDITOR'S NOTE: The second page of the attachment contained an example sign. That page could not be reproduced well in an electronic form.

Letter response

United States Department of the Interior

FISH AND WILDLIFE SERVICE
P.O. Box 12559
217 Fort Johnson Road
Charleston, South Carolina 29422-2559

June 16, 1998

1. COMMENT: The Service recommends that the manatee precautions be placed in the project description section thereby making them a legal and binding part of the project. The Corps should add six precautions – as listed in the letter -- in addition to those in the BA.

RESPONSE: Concur. The precautions described in Section 9.0 of the BATES titled DETERMINATION are considered to be legally binding on the project. The project description section will be revised to reference the conditions included in this USFWS letter and the BATES.

2. COMMENT: We recommend that the project avoid construction during the manatee breeding season (May-September).

RESPONSE: Avoiding construction during those months would effectively double the duration of construction period in the inner harbor. Segmenting the project in that manner would increase the time period over which all other aquatic life would be subjected to the additional stresses resulting from the construction activities. Since the precautions deemed appropriate by the USFWS to protect manatee will be included in the project, we do not believe that the additional duration of impacts to all other aquatic life resulting from an extended construction period warrant the minor additional protection to manatee during those months.

3. COMMENT: The BA draws a conclusion that if the manatee precautions are implemented, the proposed plan would not jeopardize the continued existence of this species. The Service believes a more accurate determination for the Corps to make is either the project (1) is not likely to adversely affect the manatee, or (2) may adversely affect the manatee.

RESPONSE: The conclusions of the BATES will be revised to state that with implementation of the manatee precautions, the proposed project is not likely to adversely affect the manatee.

4. COMMENT: There is not a determination of effect in the BA for the wood stork, bald eagle, peregrine falcon, piping plover, red-cockaded woodpecker, Bachman's warbler, Kirtland's warbler, Eastern indigo snake, flatwoods salamander, or any of the plant species.

RESPONSE: Concur. Section 6 of the BATES discusses the potential project impact on the habitat of many of these species. Section 9 of the BATES will be revised to specifically make a determination on those species.

5. COMMENT: For all of the species under the Service's jurisdiction, the Corps must make one of the following determinations: (1) no effect; (2) is not likely to adversely affect, or (3) is likely to adversely affect.

RESPONSE: Concur. The BATES will be revised to use one of the determinations described in the USFWS letter.

United States Department of the Interior
FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345

June 22, 1998

Colonel Grant M. Smith
District Engineer, Savannah District
Department of the Army, Corps of Engineers
P.O. Box 889
Savannah, Georgia 31402-0889

Dear Colonel Smith:

The Fish and Wildlife Service has reviewed the Draft Environmental Impact Statement and Draft Feasibility Report for the Savannah Harbor Expansion Project. The DEIS was provided to us by letter dated May 6, 1998, from Mr. M.J. Yuschishin of your planning division, and was advertised by a public notice dated May 8.

The proposed harbor expansion project is being pursued under expedited procedures contained in Section 203 of the Water Resources Development Act of 1986 (WRDA 86). This provision allows a non-Federal entity to perform project feasibility studies, including appropriate coordination and environmental studies, under legal mandates of the Corps of Engineers' civil works program. Upon completion of required studies, coordination, and review of the feasibility report the Assistant Secretary of the Army may transmit the report with recommendations, to Congress. Congressionally authorized projects may then be eligible for Federal cost sharing.

These comments are submitted as a planning aid letter in partial fulfillment of the statutory requirements under the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661-667d). These comments do not constitute the final report of the Secretary of the Interior as required by Section 2(b) of the FWCA. Previous comments pursuant to Section 7 of the Endangered Species Act were provided by our Charleston Field Office in a letter dated June 16, 1998. A planning aid letter pursuant to the Fish and Wildlife Coordination Act was provided by that same office on March 26. Because of a lack of modeling data needed for impact analysis, the lack of an acceptable mitigation plan, and serious fish and wildlife resource concerns discussed below, we cannot provide a completed report pursuant to the Fish and Wildlife Coordination Act at this time. Further comments pursuant to Section 102 of the National Environmental Policy Act will be issued from the Department of Interior's Regional Environmental Officer in mid July.

General DEIS Comments

We believe the draft statement omits significant information needed to fully evaluate environmental impacts of the proposed project. In November of 1997, the Service recommended that the hydrodynamic (salinity) model be run at the two, four, six, and eight foot alternatives so environmental impacts of each alternative could be properly evaluated. Georgia Ports Authority (GPA) decided to run the model at only the eight foot alternative even though engineering and economic analyses were performed at two foot intervals. We believe the lack of model results on salinity and dissolved oxygen impacts for the two, four, and six foot alternatives make it impossible to conduct an informed alternatives analysis. Georgia Ports Authority believes water quality impacts of deepening are linear but no data supports that assumption.

In February 1998, the Service recommended that additional model runs targeted toward mitigation evaluation be completed prior to determining the selected alternative. Subsequently, specific recommendations on model runs needed for analysis of mitigation alternatives were provided to GPA. To date, recommended model runs have not been completed. The resulting lack of information makes correct formulation and evaluation of mitigation alternatives impossible. Specifically, we are concerned that predicted salinity increases may preclude restoration of the lower Savannah River striped bass population by decreasing the small amount of remaining suitable habitat. Mitigation model runs for Back River restoration need to be performed prior to determination of the selected alternative. With this data, the Service could estimate the impacts of harbor deepening in conjunction with restoration/mitigation efforts. By doing so, we could assess overall impacts to striped bass habitat.

Based on model data provided in the preliminary DEIS, we believe projected salinity increases in the lower Savannah River system will adversely impact fish and wildlife resources. Moderate incremental increases in the salinity level have become cumulatively significant as depth of the harbor has been repetitively -increased over time. Potential impacts of the proposed deepening project must be considered in the context of these cumulative salinity impacts. Model results and analysis of existing data indicate harbor deepening would cause significant salinity incursion upstream in the Front River and Middle River, further adversely impacting Savannah National Wildlife Refuge. An increased salinity level would adversely impact freshwater wetlands and striped bass habitat on and near Savannah National Wildlife Refuge.

Tidal fresh marsh on Savannah NWR supports an extremely diverse plant community providing food, cover and nesting habitat for a wide variety of wildlife species. Tidal freshwater marsh is relatively scarce in comparison to coastal brackish and salt marshes. Because of this scarcity and its high fish and wildlife value, a primary Service goal is to restore and maintain tidal freshwater marsh in the lower Savannah River. Past harbor modifications, including deepening, have greatly increased salinity levels throughout much of Savannah NWR and reduced the quantity of tidal freshwater marsh.

Savannah NWR contained about 6,000 acres of tidal freshwater marsh when established in 1927. By 1997, due to the cumulative impacts of harbor deepening, tidal freshwater marsh had declined to 2,800 acres, a reduction of 53 percent. Based on the location of the 0.5 ppt salinity contour at a flow of 8,200 cfs as provided for in the DEIS, the refuge would support about 1,630 acres of tidal freshwater marsh. Therefore after the proposed project, only a remnant (27 percent) of the original tidal freshwater marsh would remain

Restoration of striped bass spawning and nursery habitat to support a self-sustaining Savannah River striped bass population is another primary Service goal. Prior to 1977, the Savannah River supported the most important striped bass population in the State of Georgia. Production of striped bass eggs in the Savannah River estuary has declined by about 95 percent since that time. Tide gate operation, in conjunction with the cumulative impacts of harbor deepening, caused a number of impacts, including increased salinity and loss of suitable spawning habitat throughout most of Little Back River and the lower Savannah River. Striped bass eggs and larvae were also transported through New Cut and then rapidly downstream to areas with toxic salinity levels. It was hoped the tide gate restoration project would improve conditions. Unfortunately, in spite of supplemental stocking and an increase in adult numbers, the striped bass population has not recovered as anticipated. The failure of recovery may be due, in part, to the cumulative impacts of harbor deepening. We believe that the salinity increases predicted by the model would preclude restoration of the lower Savannah River striped bass population.

Based on existing data and model predictions, low flow (less than 6,000 cfs) salinity would be eight to nine ppt in the Front River between river miles 21.5 and 24 and would be between five and eight ppt in the Middle River between river miles 22 and 24. We expect these predicted levels to be higher when the model is properly calibrated. This salinity level would be high enough to kill cypress and hardwood tree species common in the tidal forested wetlands, especially when the influence of storm surges is considered. Studies in Wilmington, North Carolina have documented the degradation of tidal forested wetlands due to salinity increases and water level changes associated with navigation channel deepening. In Wilmington, much of the forested wetland was converted to brackish marsh.

Shortnose sturgeon habitat would also be adversely affected by the project. In the past, shortnose sturgeon, which is an endangered species under jurisdiction of the National Marine Fisheries Service, have used the Kings Island Turning Basin as nursery and foraging habitat. Currently, dissolved oxygen levels in this area are frequently marginal to support this species. The predicted decrease in dissolved oxygen will result in degradation and possibly loss of this habitat. In addition, Savannah Harbor dissolved oxygen levels are frequently lower than the level needed to support a healthy aquatic community. The proposed project will further depress the existing low dissolved oxygen level.

The DEIS does not adequately characterize the potential risk of contaminants in the dredged material to fish and wildlife during dredging activities or after placement of the material in a designated disposal area. Data from many of the analyses proposed in the Sampling and Analysis Plan (SAP) were not conducted or presented in the DEIS. Also, the inappropriate use of ecological risk assessment tools throughout the document makes the interpretations of the data presented in the DF-IS inaccurate and misleading. The sediment and elutriate analyses presented show the presence of certain contaminants at levels associated with deleterious ecological impacts in all reaches proposed for dredging. Disturbance of sediments during dredging activities may liberate sediment-bound contaminants into the water column where they would be more biologically available to aquatic species. In addition, the presence of elevated contaminant concentrations in elutriate samples suggest that drainage from disposal areas may impact habitat quality in the receiving wetlands. Fish and wildlife utilization of the proposed upland disposal areas was underestimated resulting in an inaccurate assessment of potential wildlife exposure and risk due to the contaminants present in the dredged material. Alternatively, placement of certain material in the ocean dredged material disposal site may lead to further water quality impacts that may be detrimental to aquatic organisms. These concerns should be addressed before the plan is finalized and sent to Congress for approval. The Charleston Office will provide a more detailed planning aid letter regarding potential contaminant impacts within the week.

The primary recommended mitigation measure, closure of Middle River, is a major modification of the lower Savannah River. No model results are provided to evaluate the hydrodynamic impacts of the proposed closure. We believe Middle River closure is a high risk mitigation measure that could cause significant adverse impact. We are concerned the plan would simply shift the salinity problem further up Front River, perhaps as far as McCoys Cut, and into Back River and Middle River. This action could also cause adverse changes in water level, sedimentation rate, current velocity and fish and wildlife movement in Back River and Middle River.

Specific DEIS Comments

Section I page 6. Contrary to data presented in the last paragraph, studies are available that indicate a gradual return to tidal freshwater marsh following tide gate removal (Latham and Kitchens 1996). If properly interpreted, vegetation data from the DEIS corroborates this trend. The attached "Evaluation of the Ecological Study" provides a detailed analysis of the vegetation data.

Section 3 page 1. The feasibility of closing off Middle River has not been established. While this action would reduce salinity intrusion in Middle River, it would also increase salinity intrusion in Front River. Impacts to tidal freshwater marsh would simply be shifted from Middle River to Front River. Much of the striped bass reproduction that remains occurs in Front River. How much reproduction will recover in Back River is unclear. Because this proposal would increase salinity in Front River, it could exacerbate impacts to striped bass habitat under current conditions.

This action could also cause adverse changes in water level sedimentation rate, current velocity and fish and wildlife movement in Back River and Middle River and water quality at the City of Savannah water intake.

Section 4 pages 7-28. Differences in interstitial salinities in the marshes vs. water column salinities in the rivers have not been thoroughly discussed. If most of the sampling was done in main channels, how can extensions of baseline conditions be made to inner areas and secondary channels if these areas were not sampled? In the 1986-88 study, the marsh soil salinities reflected average high-tide channel salinities with the tide gate in operation. This was confirmed with concurrent sampling of water column salinities in the channels and interstitial marsh salinities. What kind of baseline project description of salinities can be made if the interstitial salinities were not sampled with channel water column salinities in 1997? Although the salinity model uses high tide condition to represent the marsh flooding period, the temporal extent of the salinity levels is not addressed in their description of current conditions, and the model grid does not extend beyond the main river channels, so predictions of changes to the baseline marsh levels (in sediments, outside of canals) may not be accurate.

In the 1986-88 study, marsh water levels frequently exceeded river levels due to the marsh sediments' capacity to hold water. It was reported that the marsh water levels probably fluctuated less than the river water levels (1ft vs. 7ft in 1986-88), and that the marsh stage was not well-related to the river stage, possibly due to the time required for tidal water to cross the surface (slowed by interference by vegetation, water storage and sediment absorption). Marsh sediments remained saturated even when channel water levels were low. Measurements made in 1997 at Marsh sample 04A demonstrates the site retains saline water on the surface longer than in water measured at the bottom of the USFWS dock (Figure 3-23). The salinity of the sediments would probably be a high average of the marsh surface water that is standing, entering, and leaving- Estimations from the 1986-88 studies predicted that marsh sediments above the Highway 17 bridge required 2 months to reach freshwater salinity levels once the tide gate was taken out of operation due to the long salinity retention properties of the sediments. Temporal and spatial relationships of these salinity levels need to be better defined so a more accurate assessment of potential impact to marsh vegetation can be made.

Section 4 page 43. The statement that, "In the Savannah River and its tributaries, salinities were found to be below the lethal limit threshold for striped bass eggs" is incorrect. Portions of the river are now and have always been above the "lethal limit." The areas referenced are the traditional spawning grounds, which although below lethal levels, received enough salt water input as to become unattractive to spawning adults.

Section 4 page 52. The document should use more current information on manatee numbers in the Savannah River. Georgia DNR and South Carolina DNR have recent additional information. Also contact should be made with the Manatee Coordinator, USFWS, Jacksonville, FL (904) 232-2580.

Section 4 page 62. The statement that the existing navigation project is having no unacceptable impacts on shortnose sturgeon or its habitat is not well supported. There has been only limited research on shortnose sturgeon in the Savannah River. The existing navigation project may be impacting shortnose sturgeon through impacts on dissolved oxygen levels and salinity. The latest surveys show the population is skewed toward older individuals, indicating the shortnose sturgeon population may be impacted by the current project.

Section- 4 page 64. Flatwoods salamander is a federally proposed threatened species.

Section 4 page 77. Available data indicate a gradual return to tidal freshwater marsh following tide gate removal (Latham and Kitchens 1996). Analysis of remote sensing information in the DEIS and in earlier reports (Pearlstine et al 1990) indicates there has been a significant increase in the amount of tidal freshwater marsh and intermediate marsh since the tide gate was taken out of operation. If properly interpreted, vegetation data from the DEIS corroborates this trend. The attached "Evaluation of the Ecological Study" provides a detailed analysis of the vegetation data.

Section 5 page 14. The wave model did not indicate significant erosion impacts. However, tidal currents may be more important in controlling beach erosion- Extending the entrance channel 25,000 feet may cause significant changes in coastal circulation patterns and tidal currents. This source of potential impact was evidently not investigated.

Section 5 page 16. The DEIS does not include modeling runs assuming closure of Middle River. The DEIS cannot be considered complete without this important information. Closure of Middle River is a major modification of the lower Savannah River. Modeling results are needed in the document to evaluate the positive and negative impacts of this alternative.

Section 5 pages 17-25. The model grid in Figure 4-1 indicates the model does not cover the entire marsh surface. The "land" boundary condition, therefore, seems somewhat arbitrary and may not permit assessment of affects across the marsh. Cells along the primary feeder creeks off the Front River, Middle River, and Back River, are discussed. However, movement of water through the marsh and its sediments, which would probably have the effects of longest duration on the marsh salinity levels and subsequently vegetation communities there, is not discussed. More documentation is needed which demonstrates that model predictions are really representative of the marsh system, not just the main channels and rivers.

Section 5 page 29. The document indicates the 90 percentile post project dissolved oxygen for about four river miles (RM 16.6-20.5) will be less than three (2.2-2.9) parts per million. The document should present minimum predicted dissolved oxygen levels at all river stations. The document should assess the impacts of low dissolved oxygen on the aquatic community because projected dissolved oxygen levels exceed lethal limits for some fish species.

Section 5 page 33. The primary spawning grounds no longer include, "RM 21 and above in the Back River." These areas are the traditional historical spawning areas, but no longer host a significant amount of spawning activity. The citation for the statement concerning "young-of-the-year" is incorrect. It should be attributed to Wallin et al. 1995.

Development time of eggs has been estimated at 44 hrs. in the prevailing water temperatures of the Savannah River (Bayless 1972). This was mentioned in Section 4 and probably should be mentioned here as well (in addition to or instead of the stated 36-40 hrs).

The statement, "No eggs in the early stages of development were collected at sites where salinity exceeded 1.0 ppt." is misleading. There is no definition of, "early stage of development," and the cited report (Reinert et al. 1996) describes capture of eggs in areas of salinity exceeding 1.0 ppt. The vast majority of eggs have been caught in areas where salinity was <1.0. Samples were always taken on the ebb tide, so salinities were approaching daily minimums at each station, which may bias this assessment. Eggs probably do occur at higher salinities. However, their occurrence does not invalidate ATM's choice of critical condition for spawning (1.0 ppt). We suggest that 9 ppt also be examined, as this level has been accepted as the critical limit for survival and development (Winger and Lasier 1994).

Section 5 page 36. Maximum salinities are mentioned briefly in these sections. This variable is of great value and should have been presented more completely and thoroughly. Brief exposures to high salinity may have detrimental effects on egg and larval survival, thus making the maximum salinity in any portion of river an important variable.

The discussion of Front River, RM 21.7, does not agree with the table on page 5-35. The 1 ppt condition is met between 60-70% of the time, not 40%, and the 1 ppt condition at RM 20.5 is met 40-50% of the time, not 20% as is stated.

Section 5 page 38. The document states that the 1 ppt condition is exceeded at RM 24.4. Although this may be true, and might preclude spawning at this location, this station has been highly productive for egg capture. This means that spawning is occurring upriver of this action, and likely is not affected by salinity changes at that station. The greatest concern should not be the preclusion of spawning because of slightly higher salinity, but the fate of the eggs that are spawned. By increasing salinity at sites further down river, rearing habitat is pushed farther upriver and probably reduced overall. The concern seems to be with preserving. spawning habitat, which is admittedly a primary objective; however, increased egg production is meaningless if the eggs and larvae do not have a place to hatch and grow.

Section 5 page 39. Whether table 5-5 represents surface or bottom salinities is unclear. If the table represents bottom salinity, then changes in the Front River (RM 21.7 and 20.5) are on the order of 2-3 ppt in the 90th percentile. This is a significant change. Are these predictions for a well-mixed tide (i.e., the spring tide), when bottom conditions may be representative of conditions throughout the water column, or do they represent the stratified condition (i.e., the neap tide), when bottom conditions will be much saltier than conditions elsewhere in the water column? A presentation of surface conditions and bottom conditions would be appropriate.

Section 5 page 40. The change in the Front River 90th percentile is described as an increase of 0.2 ppt. This is incorrect. The tables indicate a change of 0.4 ppt.

Section 5 page 4l - The statement, "The DO will be equal to or greater than the acceptable criterion 85 percent of the time as compared to 70 percent of the time in the existing condition" is wrong. Comparison of Tables 5-4 (p.38) and 4-6 (p.41) indicate no change in the 5.0 mg/l level of DO at this station. The critical dissolved oxygen condition is predicted to occur 70% of the time, same as the existing condition. The second statement about RM 14.5 also appears to be incorrect. None of the numbers in this statement correspond to the data presented in Table 4-6.

Section 5 page 42. Striped bass egg transport to areas of high salinity would be affected by the project. The document fails to present data on the movement of the lethal/toxic salinity level (9.0 ppt, Winger and Lasier 1994). Tracking of the 9.0 ppt halocline would be appropriate and necessary to demonstrate the reduction in available habitat for hatching and rearing. The current problem of transport to toxic areas may be exacerbated by this project and thus needs to be investigated more thoroughly.

Section 5 page 54. The assumption is made that compensatory wetlands will be constructed in Steamboat River in conjunction with Middle River closure. We believe that Middle River closure may cause adverse impacts in the Savannah River system. It is premature to propose construction of wetlands at this site. An alternate site needs to be identified,

Section 5 pages 54-57. Because one of the DEIS's conclusions was that no change has occurred in the marsh since tide gate removal, the impact of salinity increase was not considered significant. However, given the discussion in the attached "Evaluation of the Ecological Study", this conclusion is likely flawed, and the probability of loss of marsh undergoing conversion since the gate was taken out of operation is fairly certain. Although the species in this marsh demonstrate plasticity in their distributions to a range of salinities, a shift to a slightly more saline environment could cause shifts in the species distributions, dominance, and population densities, and a northward migration of the brackish-intermediate marsh and displacement or elimination of the freshwater marsh that has recovered since the tide gate was taken out of operation.

Figure 4-7. Some of the columns in this table appear to be misplaced or the data appears to be incorrect. The table, as presented, shows a positive deepening impact to dissolved oxygen.

Specific Draft Feasibility Report Comments

Section 1 page 10. The Draft Economic Analysis completed in February 1998 indicated that the 46 foot depth was the NED plan while the Draft Feasibility report indicates the 47 foot depth is the NED plan. The reason for this change should be explained.

Section 1 page 13. The Natural Resources Mitigation plan is seriously flawed. Purchase of wetlands, without restoration or management improvement will have little value for mitigation In addition, little tidal freshwater marsh remains in the Savannah River system outside the Savannah National Wildlife Refuge. The feasibility of closing off Middle River has not been established. While this action would reduce salinity intrusion in Middle River, it would also increase salinity intrusion in Front River. Impacts to tidal freshwater marsh would simply be shifted from Middle River to Front River. Much of the remaining striped bass reproduction occurs in the Front River- How much reproduction will recover in the Back River is unclear. Because this proposal would increase salinity in Front River it could exacerbate impacts to striped bass habitat under current conditions. This action could also cause adverse changes in water level, sedimentation rate, current velocity and fish and wildlife movement in Back River and Middle River.

Section 5 page 4. The document states that the inner harbor is not adequate for existing and projected larger vessels. However page 5-2 of the Draft Economics appendix states that the existing Port of Savannah is relatively comparable or advantaged to other ports in the south Atlantic. The latter statement either indicates the Port of Savannah is adequate at least for existing larger vessels or all south Atlantic ports are inadequate for existing larger vessels.

Section 5 page 13 and Draft Economics Appendix Page 3-6. The document indicates a projected year 50 throughput for Savannah of over six million TEUs which is more than the existing Port of Long Beach. Is this assumption valid given the respective size of the hinterland served and the potential to provide the necessary land side facilities? This is also about 10 times the existing throughput at Savannah. The report should provide information on how much throughput existing container cranes and berths could accommodate. The report should also determine how many additional berths and cranes would be needed and their locations.

Section 5 page 42. Available vegetative data indicate a gradual return to tidal freshwater marsh following tide gate removal (Latham and Kitchens 1996). Analysis of the remote sensing information in the DEIS and in earlier reports (Pearlstine et al 1990) indicates a significant increase in the amount of tidal freshwater marsh and intermediate marsh since the tide gate was taken out of operation. This indicates a significant recovery of tidal freshwater marsh since removal of the tide gate. The attached "Evaluation of the Ecological Study" provides a detailed analysis of the vegetation data.

Shortnose sturgeon habitat would also be adversely affected by the project. In the past, shortnose sturgeon, which is an endangered species under jurisdiction of the National Marine Fisheries Service, have used the Kings Island Turning Basin as nursery and foraging habitat. Dissolved oxygen levels in this area under current conditions are frequently marginal to support this species. The predicted decrease in dissolved oxygen will result in degradation of the available habitat and possibly loss of this habitat. In addition, Savannah Harbor dissolved oxygen is frequently lower than the level needed to support a healthy aquatic community. The proposed project will further depress the existing low dissolved oxygen level.

Section 5 page 42, Section 7 page 27 and Section 9 page 4. The Natural Resources Mitigation plan is seriously flawed and the Service does not support the proposed plan. The Service has not agreed that details of the mitigation plan can be refined in the engineering and design phase. The Service believes a mitigation plan must be completed prior to completion of the final feasibility report and congressional authorization

Summary Comments

The predicted increase in salinity and decrease in dissolved oxygen would cause unacceptable impacts to nationally important fish and wildlife resources. Because of the scarcity and high value of the freshwater habitat and past cumulative impacts, any salinity increases in Savannah National Wildlife Refuge need to be avoided. The project would eliminate 42 percent (1170 acres) of remaining tidal freshwater marsh in Savannah National Wildlife Refuge and only 27 percent of the original refuge tidal freshwater marsh would remain. It is also likely that restoration of the naturally reproducing population of striped bass in the lower Savannah River would be precluded. To date, no effective mitigation measures for salinity and dissolved oxygen impacts have been identified. The proposed closure of Middle River is a high risk alternative which may cause more harm than good. The Service believes a mitigation plan must be completed prior to completion of the final feasibility report and congressional authorization. If deep water port development is pursued in Savannah low risk mitigation alternatives, such as release of flows from upstream Corps reservoirs, that would restore freshwater habitat and avoid any further salinity increases in Savannah NWR should be considered.

We will continue to work toward an acceptable resolution of these unresolved issues. However, because of these serious impacts and deficiencies, the Service cannot recommend forwarding this project to Congress for approval. Additionally, the Service is considering referral of this project to CEQ if these differences cannot be resolved.

Sincerely yours,

Sam D. Hamilton
Regional Director

Enclosure

Evaluation of the Ecological Study

In 1997, Applied Technology and Management conducted a study to address the potential effects of channel deepening on the tidal marshes of Savannah National Wildlife refuge. One purpose of Applied Technology and Management's effort was to document existing vegetation distributions. The sampling design used was appropriate for that effort. However, the coverage of the sampling transects was limited to the marsh perimeter along the main channels and did not appear to include the marsh interior (around secondary channels). Because the sampling technique differed from that used in the 1986-88 sampling effort, comparisons of particular sample sites can not be directly made, although trends can be compared. An effort should have been made to re-sample the 1986-88 sites to document this relationship and to include more of the marsh interior in their sampling.

Pie charts of vegetative species and proportions found in the marsh prior to the tide gate opening (1986-88) and after gate opening (1993-94) were included in documents by Pearlstine et al. (1990) and Latham and Kitchens (1996); these documents were available to ATM. We do not understand why these data were not used in a direct sample site comparison to look at documented changes. Additionally, procedures of vegetation clustering utilized in these studies should have been followed to identify community types existing in 1997, and also to further describe the vegetation groupings in comparison to those that were used in the Pearlstine et al. (1990) satellite image classification, community descriptions, and model predictions. If these data had been thoroughly examined, many of the conclusions drawn in the DEIS would have been different from those stated. For example, none of the methods used in the DEIS are comparable to the assessment of Pearlstine et al. (1990) that statistically derived species groups (freshwater, intermediate, brackish, subsaline), which were then used to describe the marsh during tide gate operation, and make model predictions for marsh change. The techniques used in the DEIS are based on species abundance and richness, not species-environment relationships, which are very important in detecting change, transitions, and intermediates that might exist and suggest change is occurring.

The DEIS misinterprets the composition of the marsh vegetation community groups (freshwater, intermediate, brackish, subsaline), inappropriately using a very limited interpretation of what these types are. If they had compared the pie charts of their 10 sample sites with those from Pearlstine et al. (1990) (Figure 4-1.3, which documents the species composition and mean relative importance of species in the 4 marsh types) and Latham and Kitchens (1996) (Figures 2-9, which are the same sites resampled during 1993-1994 and similarly summarized) they would have recognized that the extent of the freshwater marsh had increased. Much of this change had occurred by 1993-1994, all but 3 of the 1997 sample sites could be classified as freshwater. Table 1 was compiled from the pie charts from each sampling (1986-88, 1993-94, and 1997), as a "blind" comparison, i.e. without knowledge of the sample number and location in the marsh. The marsh types are freshwater (FW), intermediate (INT), brackish (B), and subsaline (S).

Species at each sample site and period are listed Table 2. Species in each vegetation class, as delineated in Pearlstine et al. (1990) from the detrended correspondence analysis and discriminant function analysis vegetation class identification and description, are listed in Table 3. These class descriptions also apply to the classes used in the model predictions. The data in the tables show that there actually has been change in vegetation composition throughout the marsh from freshwater-intermediate-brackish-subsaline to predominately freshwater (sites 1, 4-9) with an area of intermediate-freshwater mix (site 10), intermediate (site 3), and brackish (site 2) marsh. These changes were already evident in 1993-1994, when the sampled areas had changed from subsaline, brackish, freshwater/intermediate, and freshwater, to brackish/subsaline, intermediate, freshwater, and freshwater, as these classes are described in Pearlstine et al. (1990) and Table 3.

Because the belt transect sampling technique used to sample the vegetation in 1997 is likely to encounter a greater number of species than the small, circular plots used in 1986-88 and 1993-94, comparisons based on species number and importance values should be used cautiously. The more species you encounter, the smaller each proportion must be, and the distribution approaches the lognormal (Whittaker 1965). Species dominance-diversity curves were discussed by Whittaker (1965) as a way to assess patterns of niche differentiation in a community, and are intended to represent a *range* of intergrading types. The varied forms of the curves represent relationships (such as competition) of species in communities, and they are not necessarily exclusive. That is, they may overlap along environmental gradients, and gradual change of population densities along the gradients means the community compositions change gradually and continuously along the gradient. The result eventually is dissociations of species to escape the direct competition. With this in mind, and the fact that labeling the curves as one type or another can be subjective, the 4 resampled (in 1986-88 and 1997) quadrat curves could be labeled as follows:

Quadrat Number	Curve Type in 1986-1988	Curve Type in 1997
8	Freshwater	Freshwater
4	Intermediate	Freshwater
3	Brackish	Freshwater
4	Subsaline	Subsaline

and the other quadrats from 1997 could be labeled as:

Quadrat Number	Curve Type in 1997
1	Freshwater
5	Intermediate
6	Freshwater
7	Brackish/Intermediate
9	Freshwater
10	Intermediate

Although this does not indicate as extensive a shift in marsh types as comparing the species proportions in pie charts, it does show change has occurred to a greater extent than suggested in the DEIS Figure 40. This agrees with changes apparent on the satellite imagery classification that were not recognized in the DEIS and follows the trends suggested from the class composition comparisons in Tables 1 and 2.

Additional evidence of marsh change is presented in the discussion of Species Comparisons between Different Quadrat Areas (4.10.3.4). Similarity coefficients were calculated among quadrat pairs to determine if there were general species associations across the sampled system. If the quadrats are grouped as indicated in Figure 39 (group 1=Q2; group 2=Q10, 5, 3, 4, 7; group 3=Q1; group 4=Q6,8,9) the species compositions follow the groupings for vegetation classes in Pearlstine et al. (1990) and Table 3. Thus group 1 represents a brackish community, group 2 represents a freshwater / intermediate mix community, and groups 3 and 4 represent freshwater communities. Again this represents a change from 1986-88, when these groups would have been subsaline (group 1), brackish (group 2), intermediate (group 3), and freshwater (group 4), respectively, based on the types assigned to the 1986-88 sample sites. These conclusions are further corroborated by comparisons of the classified satellite imagery from both intervals.

Comparison of satellite imagery classifications also indicate the marsh has changed and continues to be in transition to a freshwater system, contrary to conclusions drawn in the DEIS. Marshes in the 1987 image classification followed a trend from subsaline to freshwater, with species proportions changing as indicated in Table 3. The succession model developed by Pearlstine et al. (1990) predicted 1987 marsh class distributions in fairly good agreement with the classified map (75%) in 1987. In the mis-classified area of the marsh (east of Argyle Island below highway 17), the system salinities represented a subsaline type, so the model classified it as such, while the standing vegetation was delineated as brackish in the image classification. The marsh vegetation communities delineated in the 1997 classification are also in fairly good agreement with model predictions of marsh community distributions following tide gate decommissioning, if the same classification groups as detailed in Table 3 are used in the 1997 effort. The freshwater marsh type predicted in the “tide gate not operating” condition of the model extends southward across most of Argyle Island and transitions to intermediate marsh south of New Cut. In the 1997 classification, if the species are similarly grouped into comparable classes as identified in Tables 2 and 3, Argyle Island to Rifle Cut is primarily freshwater marsh, from Rifle Cut south to New Cut is freshwater-intermediate mix, and from New Cut south to Highway 17 Intermediate to brackish marsh. This is a substantial change from the “tide gate operating” vegetation classification and model prediction of 1987, when freshwater marsh existed only at the north end of Argyle Island, intermediate marsh occurred from Lucknow Canal to Rifle Cut, brackish marsh covered from Rifle Cut to New Cut, and subsaline marsh existed from New Cut to the tide gate. The error in interpretation indicates the transitional and intergrading compositions of communities undergoing successional change was ignored in an effort to assign single, dominant species labels to the types.

It is unclear from the documentation just how the classification comparison was done and just what would constitute "dramatic change" in the marsh. A one-to-one raster or grid-cell based comparison could have been made between the marsh classifications (with and without the tide gate) and the model predictions (with and without the tide gate) using maps coded with the same classification schemes (such as that outlined in Table 3; this is possible since both time periods included common marsh types in the classifications). A difference or disagreement map indicating change in type could have been produced which would illustrate the changes discussed above that are recognizable in a visual comparison of the maps and model output. The method should be documented, as well as a more-detailed discussion of the classification procedures and a classification accuracy assessment. The later is particularly important, given the transitional nature of the marshes, which ATM recognized was complicating the classification effort.

Table 1. Comparison of site compositions for areas sampled during 1986-88, 1993-1994, and 1997, and predications of marsh types at these sites with changes expected after tide gate decommissioning, from Pearlstine et al. (1990). Note confirmation of marsh type conversion from more saline to intermediate/brackish to freshwater at sites 2, 3, 4, and 8.

ATM Site #	1986-1988 with-gate sampled site community type	1986-1988 with-gate sampled site species #	1986-1988 with-gate model prediction	1986-1988 without-gate model prediction	1993-1994 site community type	1993-1994 sampled site species #	1997 site community type	1997 site sampled site species #	Changed from 1986-1988 to 1997 (based on model prediction of site in 1986-1988)
1	unk[a]	unk	INT	FW	unk	unk	FW	33	yes
2	S	6	S	INT/B	B/S	6	B	7	yes
3	B	6	S	FW	INT	8	INT	22	yes
4	FW/INT	10	B	FW	FW	14	FW	18	yes
5	unk	unk	B	FW	unk	unk	FW	23	yes
6	unk	unk	INT	FW	unk	unk	FW	43	yes
7	unk	unk	off map	off map	unk	unk	FW	18	no
8	FW	22	FW	FW	FW	22	FW	58	no
9	unk	unk	FW	FW	unk	unk	FW	36	no
10	unk	unk	B	FW	unk	unk	FW/INT	18	yes

[a] Site data for 1986-88 and 1993-94 are available only for sites 2, 3, 4, and 8.

Table 2. The 15 dominant species and percent of total sample recorded at each sample site and sample period. Percentages were not given in the documentation of sampling conducted in 1986-1988 and 1993-1994; these values are estimated from pie charts in the sample reports. Species that were recorded in more than one sample period are listed on the same table line to facilitate comparison. *Eleocharis montevidensis* and *Eleocharis fallax* are listed on the same line. Although six sites were sampled only in 1997, they are listed so that comparisons can be made with class descriptions listed in Table 3.

ATM Site #	Species Recorded in 1986-1988	Estimated Percent of Total Sample in 1986-1988	Species Recorded in 1993-1994	Estimated Percent of Total Sample in 1993-1994	Species Recorded in 1997	Percent of Total Sample in 1997
1	not sampled		not sampled		Eleocharis fallax	18.36
					Zizaniopsis miliacea	16.41
					Aster elliotii	13.33
					Scirpus validus	9.20
					Leersia oryzoides	8.61
					Polygonum punctatum	8.30
					Ludwigia leptocarpa	4.29
					Eleocharis quadrangulata	2.65
					Murdannia keisak	2.22
					Cyperus haspan	1.95
					Hydrocotyle umbellata	1.75
					Xyris iridifolia	1.56
					Agalinis purpurea	1.40
					Alternanthera philoxeroides	1.29
					Bidens mitis	1.05
					18 species	7.63

ATM Site #	Species Recorded in 1986-1988	Estimated Percent of Total Sample in 1986-1988	Species Recorded in 1993-1994	Estimated Percent of Total Sample in 1993-1994	Species Recorded in 1997	Percent of Total Sample in 1997
2	Spartina alterniflora	50	Spartina alterniflora	20	Spartina alterniflora	16.82
	Scirpus validus	30	Scirpus validus	40	Scirpus validus	18.74
	Spartina cynosuroides	10	Spartina cynosuroides	5	Spartina cynosuroides	7.45
	Scirpus robustus	10	Scirpus robustus	10	Scirpus robustus	20.6
	Typha angustifolia	<1	Typha angustifolia	10	Typha angustifolia	25.35
			Zizaniopsis miliaceae	15	Aster tenuifolius	10.85
					Pluchea odorata	0.19
3	Scirpus validus	50	Scirpus validus	35	Scirpus validus	38.92
	Scirpus robustus	10				
	Spartina alterniflora	15	Spartina alterniflora	5	Spartina alterniflora	8.14
	Typha angustifolia	10	Typha angustifolia	5	Typha angustifolia	0.83
	Zizaniopsis miliaceae	10	Zizaniopsis miliaceae	25	Zizaniopsis miliaceae	13.32
	Eleocharis montevidensis	5			Eleocharis fallax	1.79
			Aster tenuifolia	15		
			Polygonum purpurescens	<1		
			Saggitaria lancifolia	10	Saggitaria lancifolia	7.38
			Saggitaria latifolia	5		
					Eleocharis cellulosa	7.04
					Polygonum punctatum	6.21

ATM Site #	Species Recorded in 1986-1988	Estimated Percent of Total Sample in 1986-1988	Species Recorded in 1993-1994	Estimated Percent of Total Sample in 1993-1994	Species Recorded in 1997	Percent of Total Sample in 1997
					Scirpus pungens	5.24
					Bidens laevis	4.55
					Spartina cynosuroides	2.00
					Pluchea odorata	1.10
					Amaranthus cannibinus	0.76
					Pluchea rosea	0.69
					Lilaeopsis chinensis	0.69
					7 species	1.33
4	Scirpus validus	15	Scirpus validus	20	Scirpus validus	19.34
	Saggitaria lancifolia	25	Saggitaria lancifolia	2	Saggitaria lancifolia	0.06
	Polygonum purpurescens	10	Polygonum purpurescens	15		
	Zizaniopsis miliaceae	15	Zizaniopsis miliaceae	20	Zizaniopsis miliaceae	24.57
	Typha angustifolia	5	Typha angustifolia	2		
	Eleocharis montevidensis	15	Eleocharis montevidensis	10	Eleocharis fallax	9.20
	Osmunda sp.	10				
	Eleocharis quadrangulata	<1	Eleocharis quadrangulata	2	Eleocharis quadrangulata	1.43
	Aster tenuifolius	<1			Aster tenuifolius	0.17
	Mikania scandens	5	Mikania scandens	5		
			Typha latifolia	<1		
			Scirpus robutus	2		

ATM Site #	Species Recorded in 1986-1988	Estimated Percent of Total Sample in 1986-1988	Species Recorded in 1993-1994	Estimated Percent of Total Sample in 1993-1994	Species Recorded in 1997	Percent of Total Sample in 1997
			Salix carolinina	15		
			Saggitaria latifolia	2		
			Hydrocotyle umbellatum	5		
			Galium tinctorium	<1		
					Polygonum punctatum	19.89
					Aster elliotii	10.30
					Bidens laevis	8.60
					Panicum hemitomon	2.98
					Eleocharis cellulosa	1.87
					Pluchea odorata	0.66
					Cyperus strigosus	0.22
					Amaranthus cannabinus	0.17
					Pontedaria cordata	0.17
					Spartina cynosuroides	0.17
					2 species	0.22
5	not sampled		not sampled		Scirpus validus	33.89
					Eleocharis fallax	21.87
					Zizaniopsis miliacea	12.68
					Pluchea odorata	5.39
					Polygonum punctatum	4.88
					Bidens laevis	3.28
					Aster tenuifolius	3.21
					Saggitaria lancifolius	3.06

ATM Site #	Species Recorded in 1986-1988	Estimated Percent of Total Sample in 1986-1988	Species Recorded in 1993-1994	Estimated Percent of Total Sample in 1993-1994	Species Recorded in 1997	Percent of Total Sample in 1997
					Hydrocotyle umbellata	2.99
					Typha angustifolia	2.7
					Altrenanthera philoxeroides	1.6
					Lilaeopsis chinensis	1.31
					Baccharis halimifolia	1.09
					Spartina alterniflora	0.51
					Zizania aquatica	0.36
					Juncus effusus	0.29
					7 species	0.89
6	not sampled		not sampled		Eleocharis fallax	22.27
					Zizanopsis milaecea	20.14
					Scirpus validus	12.99
					Aster elliotii	9.55
					Polygonum punctatum	7.86
					Murdannia keisak	6.5
					Osmunda regalis	2.29
					Myrica cerifera	2.18
					Zizania aquatica	1.69
					Luziola fluitans	1.36
					Eleocharis cellulosa	1.15
					Mikania scandens	1.04
					Panicum rigidulum	0.98
					Xyris iridifolia	0.98

ATM Site #	Species Recorded in 1986-1988	Estimated Percent of Total Sample in 1986-1988	Species Recorded in 1993-1994	Estimated Percent of Total Sample in 1993-1994	Species Recorded in 1997	Percent of Total Sample in 1997
					Cyperus haspan	0.98
					28 species	8.04
7	not sampled		not sampled		Bidens laevis	22.56
					Zizaniopsis miliacea	17.84
					Polygonum punctatum	17.78
					Scirpus validus	16.01
					Aster elliotii	8.15
					Peltandra virginica	5.49
					Spartina cynsuroides	2.95
					Aster sp.	1.95
					Cicuta mexicana	1.95
					Eleocharis elongata	1.54
					Typha angustifolia	1.30
					Ptilimnium costatum	1.00
					Scirpus robustus	0.65
					Amaranthus cannabinus	0.35
					Lilaeopsis chinensis	0.12
					3 species	0.36
8	Zizaniopsis miliaceae	30	Zizaniopsis miliaceae	15	Zizaniopsis miliaceae	11.62
	Typha latifolia	2				
	Scirpus validus	10	Scirpus validus	15	Scirpus validus	0.23
	Salix caroliniana	3				

ATM Site #	Species Recorded in 1986-1988	Estimated Percent of Total Sample in 1986-1988	Species Recorded in 1993-1994	Estimated Percent of Total Sample in 1993-1994	Species Recorded in 1997	Percent of Total Sample in 1997
	Pontederia cordata	2				
	Leersia sp.	<1				
	Mikania scandens	<1	Mikania scandens	5	Mikania scandens	0.38
	Polygonum spp.	2				
	Galium tinctorium	2			Galium tinctorium	2.04
	Eleocharis quadrangulata	2	Eleocharis quadrangulata	1		
	Eleocharis montevidensis	25	Eleocharis montevidensis	15	Eleocharis fallax	12.20
	Aster tenufolius	10	Aster tenufolius	1		
	A. keisiak	1			Murdannia keisak	6.62
	9 species	10				
			Typha angustifolia	5	Typha angustifolia	0.04
			Saggitaria lancifolia	25	Saggitaria lancifolia	0.08
			Polygonum purpurescens	10		
			Osmunda sp.	7	Osmunda regalis	1.19
					Agalinis purpurea	5.77
					Leersia oryzoides	5.47
					Ipomoea saggitata	5.12
					Aster elliottii	5.00
					Alnus serrulata	4.97
					Dulichium arrundinaceum	4.04
					Cyperus haspan	3.77
					Aster subulatus	2.81

ATM Site #	Species Recorded in 1986-1988	Estimated Percent of Total Sample in 1986-1988	Species Recorded in 1993-1994	Estimated Percent of Total Sample in 1993-1994	Species Recorded in 1997	Percent of Total Sample in 1997
					Leersia hexandra	2.54
					Ptilimnium costatum	2.42
					Onclea sensibilis	2.16
					Xyris iridifolia	2.08
					37 species	19.45
9	not sampled		not sampled		Zizaniopsis miliaceae	38.04
					Polygonum punctatum	11.49
					Aster elliottii	10.56
					Onoclea sensibilis	10.40
					Osmunda regalis	4.35
					Cicuta mexicana	2.87
					Polygonum arifolium	2.87
					Saururus cernuus	2.17
					Bidens laevis	1.94
					Eleocharis fallax	1.48
					Robus betulifolius	1.32
					Myrica cerifera	1.32
					Persea palustris	1.16
					Baccharis halimifolia	1.01
					Pontederis cordata	0.78
					21 species	8.24
10	not sampled		not sampled		Scirpus validus	35.98
					Zizaniopsis miliaceae	26.18

ATM Site #	Species Recorded in 1986-1988	Estimated Percent of Total Sample in 1986-1988	Species Recorded in 1993-1994	Estimated Percent of Total Sample in 1993-1994	Species Recorded in 1997	Percent of Total Sample in 1997
					Typha angustifolia	13.05
					Eleocharis fallax	5.21
					Alternanthera philoxeroides	3.89
					Polygonum punctatum	3.42
					Aster tenuifolius	2.49
					Spartina alterniflora	1.86
					Polygonum arifolium	1.86
					Pluchea odorata	1.71
					Bidens laevis	1.63
					Peltandra virginica	0.70
					Amaranthus cannabinus	0.62
					Saggitaria lancifolia	0.39
					Iris hexagona	0.39
					3 species	0.63

Table 3. Species composition of freshwater, intermediate, brackish, and subsaline sites (from Pearlstine et al. 1990) for clarification of the Pearlstine et al. (1990) model classification.. These proportions were used as descriptions of the classes in delineating vegetation model predictions, and the summary presented in Table 1 in this document. Note the complex assemblages and overlap of species between these types which were delineated statistically in Pearlstine et al. (1990), in contrast to the simplistic interpretation of the model output in the DEIS.

Freshwater Marsh Species	Proportion of Plots Occupied by Species in Freshwater Marsh	Intermediate Marsh Species	Proportion of Plots Occupied by Species in Intermediate Marsh	Brackish Marsh Species	Proportion of Plots Occupied by Species in Brackish Marsh	Subsaline Marsh Species	Proportion of Plots Occupied by Species in Subsaline Marsh
Salix caroliniana	8						
Zizaniopsis miliaceae	17	Zizaniopsis miliaceae	19	Zizaniopsis miliaceae	17		
Elecharis montevidensis	11	Elecharis montevidensis	20				
Scirpus validus	12	Scirpus validus	29	Scirpus validus	37	Scirpus validus	23
Scirpus robustus	3					Scirpus robustus	30
Typha latifolia	4						
Aster elliottii	4						
A. kesiak	7						
Saggitaria spp.	3						
Eleocharis	6						

Freshwater Marsh Species	Proportion of Plots Occupied by Species in Freshwater Marsh	Intermediate Marsh Species	Proportion of Plots Occupied by Species in Intermediate Marsh	Brackish Marsh Species	Proportion of Plots Occupied by Species in Brackish Marsh	Subsaline Marsh Species	Proportion of Plots Occupied by Species in Subsaline Marsh
quadrangulat a							
Galium tinctorium	3						
L. virginica	7						
Polygonum spp.	3						
15 species	12						
		Typha angustifolia	22	Typha angustifolia	37		
		Polygonum purpurescens	3				
		Saggitaria lancifolia	2	Saggitaria lancifolia	6		
		3 species	5				
				4 species	3		
						Spartina cynosuroides	4
						Spartina alterniflora	39
						2 species	4

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Letter response

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Atlanta, Georgia 30345

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1. COMMENT: Because of a lack of modeling data needed for impart analysis, the lack of an acceptable mitigation plan, and serious fish and wildlife resource concerns discussed below, we cannot provide a completed report pursuant to the Fish and Wildlife Coordination Act at this time.

RESPONSE: Although the USFWS felt it could not provide a Coordination Act Report at this time, their views were made known during the course of the study through the following means: (a)participation in the Technical Advisory Group for the hydrodynamic model, (b)participation in the Natural Resources Advisory Group, (c)provision of Planning Aid Letters, and (d)discussions during informal coordination on the conduct of the study.

General DEIS Comments

2. COMMENT: The USFWS believes the draft statement omits significant information needed to fully evaluate environmental impacts of the proposed project. In November of 1997, the Service recommended that the hydrodynamic (salinity) model be run at the two, four, six, and eight foot alternatives so environmental impacts of each alternative could be properly evaluated. GPA decided to run the model at only the eight foot alternative even though engineering and economic analyses were performed at two foot intervals. The Service believes the lack of model results on salinity and dissolved oxygen impacts for the two, four, and six foot alternatives make it impossible to conduct an informed alternatives analysis. GPA believes water quality impacts of deepening are linear but no data supports that assumption.

RESPONSE: The proposed scope of the DEIS was stated as a "worst case scenario" addressing the potential impacts of the deepest alternative, a 50 foot channel. All other alternative project depths would have less impact.

3. COMMENT: In February 1998, the Service recommended that additional model runs targeted toward mitigation evaluation be completed prior to determining the selected alternative. Subsequently, specific recommendations on model runs needed for analysis of mitigation alternatives were provided to GPA. To date, recommended

model runs have not been completed. The resulting lack of information makes correct formulation and evaluation of mitigation alternatives impossible. Specifically, we are concerned that predicted salinity increases may preclude restoration of the lower Savannah River striped bass population by decreasing the small amount of remaining suitable habitat. Mitigation model runs for Back River restoration need to be performed prior to determination of the selected alternative. With this data, the Service could estimate the impacts of harbor deepening in conjunction with restoration/mitigation efforts. By doing so, we could assess overall impacts to striped bass habitat.

RESPONSE: GPA has responded to the earlier comments by continued coordination and presentation of further model calibration and applications as requested by the Natural Resource Agency Group. The results of this further work are presented in the referenced modeling report and summarized in the FEIS. In addition, further evaluations will be performed and coordinated with the resource agencies in the CED phase to develop the final mitigation plan.

4. COMMENT: Based on model data provided in the preliminary DEIS, we believe projected salinity increases in the lower Savannah River system will adversely impact fish and wildlife resources. Moderate incremental increases in the salinity level have become cumulatively significant as depth of the harbor has been repetitively increased over time. Potential impacts of the proposed deepening project must be considered in the context of these cumulative salinity impacts. Model results and analysis of existing data indicate harbor deepening would cause significant salinity incursion upstream in the Front River and Middle River, further adversely impacting Savannah National Wildlife Refuge. An increased salinity level would adversely impact freshwater wetlands and striped bass habitat on and near Savannah National Wildlife Refuge.

RESPONSE: As part of the DEIS development the historic changes to the system from 1987 to the present were evaluated. This evaluation looked at the salinity changes which occurred due to the removal of the tide gate and the changes which occurred due to the last deepening. This study quantified where the system was in 1987 and other studies quantified where it would be after the proposed deepening. Along the Little Back River above the US17 bridge where some of the most critical freshwater habitats exist the salinities even after the proposed deepening would be far less than what existed in 1987. Along the Front River, the removal of the tide gate significantly altered the salinity regime such that on an average basis the salinity concentrations went down while the maximums increased. This meant that the system went from longer duration events above 0.5 ppt to shorter duration events with higher peaks. The deepenings in comparison do cause salinities to be higher but these increases are small in comparison to the dramatic change caused by the tide gate. Any evaluation of changes in salinity caused by the proposed deepening must be examined in light of the dramatic changes which the removal of the tide gate created.

5. COMMENT: Tidal fresh marsh on the Savannah NWR supports an extremely diverse plant community providing food, cover and nesting habitat for a wide variety of wildlife species. Tidal freshwater marsh is relatively scarce in comparison to coastal brackish and salt marshes. Because of this scarcity and its high fish and wildlife value, a primary Service goal is to restore and maintain tidal freshwater marsh in the lower Savannah River. Past harbor modifications, including deepening, have greatly increased salinity levels throughout much of Savannah NWR and reduced the quantity of tidal freshwater marsh. Savannah NWR contained about 6,000 acres of tidal freshwater marsh when established in 1927. By 1997, due to the cumulative impacts of harbor deepening, tidal freshwater marsh had declined to 2,800 acres, a reduction of 53 percent. Based on the location of the 0.5 ppt salinity contour at a flow of 8,200 cfs as provided for in the DEIS, the refuge would support about 1,630 acres of tidal freshwater marsh, Therefore after the proposed project, only a remnant (27 percent) of the original tidal freshwater marsh would remain.

RESPONSE: the surface salinity will be greater than 0.5 ppt. The other 50 percent of the time, the salinity will be less than 0.5 ppt. The 50 percentile salinity at 8,200 cfs was used as representative of an average condition that may be expected and was the subject of long discussion among the technical advisory group. While the 1,170 acre zone will be subject more frequently to salinities higher than 0.5 ppt, it is inappropriate to state that 1,170 acres of tidal freshwater marsh will be lost. Under various tide and river flow conditions, the area within the 1,170 acre zone certainly is already subjected to salinity levels above 0.5 ppt. The long-term effect the post-project change in salinity level frequency will have on the vegetative composition of the tidal freshwater marshes is a ripe subject for further study. Whatever the salinity effect may be, it is more likely to manifest itself as a subtle, long-term change than a conveniently quantifiable wholesale conversion of tidal freshwater marsh into an intermediate marsh. In addition, any changes in the marsh composition as a result of post-project induced salinity changes would occur against the backdrop of "natural" changes that would be occurring within the marshes even in the absence of the port project. Under no scenario would any tidal freshwater marsh be converted into saltwater marsh. In the next phase of the project it is proposed that the potential long-term effect of salinity values on marsh composition be more thoroughly studied. This study would include deployment of a network of salinity data loggers within the marsh and tidal channels to more precisely monitor the magnitude and variation of salinity values within the marshes. This study would be augmented with additional studies of other factors affecting marsh succession including substrate variability and water levels. These studies would be used to support development of a dynamic marsh succession model for use as a predictive and management tool.

6. COMMENT: Restoration of striped bass spawning and nursery habitat to support a self-sustaining Savannah River striped bass population is another primary Service goal. Prior to 1977, the Savannah River supported the most important striped bass population in the State of Georgia. Production of striped bass eggs in the Savannah River estuary has declined by about 95 percent since that time. Tidegate operation, in conjunction with the cumulative impacts of harbor deepening, caused a number of impacts, including increased salinity and loss of suitable spawning habitat throughout most of Little Back River and the lower Savannah River.

Striped bass eggs and larvae were also transported through New Cut and then rapidly downstream to areas with toxic salinity levels. It was hoped the Tidegate restoration project would improve conditions. Unfortunately, in spite of supplemental stocking and an increase in adult numbers, the striped bass population has not recovered as anticipated. The failure of recovery may be due, in part, to the cumulative impacts of harbor deepening. We believe that the salinity increases predicted by the model would preclude restoration of the lower Savannah River striped bass population.

RESPONSE: Egg transport studies on predicted future conditions, using additional model runs, will be discussed in the next phase of the DEIS. Although not required for the purposes of the EIS, the model could be used to examine existing factors and cumulative impacts that could be inhibiting restoration of striped bass population in the lower Savannah River.

7. COMMENT: Based on existing data and model predictions, low flow (less than 6,000 cfs) salinity would be eight to nine ppt in the Front River between river miles 21.5 and 24 and would be between five and eight ppt in the Middle River between river miles 22 and 24. We expect these predicted levels to be higher when the model is properly calibrated. This salinity level would be high enough to kill cypress and hardwood tree species common in the tidal forested wetlands, especially when the influence of storm surges is considered. Studies in Wilmington, North Carolina have documented the degradation of tidal forested wetlands due to salinity increases and water level changes associated with navigation channel deepening. In Wilmington, much of the forested wetland was converted to brackish marsh.

RESPONSE: can have a substantial effects on the composition of forested wetlands. While salinity is undoubtedly a factor, the contribution of water levels in bringing about changes in wetland composition can not be discounted. Forested freshwater swamps can be very sensitive to even small changes in average water levels. Long-term monitoring of forested swamps in Florida have documented excessive tree-mortality as a result of increased water levels (Orange County, Florida Eastern Service Area). In addition, the Southwest Florida Water Management District (Brooksville, Florida) recently completed a study of tree mortality of the Flatford Swamp, a mixed hardwood forested wetland in Manatee County, south of Tampa. The conclusion of this study was that the tree mortality was caused by increased dry season water levels resulting from increased agricultural water use in the swamp's upper watershed.

In both these examples dramatic tree mortality was caused by changes in water levels, without any involvement of salinity. The potential influence of water level on tree mortality was mentioned in the ecological study in the DEIS in reference to tree mortality along the Middle River. This loss of trees is documented in historic aerial photography of the project area and generally coincides with the past channel alterations. The relative contribution of salinity and water levels in this episode of tree mortality remains unexplored. In the next phase of the project it is proposed that historic salinity and water levels be modeled to more fully examine this combination of potential factors in determination of wetland succession in the refuge. This study would include deployment of a network of water-level data loggers within the marsh and tidal channels to more precisely monitor the magnitude and variation of water levels within the marshes in relation to the tides of the main river channels. This water-level monitoring network would be deployed in conjunction with more thorough survey of marsh elevations using GPS survey equipment.

8. COMMENT: Shortnose sturgeon habitat would also be adversely affected by the project. In the past, shortnose sturgeon have used the Kings Island Turning Basin as nursery and foraging habitat. Currently, dissolved oxygen levels in this area are frequently marginal to support this species. The predicted decrease in dissolved oxygen will result in degradation and possibly loss of this habitat. In addition, Savannah Harbor dissolved oxygen levels are frequently lower than the level needed to support a healthy aquatic community. The proposed project will further depress the existing low dissolved oxygen level.

RESPONSE: (2) Improve Habitat. The proposed project recommends that deep pockets be created in locations that are most likely to be favored by SNS during the summer month period. Given the uncertainty of responses to present conditions, and given the paucity of knowledge that we currently possess about the SNS's needs and habits the proposed habitat improvements are aimed at providing further assurances to the SNS's well-being. The proposal for deep pocket creation at Port Wentworth is subject to modification and improvement, upon discussion with agency and SNS specialists.

(3) Undertake Studies. Currently, no reliable database of the SNS population in the Savannah River exists. The current population dynamics in the Savannah River are not well known. The proposed project recommends funding a 5-year study that will develop such a database and will monitor the behavior of the SNS within the project areas. Hence, the study will also serve as a long-term control that would signal any future impacts and would thus create the basis for avoiding or stopping actions that pose a threat to the SNS.

In summary, the project proposes to avoid any decreases in DO that might have adverse impacts on SNS; to provide more habitat, and in the long run create a database for long term preservation efforts.

9. COMMENT: The DEIS does not adequately characterize the potential risk of contaminants in the dredged material to fish and wildlife during dredging activities or after placement of the material in a designated disposal area. Data from many of the analyses proposed in the Sampling and Analysis Plan (SAP) were not conducted or presented in the DEIS. Also, the inappropriate use of ecological risk assessment tools throughout the document makes the interpretations of the data presented in the DEIS inaccurate and misleading. The sediment and elutriate analyses presented show the presence of certain contaminants at levels associated with deleterious ecological impacts in all reaches proposed for dredging. Disturbance of sediments during dredging activities may liberate sediment-bound contaminants into the water column where they would be more biologically available to aquatic species. In addition, the presence of elevated contaminant concentrations in elutriate samples suggest that drainage from disposal areas may impact habitat quality in the receiving wetlands. Fish and wildlife use of the proposed upland disposal areas was underestimated resulting in an inaccurate assessment of potential wildlife exposure and risk due to the contaminants present in the dredged material. Alternatively, placement of certain material in the ODMDS may lead to further water quality impacts that may be detrimental to aquatic organisms. These concerns should be addressed before the plan is finalized and sent to Congress for approval.

RESPONSE: Ecological risk assessment tools were used appropriately and according to the best available information at the time of analysis and writing. The proper use of such tools, their limitations, etc. was also discussed in the DMEEE document. While the "presence of certain contaminants at levels associated with deleterious ecological impacts" were found "in all reaches proposed for dredging," these levels did not indicate that deleterious effects are likely for the proposed dredging and placement. In fact the analysis showed that the material is unlikely to cause unacceptable adverse impacts to the affected environment. SQAGs are screening values and were derived using statistical tools to correlate effects data with bulk chemistry. An exceedance of a threshold effects level was used to flag an analyte for further evaluation. Further evaluation did not indicate a likelihood that the proposed dredged material would create unacceptable adverse effects. Further assurances are required concerning the Savannah RACON/Light site and the potential for cadmium exceeding the LPC at the ODMDS if the dredging is undertaken without the required additional study recommended by the GPA and USACE. In terms of the existing project maintenance material, further evaluation may provide assurances concerning TBT, but this has little impact on the incremental potential of the proposed project. Additionally, GPA has offered to provide a more rigorous analysis of the bioaccumulative impact potential of organic compounds on terrestrial wildlife using the CDFs for foraging habitat. The results will be incorporated into the DMEEE, but the relatively low contaminant concentrations reported in the representative samples are unlikely to create unacceptable adverse impacts to avian species foraging these areas.

SQAGs derived using the weight-of-evidence approach are important tools for dredged material effects evaluations, but they are not criteria and they have several limitations. These include the quality of the data in the set used to generate the SQAGs; the variability of sediment sizes; variability of organic carbon concentrations and other factors affecting bioavailability; differing laboratory procedures and analytical techniques; different biological endpoints; and regional variabilities. The recent studies cited in the DMEEE by Dr. Long and others (Long et al., 1998a; Long et al., 1998b) provide useful information for using the SQAGs for toxicity potential predictions. For example, in the study with over 77 samples that were chosen to reflect large metals gradients, 0% of the samples were toxic when all of the metals concentrations were less than the probable effects levels (ERM/PEL). In all the representative sediments analyzed for this project, only the cadmium concentration reported at the wreck site 14 miles into the ocean exceeded a probable effects level. (Special procedures or further testing was recommended for handling this small volume of dredged material.)

The Inland Testing Manual states that "[m]aterial resuspended during normal dredging operations is considered 'de minimus' and is not regulated under Section 404 as a dredged material discharge." In situations where the dredged material contains contaminants at such high levels that resuspension may result in unacceptable adverse impacts, the potential impact of resuspension due to dredging can be addressed under NEPA. The evaluation of the sediments proposed for excavation from the Savannah Harbor for deepening are predominantly virgin sediments with high metal concentrations that were determined to be non-toxic using the currently available methods (especially SQAGs; ERL/TEL and ERM/PEL values). Numerous studies conducted on the relatively more contaminated the Savannah Harbor berths have shown that resuspended sediments at high suspended solids concentrations (i.e., sediments resuspended by agitation) did not produce measurable toxic effects.

A thorough and extremely conservative water column effects evaluation was conducted for constituents remaining in the water column in the CDF return water. Extensive modified elutriate preparation procedures were used, "total" instead of the "dissolved" concentrations recommended in USEPA guidance documentation were calculated and compared to State and federal WQS/WQC as appropriate using an appropriate mixing model. All of the water column issues have been thoroughly addressed in the DMEEE; no further evaluation is necessary.

The DMEEE will be revised to appropriately consider terrestrial wildlife pathways from bioaccumulative contaminants of concern (BCCs). The analysis will make use of the most up-to-date USEPA and USACE Supplemental procedures for terrestrial pathways analysis. BCCs will be selected from the larger project contaminants list detailed in the SAP that have octanol/water coefficients of greater than 10,000 (log Kow > 4). These chemicals tend to bioaccumulate up the food chain and may pose a threat to foraging birds using the CDFs. BCCs will first be screened against the lower sediment quality assessment guidelines (ERL or TEL values).

Theoretical bioaccumulation potentials (TBPs) will be calculated for the highest dw-normalized concentrations of BCCs exceeding threshold effects levels (MacDonald, 1994; Long et al., 1995) using an appropriate benthic organism for which biota-sediment accumulation factors (BSAFs) exist in the USACE database. TBPs will then be evaluated against FDA action levels for fish or shellfish (when available) according to procedures outlined in the ITM. For those BCCs remaining after screening, the theoretical benthic tissue toxin will be evaluated against a no observable effects food concentration calculated for an appropriate measurement endpoint.

10. COMMENT: The primary recommended mitigation measure, closure of Middle River, is a major modification of the lower Savannah River. No model results are provided to evaluate the hydrodynamic impacts of the proposed closure. We believe Middle River closure is a high risk mitigation measure that could cause significant adverse impact. We are concerned the plan would simply shift the salinity problem further up Front River, perhaps as far as McCoys Cut, and into Back River and Middle River. This action could also cause adverse changes in water level, sedimentation rate, current velocity and fish and wildlife movement in Back River and Middle River.

RESPONSE: The EIS will be revised to include additional modeling results which present the predicted salinity changes for the Middle River closure avoidance feature under various flow conditions. The result of the Middle River closure modeling indicates that salinity impacts would be avoided in the Middle and Back Rivers with some increase of salinity levels in the Front River. The EIS will be revised to include additional studies which will address the concerns noted and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

Specific DEIS Comments

11. COMMENT: Section 1 page 6. Studies are available that indicate a gradual return to tidal freshwater marsh following tide gate removal (Latham and Kitchens 1996). If properly interpreted, vegetation data from the DEIS corroborates this trend. The attached "Evaluation of the Ecological Study" provides a detailed analysis of the vegetation data.

RESPONSE: Please see Attachment A, Response to the Evaluation of the Ecological Report.

12. COMMENT: Section 3 page 1. The feasibility of closing off Middle River has not been established. While this action would reduce salinity intrusion in Middle River, it would also increase salinity intrusion in Front River. Impacts to tidal freshwater marsh would simply be shifted from Middle River to Front River.

Much of the striped bass reproduction that remains occurs in Front River. How much reproduction will recover in Back River is unclear.

Because this proposal would increase salinity in Front River, it could exacerbate impacts to striped bass habitat under current conditions. This action could also cause adverse changes in water level sedimentation rate, current velocity and fish and wildlife movement in Back River and Middle River and water quality at the City of Savannah water intake.

RESPONSE: The EIS will be revised to include additional modeling results which present the predicted salinity changes for the Middle River closure avoidance feature under various flow conditions. The result of the Middle River closure modeling indicates that salinity impacts would be avoided in the Middle and Back Rivers with some increase of salinity levels in the Front River. The EIS will be revised to include additional studies which will address the concerns noted and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

13. COMMENT: Section 4 pages 7-28. Differences in interstitial salinities in the marshes vs. water column salinities in the rivers have not been thoroughly discussed. If most of the sampling was done in main channels, how can extensions of baseline conditions be made to inner areas and secondary channels if these areas were not sampled? In the 1986-88 study, the marsh soil salinities reflected average high-tide channel salinities with the tide gate in operation. This was confirmed with concurrent sampling of water column salinities in the channels and interstitial marsh salinities. What kind of baseline project description of salinities can be made if the interstitial salinities were not sampled with channel water column salinities in 1997? Although the salinity model uses high tide condition to represent the marsh flooding period, the temporal extent of the salinity levels is not addressed in their description of current conditions, and the model grid does not extend beyond the main river channels, so predictions of changes to the baseline marsh levels (in sediments, outside of canals) may not be accurate.

RESPONSE: The ecological study in the DEIS relied on the methodology in the previous study (Pearlstine et al., 1990) and assumed the marsh soil salinities were the average of the high tide salinities. Despite the use of this assumption, however, soil salinity readings were taken at 110 locations throughout the study area. These soil salinity values were used in conjunction with the river channel salinity values to determine the location of the salinity contours used in delineating the zone of potential affect. In the next phase of the project, the relationship of marsh soil salinity and the high tide salinity will be tested by the placement of salinity data loggers within the marshes and secondary creeks. This sample scheme will allow more precise data collection within the marshes and a more robust analysis of correlation with high tide conditions in the main channels.

14. COMMENT: In the 1986-88 study, marsh water levels frequently exceeded river levels due to the marsh sediments' capacity to hold water. It was reported that the marsh water levels probably fluctuated less than the river water levels (1ft vs. 7ft in 1986-88), and that the marsh stage was not well-related to the river stage, possibly due to the time required for tidal water to cross the surface (slowed by interference by vegetation, water storage and sediment absorption). Marsh sediments remained saturated even when channel water levels were low. Measurements made in 1997 at Marsh sample 04A demonstrates the site retains saline water on the surface longer than in water measured at the bottom of the USFWS dock (Figure 3-23). The salinity of the sediments would probably be a high average of the marsh surface water that is standing, entering, and leaving. Estimations from the 1986-88 studies predicted that marsh sediments above the Highway 17 bridge required 2 months to reach freshwater salinity levels once the Tidegate was taken out of operation due to the long salinity retention properties of the sediments. Temporal and spatial relationships of these salinity levels need to be better defined so a more accurate assessment of potential impact to marsh vegetation can be made.

RESPONSE: In the next phase of the project, it is proposed that a salinity sampling scheme be installed within the marshes to more precisely correlate the relationship of soil salinity to marsh water column and river channel salinity levels.

15. COMMENT: Section 4 page 43. The statement that, "In the Savannah River and its tributaries, salinities were found to be below the lethal limit threshold for striped bass eggs" is incorrect. Portions of the river are now and have always been above the "lethal limit." The areas referenced are the traditional spawning grounds, which although below lethal levels, received enough salt water input as to become unattractive to spawning adults.

RESPONSE: Concur. The statement will be removed.

16. COMMENT: Section 4 page 52. The document should be more current information on manatee numbers in the Savannah River. Georgia DNR and South Carolina DNR have recent additional information. Also contact should be made with the Manatee Coordinator, USFWS, Jacksonville, FL (904) 232-2580.

RESPONSE: The document has been revised using current manatee sighting data received from Georgia DNR. Contact has been established with the Manatee Coordinator, Robert Turner (USFWS), so that the data set will be kept current.

17. COMMENT: Section 4 page 62. The statement that the existing navigation project is having no unacceptable impacts on shortnose sturgeon or its habitat is not well supported. There has been only limited research on shortnose sturgeon in the Savannah River. The existing navigation project may be impacting shortnose sturgeon through impacts on dissolved oxygen levels and salinity. The latest surveys show the population is skewed toward older individuals, indicating the shortnose sturgeon population may be impacted by the current project.

RESPONSE: Concur. The statement will be removed from the report, since the database for drawing such a conclusion does not exist. Removal, however, is simply an acknowledgement that no inference can be made at this time due to the paucity of field data.

18. COMMENT: Section- 4 page 64. Flatwoods salamander is a federally proposed threatened species.

RESPONSE: The BATES has been revised to evaluate potential project impacts on this species. Possible loss of habitat as a result of this type project would be creation of a dredge spoil site. However only existing dredge spoil sites will be used. No habitat that this species uses will be effected by the project action. Therefore, there would be no adverse effect on this species. There will be no habitat destroyed or affected that is determined to be critical for this species' survival.

19. COMMENT: Section 4 page 77. Available data indicate a gradual return to tidal freshwater marsh following Tidegate removal (Latham and Kitchens 1996). Analysis of remote sensing information in the DEIS and in earlier reports (Pearlstine et al 1990) indicates there has been a significant increase in the amount of tidal freshwater marsh and intermediate marsh since the Tidegate was taken out of operation. If properly interpreted, vegetation data from the DEIS corroborates this trend. The attached "Evaluation of the Ecological Study" provides a detailed analysis of the vegetation data. (EDITOR'S NOTE: Comments on this analysis are included as Comments # xxx through xxx.).

RESPONSE: Please see Attachment A, Response to the Evaluation of the Ecological Report.

20. COMMENT: Section 5 page 14. The wave model did not indicate significant erosion impacts. However, tidal currents may be more important in controlling beach erosion- Extending the entrance channel 25,000 feet may cause significant changes in coastal circulation patterns and tidal currents. This source of potential impact was evidently not investigated.

RESPONSE: The effect of the channel deepening on the local currents was addressed in Section 5.8. The WQMAP hydrodynamic model showed that the channel deepening would not increase currents in the Savannah River or the areas adjacent to the river mouth. Hence, the deepening should not increase current induced coastal erosion in the areas adjacent to the river mouth (i.e., the north end of Tybee Island). The channel extension lies beyond the hydrodynamic model grid boundaries. However, since the extension is greater than 43,000 feet from the Savannah River jetties and more than 34,000 feet from the Tybee Island shoreline, the channel extension would not induce changes in the currents near the shoreline. Therefore, the channel extension would not impact current induced beach erosion.

21. COMMENT: Section 5 page 16. The DEIS does not include modeling runs assuming closure of Middle River. The DEIS cannot be considered complete without this important information. Closure of Middle River is a major modification of the lower Savannah River. Modeling results are needed in the document to evaluate the positive and negative impacts of this alternative.

RESPONSE: The DEIS will be revised to include modeling results of the Middle River closure as requested by the resource agencies. In addition, further evaluations will be performed and coordinated with the resource agencies in the CED phase to develop the final mitigation plan.

22. COMMENT: Section 5 pages 17-25. The model grid in Figure 4-1 indicates the model does not cover the entire marsh surface. The "land" boundary condition, therefore, seems somewhat arbitrary and may not permit assessment of affects across the marsh. Cells along the primary feeder creeks off the Front River, Middle River, and Back River, are discussed. However, movement of water through the marsh and its sediments, which would probably have the effects of longest duration on the marsh salinity levels and subsequently vegetation communities there, is not discussed. More documentation is needed which demonstrates that model predictions are really representative of the marsh system, not just the main channels and rivers.

RESPONSE: The model grid does evaluate the individual marsh areas by defining an acreage of coverage associated with each feeder creek. Observation of the system during the field measurements identified that the primary mechanism for the filling and draining of the marshes is through the feeder creeks. The definition of the marshes which includes the coverage area allows the marshes to be filled and drained separately from the main feeder channels and the marshes do show a temporal response to the salinity filling and draining i.e. some level of lag. For this reason it is felt that the model accurately represents the inundation time in the marsh areas. Measurements made of the waters which fill and drain the marshes shows that these water closely mirror the main channel high tide salinities. To transpose the surface water salinities to the interstitial salinities the assumption made in the 1990 report entitled "Development and

Application of a habitat Succession Model for the Wetland Complex of the Savannah National Wildlife Refuge" was used. The report states "High salinities may be associated with elevation due to the correlation of river salinity with stage. Water reaches the marsh surface at high tide, stays on the surface of the marsh and infiltrates the sediment and peat, mixing with the stored water. The salinity of the sediment is thus a cumulative average of marsh surface water salinity". Our assumptions follow this.

23. COMMENT: Section 5 page 29. The document indicates the 90 percentile post project dissolved oxygen for about four river miles (RM 16.6-20.5) will be less than three (2.2-2.9) parts per million. The document should present minimum predicted dissolved oxygen levels at all river stations. The document should assess the impacts of low dissolved oxygen on the aquatic community because projected dissolved oxygen levels exceed lethal limits for some fish species.

RESPONSE: The dissolved oxygen within the system is highly dynamic and short duration events occur with very low dissolved oxygen levels. Given the short duration of these events along with the dynamic nature of the system it was felt that a statistical presentation of the percentiles was a better representation of the true impacts to the system. The 90th percentile was chosen as representing the extreme critical condition, i.e. 90 percent of the time the DO is above this level. In the CED phase additional DO model simulations will be made. The results of these simulations will be presented in the Tier II EIS. For this work additional, more critical, percentiles, say 95th etc could be presented. It is felt that absolute minimums may not be a good representation of the true impacts, an appropriately high percentile is a better value to present.

24. COMMENT: Section 5 page 33. The primary spawning grounds no longer include, "RM 21 and above in the Back River." These areas are the traditional historical spawning areas, but no longer host a significant amount of spawning activity.

RESPONSE: Concur. Presently the most productive spawning grounds are found in the Front River, RM 24.4 and greater. Section 5.5.1.3.1.4 discusses the effects on this area as a result the deepening project.

25. COMMENT: Section 5 page 33. The citation for the statement concerning "young-of-the-year" is incorrect. It should be attributed to Wallin et al. 1995.

RESPONSE: Concur. Corrected in DEIS.

26. COMMENT: Development time of eggs has been estimated at 44 hrs. in the prevailing water temperatures of the Savannah River (Bayless 1972). This was mentioned in Section 4 and probably should be mentioned here as well (in addition to or instead of the stated 36-40 hrs).

RESPONSE: Concur. The Bayless study (1972) was not mentioned in this section because of more current data on egg development time. The Bayless (1972) egg development time of 44 hours will be added to this section for completeness. Setzler's more recent study,1980, puts forward a development time of 36 to 40 hours, depending on water temperature. This egg development time has been adopted for the purposes of the DEIS.

27. COMMENT: The statement, "No eggs in the early stages of development were collected at sites where salinity exceeded 1.0 ppt." is misleading. There is no definition of, "early stage of development," and the cited report (Reinert et a]. 1996) describes capture of eggs in areas of salinity exceeding 1.0 ppt. The vast majority of eggs have been caught in areas where salinity was <1.0. samples were always taken on the ebb tide, so salinities were approaching daily minimums at each station, which may bias this assessment. Eggs probably do occur at higher salinities. However, their occurrence does not invalidate ATM's choice of critical condition for spawning (1.0 ppt). We suggest that 9 ppt also be examined, as this level has been accepted as the critical limit for survival and development (Winger and Lasier 1994).

RESPONSE: The DEIS has been emended to: "No..eggs in the early stages of development were collected at sites where salinity exceeded 1.0 ppt" (Wallin and Van Den Avyle September 1995, page 9). Description of (5 stage) egg development from Bayless (1972) may be found in Van Den Avyle (et al. 1990). Model runs will be used for egg transport studies in the next phase of the study. A salinity of 9 ppt (Winger and Lasier, 1994) is used by the DEIS, section 4.8.1.3, as the critical limit to egg survival and development.

28. COMMENT: Section 5 page 36. Maximum salinities are mentioned briefly in these sections. This variable is of great value and should have been presented more completely and thoroughly. Brief exposures to high salinity may have detrimental effects on egg and larval survival, thus making the maximum salinity in any portion of river an important variable.

RESPONSE: Maximum salinities are not used in the DEIS because a statistical representation was determined to better represent effects on biological organisms. Modeling report has examined these issues in Sections 4.1 page 4-1.

29. COMMENT: The discussion of Front River, RM 21.7, does not agree with the table on page 5-35. The 1 ppt condition is met between 60-70% of the time, not 40%, and the 1 ppt condition at RM 20.5 is met 40-50% of the time, not 20% as is stated.

RESPONSE: Concur. Corrected.

30. COMMENT: Section 5 page 38. The document states that the 1 ppt condition is exceeded at RM 24.4. Although this may be true, and might preclude spawning at this location, this station has been highly productive for egg capture. This means that spawning is occurring upriver of this action, and likely is not affected by salinity changes at that station. The greatest concern should not be the preclusion of spawning because of slightly higher salinity, but the fate of the eggs that are spawned. By increasing salinity at sites further down river, rearing habitat is pushed farther upriver and probably reduced overall. The concern seems to be with preserving. spawning habitat, which is admittedly a primary objective; however, increased egg production is meaningless if the eggs and larvae do not have a place to hatch and grow.

RESPONSE: Concur. Egg transport studies, using additional model runs, will be discussed in the next phase of the DEIS.

31. COMMENT: Section 5 page 39. Whether table 5-5 represents surface or bottom salinities is unclear. If the table represents bottom salinity, then changes in the Front River (RM 21.7 and 20.5) are on the order of 2-3 ppt in the 90th percentile. This is a significant change. Are these predictions for a well-mixed tide (i.e., the spring tide), when bottom conditions may be representative of conditions throughout the water column, or do they represent the stratified condition (i.e., the neap tide), when bottom conditions will be much saltier than conditions elsewhere in the water column? A presentation of surface conditions and bottom conditions would be appropriate.

RESPONSE: The projected salinities are for the bottom in Table 5-5, and the changes along the reach RM 20.5 and RM 21.7 are on the order of 2-3 ppt. These changes reflect the 90 percentile of all salinities at the bottom over a 30 day period. This period goes through two series of spring-neap cycles which are typically 14 days in duration. The table will be modified to state that these are bottom salinities. Bottom values are used as they represent the worst case conditions for salinity change and therefore the worst case for species impact.

32. COMMENT: Section 5 page 40. The change in the Front River 90th percentile is described as an increase of 0.2 ppt. This is incorrect. The tables indicate a change of 0.4 ppt.

RESPONSE: The change in salinity along the Front River depends upon your river mile location. Looking at this page of the DEIS the only mention of a 0.2 ppt change in the 90the percentile is for RM 24.4. The table does show the value at this location to be a change of 0.4 ppt not 0.2 ppt. This will be changed.

33. COMMENT: Section 5 page 4l. The statement, "The DO will be equal to or greater than the acceptable criterion 85 percent of the time as compared to 70 percent of the time in the existing condition" is wrong. Comparison of Tables 5-4 (p.38) and 4-6 (p.41) indicate no change in the 5.0 mg/l level of DO at this station. The critical dissolved oxygen condition is predicted to occur 70% of the time, same as the existing condition. The second statement about RM 14.5 also appears to be incorrect. None of the numbers in this statement correspond to the data presented in Table 4-6.

RESPONSE: Correction has been made in DEIS.

34. COMMENT: Section 5 - page 42. Striped bass egg transport to areas of high salinity would be affected by the project. The document fails to present data on the movement of the lethal/toxic salinity level (9.0 ppt, Winger and Lasier 1994). Tracking of the 9.0 ppt halocline would be appropriate and necessary to demonstrate the reduction in available habitat for hatching and rearing. The current problem of transport to toxic areas may be exacerbated by this project and thus needs to be investigated more thoroughly.

RESPONSE: In order to evaluate concerns of egg transport into toxic salinities, egg transport studies will be undertaken in the next phase of the DEIS.

35. COMMENT: Section 5 pave 54. The assumption is made that compensatory wetlands will be constructed in Steamboat River in conjunction with Middle River closure. We believe that Middle River closure may cause adverse impacts in the Savannah River system. It is premature to propose construction of wetlands at tills site. An alternate site needs to be identified.

RESPONSE: See Response to Comment #10 in USFWS letter dated June 22, 1998.

36. COMMENT: Section 5 pages 54-57. Because one of the DEIS's conclusions was that no change has occurred in the marsh since Tidegate removal, the impact of salinity increase was not considered significant. However, given the discussion in the attached "Evaluation of the Ecological Study", this conclusion is likely flawed, and the probability of loss of marsh undergoing conversion since the gate was taken out of operation is fairly certain. Although the species in this marsh demonstrate plasticity in their distributions to a range of salinities, a shift to a slightly more saline environment could cause shifts in the species distributions, dominance, and population densities, and a northward migration of the brackish-intermediate marsh and displacement or elimination of the freshwater marsh that has recovered since the Tidegate was taken out of operation.

RESPONSE: Please see Attachment A, Response to the Evaluation of the Ecological Report.

37. COMMENT: Figure 4-7. Some of the columns in this table appear to be misplaced or the data appears to be incorrect. The table, as presented, shows a positive deepening impact to dissolved oxygen.

RESPONSE: The data within these columns are not misplaced. There are areas where the pre- versus post-project dissolved oxygen does show improvement. This is due to the alteration of the system transport and the potential for transport of oxygen demanding material from one reach to another. If the project impacts cause material to remain in one reach for a longer period of time, the material may not reach other areas that were reached in the pre-project condition.

Specific Draft Feasibility Report Comments

38. COMMENT: Section 1 page 10. The Draft Economic Analysis completed in February 1998 indicated that the 46 foot depth was the NED plan while the Draft Feasibility Report indicates the 47 foot depth is the NED plan. The reason for this change should be explained.

RESPONSE: The Economic Appendix has been revised to support a NED and Recommended plan selection of a -48 foot project depth. GPA concurs with this selection and has selected the -48 foot project depth as the Locally Preferred Plan.

39. COMMENT: Section 1 page 13. The Natural Resources Mitigation plan is seriously flawed. Purchase of wetlands, without restoration or management improvement will have little value for mitigation In addition, little tidal freshwater marsh remains in the Savannah River system outside the Savannah National Wildlife Refuge. The feasibility of closing off Middle River has not been established. While this action would reduce salinity intrusion in Middle River, it would also increase salinity intrusion in Front River. Impacts to tidal freshwater marsh would simply be shifted from Middle River to Front River. Much of the remaining striped bass reproduction occurs in the Front River. How much reproduction will recover in the Back River is unclear. Because this proposal would increase salinity in Front River it could exacerbate impacts to striped bass habitat under current conditions. This action could also cause adverse changes in water level, sedimentation rate, current velocity and fish and wildlife movement in Back River and Middle River.

RESPONSE: See Response to Comment #10 in USFWS letter dated June 22, 1998.

40. COMMENT: Section 5 page 4. The document states that the inner harbor is not adequate for existing and projected larger vessels. However page 5-2 of the Draft Economics appendix states that the existing Port of Savannah is relatively comparable or advantaged to other ports in the south Atlantic. The latter statement either indicates the Port of Savannah is adequate at least for existing larger vessels or all south Atlantic ports are inadequate for existing larger vessels.

RESPONSE: The inner harbor is not adequate for efficient movement of the larger vessels of the future. Other southeastern US harbors are in similar situations.

41. COMMENT: Section 5 page 13 and Draft Economics Appendix Page 3-6. The document indicates a projected year 50 throughput for Savannah of over six million TEUs which is more than the existing Port of Long Beach. Is this assumption valid given the respective size of the hinterland served and the potential to provide the necessary land side facilities? This is also about 10 times the existing throughput at Savannah. The report should provide information on how much throughput existing container cranes and berths could accommodate. The report should also determine how many additional berths and cranes would be needed and their locations.

RESPONSE: The number of TEUs expected in the future are based on the size and economy of the presently served hinterland. Improvements in the landside facilities are assumed to occur in response to the growth in the region's economy. Improvements in the efficiency of cargo handling operations are expected in the future, but cannot be accurately quantified at this time.

42. COMMENT: Section 5 page 42. Available vegetative data indicate a gradual return to tidal freshwater marsh following Tidegate removal (Latham and Kitchens 1996). Analysis of the remote sensing information in the DEIS and in earlier reports (Pearlstine et al 1990) indicates a significant increase in the amount of tidal freshwater marsh and intermediate marsh since the Tidegate was taken out of operation. This indicates a significant recovery of tidal freshwater marsh since removal of the Tidegate.

RESPONSE: Please see Attachment A, Response to the Evaluation of the Ecological Report.

43. COMMENT: Shortnose sturgeon habitat would also be adversely affected by the project. In the past, shortnose sturgeon have used the Kings Island Turning Basin as nursery and foraging habitat. Dissolved oxygen levels in this area under current conditions are frequently marginal to support this species. The predicted decrease in dissolved oxygen will result in degradation of the available habitat and possibly loss of this habitat. In addition, Savannah Harbor dissolved oxygen is frequently lower than the level needed to support a healthy aquatic community. The proposed project will further depress the existing low dissolved oxygen level.

RESPONSE: The proposed project will take steps to avoid, through mitigation, DO decreases that would cause adverse impacts to the SNS. In addition the project will fund long-term studies to ascertain any potential adverse impacts to SNS and these studies will serve as early warning controls for avoiding or correcting any future impacts. Furthermore, the project proposes to undertake habitat improvement measures upon concurrence from the appropriate agencies.

44. COMMENT: Section 5 page 42, Section 7 page 27 and Section 9 page 4. The Natural Resources Mitigation plan is seriously flawed and the Service does not support the proposed plan. The Service has not agreed that details of the mitigation plan can be refined in the engineering and design phase. The Service believes a mitigation plan must be completed prior to completion of the final feasibility report and congressional authorization.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

45. COMMENT: The predicted increase in salinity and decrease in dissolved oxygen would cause unacceptable impacts to nationally important fish and wildlife resources. Because of the scarcity and high value of the freshwater habitat and past cumulative impacts, any salinity increases in Savannah NWR need to be avoided. The project would eliminate 42 percent (1170 acres) of remaining tidal freshwater marsh in Savannah NWR and only 27 percent of the original refuge tidal freshwater marsh would remain. It is also likely that restoration of the naturally reproducing population of striped bass in the lower Savannah River would be precluded. To date, no effective mitigation measures for salinity and dissolved oxygen impacts have been identified. The proposed closure of Middle River is a high risk alternative which may cause more harm than good. The Service believes a mitigation plan must be completed prior to completion of the final feasibility report and congressional authorization. If deep water port development is pursued in Savannah low risk mitigation alternatives, such as release of flows from upstream Corps reservoirs, that would restore freshwater habitat and avoid any further salinity increases in Savannah NWR should be considered.

RESPONSE: Section 5.7.3 of the DEIS explains that the zone of potential impact to freshwater marsh only includes the area of marsh which was previously affected by operation of the tidegate. As a result, the existing vegetation is not expected to be adversely changed. The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

46. COMMENT: We will continue to work toward an acceptable resolution of these unresolved issues. However, because of these serious impacts and deficiencies, the Service cannot recommend forwarding this project to Congress for approval. Additionally, the Service is considering referral of this project to CEQ if these differences cannot be resolved.

RESPONSE: GPA will continue to work with the USFWS during the CED phase to more completely resolve these issues.

Evaluation of the Ecological Study

47. COMMENT: In 1997, Applied Technology and Management conducted a study to address the potential effects of channel deepening on the tidal marshes of Savannah NWR. One purpose of Applied Technology and Management's effort was to document existing vegetation distributions. The sampling design used was appropriate for that effort. However, the coverage of the sampling transects was limited to the marsh perimeter along the main channels and did not appear to include the marsh interior (around secondary channels). Because the sampling technique differed from that used in the 1986-88 sampling effort, comparisons of particular sample sites can not be directly made, although trends can be compared. An effort should have been made to re-sample the 1986-88 sites to document this relationship and to include more of the marsh interior in their sampling.

Pie charts of vegetative species and proportions found in the marsh prior to the tide gate opening (1986-88) and after gate opening (1993-94) were included in documents by Pearlstine et al. (1990) and Latham and Kitchens (1996); these documents were available to ATM. We do not understand why these data were not used in a direct sample site comparison to look at documented changes. Additionally, procedures of vegetation clustering utilized in these studies should have been followed to identify community types existing in 1997, and also to further describe the vegetation groupings in comparison to those that were used in the Pearlstine et al. (1990) satellite image classification, community descriptions, and model predictions. If these data had been thoroughly examined, many of the conclusions drawn in the DEIS would have been different from those stated.

For example, none of the methods used in the DEIS are comparable to the assessment of Pearlstine et al. (1990) that statistically derived species groups (freshwater, intermediate, brackish, subsaline), which were then used to describe the marsh during tide gate operation, and make model predictions for marsh change. The techniques used in the DEIS are based on species abundance and richness, not species-environment relationships, which are very important in detecting change, transitions, and intermediates that might exist and suggest change is occurring.

The DEIS misinterprets the composition of the marsh vegetation community groups (freshwater, intermediate, brackish, subsaline), inappropriately using a very limited interpretation of what these types are. If they had compared the pie charts of their 10 sample sites with those from Pearlstine et al. (1990) (Figure 4-1.3, which documents the species composition and mean relative importance of species in the 4 marsh types) and Latham and Kitchens (1996) (Figures 2-9, which are the same sites resampled during 1993-1994 and similarly summarized) they would have recognized that the extent of the freshwater marsh had increased. Much of this change had occurred by 1993-1994, all but 3 of the 1997 sample sites could be classified as freshwater. Table 1 was compiled from the pie charts from each sampling (1986-88, 1993-94, and 1997), as a "blind" comparison, i.e. without knowledge of the sample number and location in the marsh. The marsh types are freshwater (FW), intermediate (INT), brackish (B), and subsaline (S). Species at each sample site and period are listed Table 2. Species in each vegetation class, as delineated in Pearlstine et al. (1990) from the detrended correspondence analysis and discriminant function analysis vegetation class identification and description, are listed in Table 3. These class descriptions also apply to the classes used in the model predictions. The data in the tables show that there actually has been change in vegetation composition throughout the marsh from freshwater-intermediate-brackish-subsaline to predominately freshwater (sites 1, 4-9) with an area of intermediate-freshwater mix (site 10), intermediate (site 3), and brackish (site 2) marsh. These changes were already evident in 1993-1994, when the sampled areas had changed from subsaline, brackish, freshwater/intermediate, and freshwater, to brackish/subsaline, intermediate, freshwater, and freshwater, as these classes are described in Pearlstine et al. (1990) and Table 3.

Because the belt transect sampling technique used to sample the vegetation in 1997 is likely to encounter a greater number of species than the small, circular plots used in 1986-88 and 1993-94, comparisons based on species number and importance values should be used cautiously. The more species you encounter, the smaller each proportion must be, and the distribution approaches the lognormal (Whittaker 1965). Species dominance-diversity curves were discussed by Whittaker (1965) as a way to assess patterns of niche differentiation in a community, and are intended to represent a *range* of intergrading types. The varied forms of the curves represent relationships (such

as competition) of species in communities, and they are not necessarily exclusive. That is, they may overlap along environmental gradients, and gradual change of population densities along the gradients means the community compositions change gradually and continuously along the gradient. The result eventually is dissociations of species to escape the direct competition. With this in mind, and the fact that labeling the curves as one type or another can be subjective, the 4 resampled (in 1986-88 and 1997) quadrat curves could be labeled as follows:

Quadrat Number	Curve Type in 1986-1988	Curve Type in 1997
8	Freshwater	Freshwater
4	Intermediate	Freshwater
3	Brackish	Freshwater
4	Subsaline	Subsaline

and the other quadrats from 1997 could be labeled as:

Quadrat Number	Curve Type in 1997
1	Freshwater
5	Intermediate
6	Freshwater
7	Brackish / Intermediate
9	Freshwater
10	Intermediate

Although this does not indicate as extensive a shift in marsh types as comparing the species proportions in pie charts, it does show change has occurred to a greater extent than suggested in the DEIS Figure 40. This agrees with changes apparent on the satellite imagery classification that were not recognized in the DEIS and follows the trends suggested from the class composition comparisons in Tables 1 and 2.

Additional evidence of marsh change is presented in the discussion of Species Comparisons between Different Quadrat Areas (4.10.3.4). Similarity coefficients were calculated among quadrat pairs to determine if there were general species associations across the sampled system. If the quadrats are grouped as indicated in Figure 39 (group 1=Q2; group 2=Q10, 5, 3, 4, 7; group 3=Q1; group 4=Q6,8,9) the species compositions follow the groupings for vegetation classes in Pearlstine et al. (1990) and Table 3. Thus group 1 represents a brackish community, group 2 represents a freshwater / intermediate mix community, and groups 3 and 4 represent freshwater communities. Again this represents a change from 1986-88, when these groups would have been subsaline (group 1), brackish (group 2), intermediate (group 3), and freshwater (group 4), respectively, based on the types assigned to the 1986-88 sample sites. These conclusions are further corroborated by comparisons of the classified satellite imagery from both intervals.

Comparison of satellite imagery classifications also indicate the marsh has changed and continues to be in transition to a freshwater system, contrary to conclusions drawn in the DEIS. Marshes in the 1987 image classification followed a trend from subsaline to freshwater, with species proportions changing as indicated in Table 3. The succession model developed by Pearlstine et al. (1990) predicted 1987 marsh class distributions in fairly good agreement with the classified map (75%) in 1987.

In the misclassified area of the marsh (east of Argyle Island below highway 17), the system salinities represented a subsaline type, so the model classified it as such, while the standing vegetation was delineated as brackish in the image classification. The marsh vegetation communities delineated in the 1997 classification are also in fairly good agreement with model predictions of marsh community distributions following tide gate decommissioning, if the same classification groups as detailed in Table 3 are used in the 1997 effort. The freshwater marsh type predicted in the "tide gate not operating" condition of the model extends southward across most of Argyle Island and transitions to intermediate marsh south of New Cut. In the 1997 classification, if the species are similarly grouped into comparable classes as identified in Tables 2 and 3, Argyle Island to Rifle Cut is primarily freshwater marsh, from Rifle Cut south to New Cut is freshwater-intermediate mix, and from New Cut south to Highway 17 Intermediate to brackish marsh. This is a substantial change from the "tide gate operating" vegetation classification and model prediction of 1987, when freshwater marsh existed only at the north end of Argyle Island, intermediate marsh occurred from Lucknow Canal to Rifle Cut, brackish marsh covered from Rifle Cut to New Cut, and subsaline marsh existed from New Cut to the tide gate. The error in interpretation indicates the transitional and intergrading compositions of communities undergoing successional change was ignored in an effort to assign single, dominant species labels to the types.

It is unclear from the documentation just how the classification comparison was done and just what would constitute "dramatic change" in the marsh. A one-to-one raster or grid-cell based comparison could have been made between the marsh classifications (with and without the tide gate) and the model predictions (with and without the tide gate) using maps coded with the same classification schemes (such as that outlined in Table 3; this is possible since both time periods included common marsh types in the classifications). A difference or disagreement map indicating change in type could have been produced which would illustrate the changes discussed above that are recognizable in a visual comparison of the maps and model output. The method should be documented, as well as a more-detailed discussion of the classification procedures and a classification accuracy assessment. The later is particularly important, given the transitional nature of the marshes, which ATM recognized was complicating the classification effort.

Table 1 consisted of a comparison of site compositions for areas sampled during 1986-88, 1993-1994, and 1997, and predications of marsh types at these sites with changes expected after tide gate decommissioning, from Pearlstine et al. (1990). Note confirmation of marsh type conversion from more saline to intermediate/brackish to freshwater at sites 2, 3, 4, and 8.

Table 2 contained data on the 15 dominant species and percent of total sample recorded at each sample site and sample period. Percentages were not given in the documentation of sampling conducted in 1986-1988 and 1993-1994; these values are estimated from pie charts in the sample reports. Species that were recorded in more than one sample period are listed on the same table line to facilitate comparison. *Eleocharis montevidensis* and *Eleocharis fallax* are listed on the same line. Although six sites were sampled only in 1997, they are listed so that comparisons can be made with class descriptions listed in Table 3.

Table 3 contained data on species composition of freshwater, intermediate, brackish, and subsaline sites (from Pearlstine et al. 1990) for clarification of the Pearlstine et al. (1990) model classification.. These proportions were used as descriptions of the classes in delineating vegetation model predictions, and the summary presented in Table 1 in this document. Note the complex assemblages and overlap of species between these types which were delineated statistically in Pearlstine et al. (1990), in contrast to the simplistic interpretation of the model output in the DEIS.

RESPONSE: Please see Attachment A, Response to the Evaluation of the Ecological Report.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
P.O. Box 12559
217 Fort Johnson Road
Charleston, South Carolina 29422-2559

June 23, 1998

Colonel Grant M. Smith
District Engineer, Savannah District
U.S. Army Corps of Engineers
P.O. Box 889
Savannah, Georgia 31402-0889

Dear Colonel Smith:

As part of the evaluation of the Savannah Harbor Deepening project, the Fish and Wildlife Service (Service) has reviewed the Dredge Material Environmental Effects Evaluation (DMEEE) prepared by Applied Technology and Management. These comments are submitted as a planning aid letter in partial fulfillment of the statutory requirements under the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 1U.S.C. 661-667d). These comments do not constitute the final report of the Secretary of the Interior as required by Section 2(b) of the FWCA. Planning aid letters pursuant to the, Fish and Wildlife Coordination Act were provided on March 26 and June 22 from our Atlanta Region Office. Further comments pursuant to Section 102 of the National Environmental Policy Act will be issued from the Department of Interior's Regional Environmental Officer in mid July.

General Comments

The sediment sampling and analysis was performed to provide information for the evaluation of potential effects associated with the handling and management of the dredge material. Handling and management alternatives are in turn determined based on the location of the material to be dredged (i.e., inner harbor sediments are generally placed in upland confined disposal facilities and bar channel sediments in the ocean dredged material disposal site). The DMEEE takes this one step further by discussing throughout the entire document the handling and management alternatives by referencing specific reaches within the harbor. Sample IDs do not reflect these particular reaches and makes correlating specific samples with the corresponding reach difficult.

Therefore, in order to be consistent with the terminology used in the body of the DMEEE, chemical analysis data should be organized and presented in the DMEEE based on the reach in which the material exists prior to dredging and by the preferred management alternative (upland disposal or ocean disposal). A more thorough discussion of specific samples should also be incorporated into the body of the DMEEE instead of referencing the data tables found in the back of this document. Contaminant concentrations in each reach must also be considered when selecting handling and management alternatives.

In addition, it is unclear if all analyses proposed in the Sampling and Analysis Plan (SAP) were performed on each composite sample. The following tables present the composite samples and the analyses performed on these samples that are included in the DMEEE. Any error in this table may be due to the DMEEE's organization and presentation of the data. The missing data from these composite samples should be presented in the DMEEE and an explanation, discussion and list of analyses performed on each composite should be provided.

Sample ID	Elutriate Total	Elutriate Dissolved	Bulk Sed. Metal	TBT	Bulk Sed. PAH
SHBCC01NW	NP	presented	NP	presented	NP
SHBCC01OM	NP	presented	presented	presented	presented
SHBCC02NW	NP	NP	NP	presented	NP
SHBCC020M	NP	NP	NP	NP	NP
SHBCC03NW	NP	presented	NP	presented	NP
SHIHC01NW	NP	NP	NP	NP	NP
SHIHC01OM	Presented	NP	presented	presented	presented
SHIHC02NW	Presented	presented	NP	presented	NP
SHIHC02OM	Presented	presented	presented	presented	presented
SHIHC03NW	NP	NP	NP	presented	NP
SHIHC03OM	NP	NP	presented	presented	presented
SHIHC04NW	Presented	NP	NP	presented	NP
SHIHC05NW	Presented	presented	NP	presented	NP
SHIHC06NW	NP	NP	NP	NP	NP
SHIHC07NW	NP	NP	presented	presented	presented

Sample ID	TBP Necula	TBP Lumbrineridea	TBP Polychaete	TBP Mollusca
SHBCC01NW	NP	presented	presented	presented
SCBCC01OM	presented	presented	presented	presented
SHBCC02NW	NP	presented	presented	presented
SHBCC02OM	NP	NP	NP	NP
SHBCC03NW	NP	presented	presented	presented
SHIHC01NW	NP	presented	presented	presented
SHIHC01OM	presented	presented	presented	presented
SHIHC02NW	NP	presented	presented	presented
SHIHC02OM	presented	presented	presented	presented
SHIHC03NW	NP	presented	presented	presented
SHIHC03OM	presented	presented	presented	presented
SHIHC04NW	NP	presented	presented	presented
SHIHC05NW	NP	presented	presented	presented
SHIHC06NW	NP	NP	NP	NP
SHIHC07NW	presented	presented	presented	presented

NP - results not presented in the DMEEE
Presented - results presented in the DMEEE

Interpretation of the sediment analyses throughout the DMEEE is done by comparing sediment quality assurance guidelines (SQAGs) to normalized concentrations instead of detected concentrations. The SQAGs were derived from a large database including in situ and laboratory investigations and therefore incorporate many of the values used for normalizing data in the DMEEE- It is therefore inaccurate to Compare normalized data to the SQAGs.

When interpreting the results of the elutriate analyses, the most conservative state water quality criteria (WQC) should be used because water quality from both South Carolina and Georgia may be impacted. Evaluation of elutriate analyses show that WQC values for arsenic (As) are exceeded in the Lower Harbor, Nearshore, and Offshore reaches. Therefore, the placement of this material in the ODMDS or in CDFs may lead to an unacceptable risk to fish and wildlife and possibly violation of state WQC. Furthermore, WQC and elutriate analyses have been used to interpret potential effects during dredging. The elutriate analysis is designed to predict effluent water quality of the disposal areas after placement of the dredge material within the disposal area. Interpretation of ecotoxicological effects during dredging activities should also incorporate ER-L and ER-M screening values for sediment.

The 'reference' stations selected are inappropriate. One is in the Savannah River, on the opposite side of Bird Island from the proposed project site. Sediments in this area are not likely to be cleaner than sediments in the project area. Other 'reference' sites are impacted by ongoing dredging activities, as they are near or directly associated with the dredge spoils disposal site on the Wright River. In order to assess the potential for the project sediments to impact biota in the proposed project area, these sediments must be compared to un-impacted sediments. When compared to sediments upstream of the project area (Winger and Lasier, 1994), sediments in the Savannah River harbor area were shown to have elevated metals concentrations.

Specific Comments

Page V. An accident involving a ship of Neptune Orient Lines resulted in the release of several constituents into the marine environment at the RACON/Light area. The DMEEE states that if Neptune Orient lines does not take appropriate actions to remove the contaminated sediments from this area then additional sampling will be conducted to develop a low-cost management alternative. The sampling that has already been completed at the site characterizes the sediments in this area and has shown the need for special handling and disposal of this material. Therefore, if there is to be any excavation of the sediments from this area appropriate measures should be taken during dredging and disposal of the material. In addition, post-disposal management alternatives for the material should be presented in the DMEEE.

Page 6. The DMEEE fails to adequately address terrestrial wildlife species as potential receptors to contaminants present in the dredge material. The failure to assess terrestrial wildlife effects is likely the result of the determination presented in the DMEEE that CDFs provide poor foraging habitat for birds and mammals and therefore does not provide an adequate route for wildlife exposure. This determination is grossly inaccurate and unsupported. Current estimate show that the CDFs currently provide a total of 5,494 acres of bird habitat and wildlife utilization of the disposal facilities has been widely documented (U. S Army Corps of Engineers 1996, Winger and Lasier 1997, Scott et al 1997). Many species of migratory birds have been recorded within the CDFs and bird counts exceed 20,000 to 30,000 individuals during peak migration. At least 33 species of shorebirds have been recorded in the CDFs with several species being recorded there in larger numbers than anywhere else in South Carolina. Twenty-three species of waterfowl are known to utilize the CDFs with approximately 1,000 to 4,000 ducks commonly wintering within the disposal areas. Most species of herons, egrets, and ibis occur in the CDFs throughout the year and the endangered wood stork utilizes the CDFs usually from August to October. Fifteen species of gulls and terns have been recorded in the disposal areas and utilize flat, open areas within the CDFs as resting areas throughout the year. Recent records indicate a high count of 665 gulls and terns of various species in the CDFs in December 1995.

Birds have also been recorded to use the CDFs for breeding and foraging. The mottled duck, willet, nighthawk, killdeer, and common moorhen have been reported as frequent breeders within the CDFs. In addition, a few species of special concern such as the least tern, black-necked stilt, and Wilson's plover that are known to be in decline throughout much of their breeding range nest within the CDFs. Raptors are attracted to the CDFs due to high concentrations of prey species and are frequently seen hunting over the impoundments and marshes. Two active bald eagle nests are located in the vicinity of the CDFs and eagles are sighted in the Savannah Harbor area, especially over the CDFs. Various gulls feed near the head section discharge pipe during deposit operations. (U.S. Army, Corps of Engineers 1996).

Historical data presented in the DMEEE show the contamination of sediments in the Savannah Harbor has been extensively documented. Constituents that have been detected within these sediments include various metal and organometalic compounds, Polycyclic Aromatic Hydrocarbons (PAHs), and Polychlorinated dibenzo-p-dioxins and furans (PCDD/PCDFs). The bulk sediment and elutriate analysis performed for this proposed project also show a variety of contaminants present in the material proposed for dredging. Many of these contaminants have also been detected at levels associated with deleterious ecological impacts.

Tab 5. Concentrations of metals and organometalic complexes were detected in at least one sample from each reach proposed for dredging. The majority of metal contamination seems to occur in the lower harbor reach sediments. Lower Harbor sediments have elevated concentrations of cadmium (Cd), arsenic (As), and tributyl tin (TBT) that exceed selected SQAGs. Most notable are the concentrations of tributyl tin (maximum value of 445 ug/kg) that are two orders of magnitude greater than values known to be protective of aquatic life (5 ug/kg). Elevated levels of TBT were also detected in the Nearshore and Jones Oysterbed reaches with maximum detected concentrations of 392 ug/kg and 213 ug/kg respectively. Nearshore reach samples also had values for As and Cd that exceed ER-Ls for these two elements. Cd concentrations exceeding the ER-L of 1.2 mg/kg were also detected in Upper Harbor, and Offshore reaches. Maximum Cd concentrations in Upper Harbor and Offshore reaches are 8.5 mg/kg and 24.3 mg respectively. Upper harbor and Offshore samples also had concentrations of As that exceeded the ER-L of 8.2 mg/kg and Upper Harbor sediments contained concentrations of Chromium (Cr), and Nickel (Ni) that exceed ER-L values.

Page 28. It is not clear whether the concentrations used to assess the toxic potential of the sediments were normalized to aluminum. The text states that it would not be appropriate to normalize the data from this area, however, the tables show data that are normalized. This difference needs to be clarified, and a more thorough explanation of why data were normalized should be presented.

Tab 6. PAHs are ubiquitous in the Savannah Harbor and were detected in all samples. The data suggest that anthropogenic contribution is responsible for the concentrations of PAHs present in harbor sediments. Two samples, one in the Nearshore reach and the other in the Lower Harbor reach, had concentrations that exceed ER-L values.

Tab 7. PCDD/PCDF were detected in samples collected from the Upper Harbor, Lower Harbor, and Nearshore reaches above SQAGS. These concentrations were detected in O&M samples for all three reaches and in NW channel and widener composite samples in the Lower Harbor. Concentrations above the 2.5 parts per trillion (pptr) SQAGs for protection of mammalian wildlife were detected in six of the samples with a maximum value of 5.9 pptr. The highly toxic nature of these compounds and their potency at such small concentrations has resulted in the development of a "rule of thumb" to place an impervious cap over any material containing concentrations above 2.5 pptr in order to provide adequate protection, for terrestrial wildlife species.

Page 40. The author's use of 10 percent of the method detection limit (MDL) for estimating concentrations of contaminants below the detection limit, rather than the EPA method of using 50 percent of the MDL, is inappropriate. The document supports this method by referencing a correspondence, which states "...most analysts are quite confident that the concentration data that is found between the MDL and 0.1 MDL is indicative of the presence of the compound in question, but may be a little less certain of the actual concentration.' The document also references Savannah River Laboratories (SRL), which is reportedly "comfortable will the use of the 10% of the [practical quantification limit (PQL)] method ... " to support their argument. The PQL is generally higher than the MDL, therefore, the SRL value is more conservative than the suggested value from the above referenced correspondence. However, the SRL value is still less conservative than the value suggested by EPA. Therefore, in order to impact more certainty that the proposed project will not be responsible for any trust resource damages, the more conservative EPA value should be used for the interpretation of the data.

Page 62. In the summary the DMEEE cites the document Scott et al. 1994 to demonstrate that levels of contaminants detected in the sediments proposed for dredging should not cause unacceptable impacts to the aquatic environment. However, the presentation of this document in the Tier I evaluation section is not thorough enough to support such a conclusion. We believe that a more thorough analysis should be conducted and presented if this conclusion is to be sustained.

The extensive use of the CDFs by wildlife and the variety of contaminants detected above SQAGs throughout the project area provide adequate evidence that the deepening project may lead to deleterious ecological impacts. Placement of dredged material in CDFs may provide a route of exposure for wildlife that utilize these impoundments for resting, breeding and foraging. A recent study by Winger and Lasier, 1997 showed that certain metals were bioavailable and bioaccumulated in livers of birds and raccoons to concentrations higher than those in dredge-spoil material. Liver metal concentrations were significantly higher in raccoons collected near the disposal than those in liver from raccoons collected from an upland control site. Accumulation of chlorinated organic contaminants has also been documented in eggs of black-necked stilts nesting within the disposal areas (USFWS, unpublished report). Therefore, contaminants in dredged material may be mobile and biologically available to wildlife frequenting these areas.

In addition, the presence of elevated contaminant concentrations in elutriate samples suggest that drainage from disposal areas may impact habitat quality in the wetland areas that receive discharges from dredging activities. Placement of the material in the ODMDS may lead to even further water quality affects that may be detrimental to aquatic organisms. Disturbance of the sediments during dredging activities may liberate sediment-bound contaminants into the water column where they would be more biologically available to aquatic species. Accumulation of these contaminants in the aquatic ecosystem may result in further exposure to wildlife that feed within this system.

We recommend that a revised DMEEE be prepared to address these concerns before the Savannah Harbor project is finalized and sent to Congress for approval. We also recommend that all environmental documents be revised to reflect corrections in the DMEEE. We appreciate the opportunity to provide these comments.

Sincerely yours,

Edwin M. EuDaly
Acting Field Supervisor

EME/km

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Letter response

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June 23, 1998

General Comments

1. COMMENT: It is unclear if all analyses proposed in the Sampling and Analysis Plan (SAP) were performed on each composite sample. The missing data from these composite samples should be presented in the DMEEE and an explanation, discussion and list of analyses performed on each composite should be provided.

RESPONSE: A SAP was prepared, representative water and sediment samples collected, and appropriate laboratory analyses were performed to provide the necessary physical and chemical data (Supplemental) for a Dredged Material Environmental Effects Evaluation (DMEEE). The primary purpose of the DMEEE was to support the development of two evaluations that are a part of the EIS: a Section 404 CWA evaluation and Section 103 MPRSA evaluation. The purpose of the DMEEE was to make the best use of the available information gathered during the Tier I and Tier II (see Inland Testing Manual or Green Book for tiered framework) investigations to make factual determinations concerning the potential of the discharge of dredged material from the proposed deepening project to unacceptably degrade the aquatic ecosystem. The DMEEE made use of the best available guidance and most up-to-date scientific materials commonly used by the USACE and the USEPA to make these types of determinations. The DMEEE makes use of all of this information and available tools to provide an evaluation of the proposed project material and the existing federal project O&M material. In addition to this evaluation, *all* of the physical and chemical data collected pursuant to these ends is presented in the three volumes of the DMEEE in raw form and in copious summarized forms.

The SAP details the analyses that were scheduled for reach composite samples. These composite samples represent three (3) categories of material for the five (5) project reaches established for subdivision of the dredging area in the SAP (see discussion in SAP beginning on Page 4). Most of the analytes included for material screening were performed on all of the representative project samples. The composites were only created so that a complete and economical characterization could be conducted. The composites permitted the inclusion of several expensive organic tests (i.e., PCB congeners, 2378-PCDD / PCDF congeners, and organotins) while maintaining the division of project sediments types (i.e., channel samples were composited separately from widener samples). Additionally, the reach composite

regime permitted the separate elutriation of five (5) representative project sediments and three (3) representative O&M samples.

The SAP divided the scheduled tests into three (3) suites, which are detailed in Tables 7, 8, and 9 of the that document. Page 19 of the SAP describes the tests that were to be performed on the reach composite samples. These included the Additional Parameters (PCDD / PCDF congeners, PCB congeners, organotins, and TOC; Table 8 of the SAP) and the Elutriate Analyte Suite (Table 9 of the SAP). Parameter classes such as metals, pesticides, and PAHs were performed on the individual samples that comprise the composites and were therefore not necessary or scheduled for the composites. The table provided in the USF&WS comment letter is repeated below with explanation. All of the composite sample analyses scheduled were performed except on the Upper Harbor NW channel samples composite (SHIHC01NW) because insufficient sample was not obtained to perform all of these tests. The geotechnical analysis and the chemical analyses performed on the samples obtained were more than adequate to confirm that the material in this strata is virgin and was laid down by natural processes long before anthropogenic activities began in the Harbor area. The full suite of analyses were performed on both of the more enriched sediment types from the Upper Harbor Reach: the bend widener material and the existing project O&M.

The three (3) material categories include two (2) types of project sediments (sediments directly associated with the proposed deepening that could potentially produce incremental impacts) and the existing O&M material that currently has environmental clearance and is continually being removed to the CDFs and the ODMDS to maintain the federal project. The project sediments consist of: ① the virgin material within the federal channel horizontal boundaries, but below the existing authorized depths [these samples are labeled with the existing project station (STA) numbers (e.g., SHIH085NW)] and ② the material proposed for excavation to create the necessary bend wideners, which consists of both surficial sediments and strata not included in the existing federal project, but which is characteristically different from the material from below the existing federal channel [these samples are labeled as sequential bend wideners beginning from the top of the Upper Harbor (e.g., SHIHW01NW, SHIHW02NW, etc.)]. Of the two types of project sediments, the bend widener material has a greater potential for enrichment.

Table 1. Summary of Composite Tests Scheduled and Performed for the Savannah Harbor Expansion Project SAP in Support of the EIS

Sample ID	Elutriate Tests		Bulk Sediment Chemistry		
	Total	Dissolved	Metals	Organotins	PAHs
SHBCC01NW	§103 Standard Elutriate Test (SET)-presented[1]		NS in SAP[5]	Presented	NS in SAP[5]
SHBCC01OM			Presented	Presented	Presented
SHBCC02NW	Not Scheduled (NS) in SAP[2]		NS in SAP[5]	Presented	NS in SAP[5]
SHBCC02OM			Presented[6]	Presented[6]	Presented[6]
SHBCC03NW	§103 SET-presented[1]		NS in SAP[5]	Presented	NS in SAP[5]
SHIHC01NW	NP[3]	NS in SAP[2]	NS in SAP[5]	NP[3]	NS in SAP[5]
SHIHC01OM	Presented	NS in SAP[2]	Presented	Presented	Presented
SHIHC02NW	Presented	Presented	NS in SAP[5]	Presented	NS in SAP[5]
SHIHC02OM	Presented	Presented	Presented	Presented	Presented
SHIHC03NW	Not Scheduled (NS) in SAP[2]		NS in SAP[5]	Presented	NS in SAP[5]
SHIHC03OM			Presented	Presented	Presented
SHIHC04NW	Presented	NS in SAP[2]	NS in SAP[5]	Presented	NS in SAP[5]
SHIHC05NW	Presented	Presented	NS in SAP[5]	Presented	NS in SAP[5]
SHIHC06NW	Not Scheduled (NS) in SAP[2]		NS in SAP[5]	Presented[7]	NS in SAP[5]
SHIHC07NW	Not Scheduled (NS) in SAP[4]		Presented	Presented	Presented

NS=Not Scheduled to be performed in the SAP.

[1]Representative sediments from the Bar Channel were elutriated according to §103 MPRSA procedures using the USACE Standard Elutriate Test. This test reports only dissolved concentrations (see p. 19 of SAP).

[2]The SAP required elutriate analyses for only three of the five (5) Harbor reaches (Upper Harbor, Lower Harbor, and Nearshore). SHBCC02OM, SHBCC02NW, SHIHC03NW, SHIHC03OM, SHIHC03NW, and SHIHC06NW are composites from the Offshore and Jones Oysterbed Reaches, where elutriates were not required in the SAP. Table 6 in the SAP (p. 19) details the composite samples, the Reaches from which they were derived, and the samples from which they were composed.

[3]The representative NW material from the Upper Harbor channel samples was not elutriated or analyzed for organotins, PCB congeners, or 2378-PCDD/PCDF congeners because sufficient volume could not be obtained to conduct all of the tests. The inability of the vibratory coring equipment to make adequate penetration, the results of the bulk chemistry, and the elutriate results from the similar virgin sediments in the Lower Harbor are adequate to confirm that this natural strata does not contain the "parameter of concern requiring the greatest dilution to meet WQS." This constituent was Cu, which was elutriated from the representative bend widener sediments. The bend wideners were expected to be the most enriched sediments associated with the deepening.

[4]The seventh Inner Harbor NW material composite (SHIHC07NW) was not scheduled in the SAP. This composite was developed after the sampling effort to make the best use of the available material obtained from the coring of the virgin channel sediments. Page 20 of the DMEEE explains: "For

several stations in the Lower Harbor Reach (STA 065+000, STA 055+000, STA 035+000 and STA 025+000), NW sample was obtained, but not at sufficient quantities to perform all the various physical, chemical, and elutriate tests and make the required archives, so a NW composite was created from these samples (SHIHC07NW). The summary tables will include this sample for all parameter groups intended for the individual NW channel samples."

[5]The SAP (Page 4) states: "In order to economically analyze the sediments from the entire project proposal for the wide range of parameters necessary to make a complete analysis, several of the more costly tests (e.g., PCDD/PCDFs) will be analyzed on composited samples." The metals and other parameters in the Basic Analyte Suite including the PAHs, phenols, and pesticides were performed on all NW samples individually. These individual samples were composited to represent reaches for more the costly organics tests, organotins, and elutriates. To obtain a representative value for a reach for any of the parameters in the Basic Analyte Suite (see Table 7 in the SAP), compute a geometric mean of the detected concentrations from the individual samples making up the appropriate reach composite. For example, to obtain a representative value for the Upper Harbor bend wideners, compute a geometric mean of the results from SHIHW01NW and SHIHW02NW.

[6]SHBCC02OM is presented as SHBC035OM because STA (-)035+000 in the Bar Channel is the only Offshore Reach sample that contains O&M material. STA (-)075+000 is beyond the present project limits and is therefore all NW.

[7]SHIHC06NW is presented as SHIHW10NW because the C06 composite represents the widener material for the Jones Oysterbed Reach for which there was only one widener, W10.

Table 2. Summary of the Theoretical Bioaccumulation Potential Calculations Performed and Presented in the DMEEE

Sample ID	TBP_{Necula}	$TBP_{Lumbrineridae}$	$TBP_{Polychaete}$	$TBP_{Mollusca}$
SHBCC01NW	NS in SAP[1]	Presented	Presented	Presented
SCBCC01OM	Presented	Presented	Presented	Presented
SHBCC02NW	NS in SAP[1]	Presented	Presented	Presented
SHBCC02OM	Presented[2]	Presented[2]	Presented[2]	Presented[2]
SHBCC03NW	NS in SAP[1]	Presented	Presented	Presented
SHIHC01NW	NS in SAP[1]	Presented	Presented	Presented
SHIHC01OM	Presented	Presented	Presented	Presented
SHIHC02NW	NS in SAP[1]	Presented	Presented	Presented
SHIHC02OM	Presented	Presented	Presented	Presented
SHIHC03NW	NS in SAP[1]	Presented	Presented	Presented
SHIHC03OM	Presented	Presented	Presented	Presented
SHIHC04NW	NS in SAP[1]	Presented	Presented	Presented
SHIHC05NW	NS in SAP[1]	Presented	Presented	Presented
SHIHC06NW	NS in SAP[1]	Presented[3]	Presented[3]	Presented[3]
SHIHC07NW	Presented	Presented	Presented	Presented

NS=Not Scheduled to be performed in the SAP.

[1]The USACE BSAF Database contains BSAFs for several PAH compounds and organisms, but the most complete set available was used in the DMEEE analysis (*Nucula spp.*). Because PAHs were analyzed for individual channel and bend widener samples, the TBPs were calculated were calculated

for each of these. TBPs were calculated for those analyte classes that were only performed on reach composite samples (i.e., PCDD / PCDF congeners). The existing project O&M material was only analyzed in composite, so PAH TBPs for *Nucula* were calculated from these results.

[2]SHBCC02OM is presented as SHBC035OM because STA (-)035+000 in the Bar Channel is the only Offshore Reach sample that contains O&M material. STA (-)075+000 is beyond the present project limits and is therefore all NW.

[3]SHIHC06NW is presented as SHIHW10NW because the C06 composite represents the widener material for the Jones Oysterbed Reach for which there was only one widener, W10.

ACTION: No action required. No changes will be made to the DMEEE or the EIS.

2. COMMENT: Interpretation of the sediment analyses throughout the DMEEE is done by comparing sediment quality assurance guidelines (SQAGs) to normalized concentrations instead of detected concentrations. It is inaccurate to compare normalized data to the SQAGs.

RESPONSE: The environmental laboratory reported the supplemental bulk sediment chemistry results on a dry-weight normalized basis (see DMEEE Laboratory Appendix for Laboratory Data Sheets) as specified by the SAP (Page 25). This is also required by the Savannah US Army Engineer District dredged material testing Scope of Work for Savannah Harbor: "All concentrations are to be reported on a dry weight basis." Sediment concentrations are typically normalized to dry weight to provide consistency in reporting. All of the data input to the databases used to generate the SQAGs used for the DMEEE were normalized to dry weight. [In many cases, data that had been reported normalized organic carbon was converted to 1% OC for consistency with other data used to generate the SQAGs, which had an average TOC of 1.2 ± 1.8% (MacDonald, 1994).] Additionally, proper use of the SQAGs for metals requires that total digestion techniques be used to break down the structure of the clays.

The DMEEE correctly applied the SQAGs to dry-weight normalized values according to the procedures set forth in Long and Morgan (1990), Long et al. (1995), MacDonald (1994), and MacDonald et al. (1995) and utilized total digestion procedures for the metals chemistry. Application of SQAGs to "detected concentrations" or wet weight values may under predict the potential toxicity of the sediments under study. For example, the sediments from the Savannah Harbor often have low total solids values (e.g., SHIH103NW was only 42% solids). In the case of this material from near the Kings Island Turning Basin, the detected concentration of 16.6 ppm for Chromium should not be compared to the SQAGs (ERL=81 ppm, TEL=52.3 ppm, ERM=370 ppm, PEL=160), but the dry-weight normalized value reported on the laboratory data sheets, 39.6 ppm, which is calculated by the following equation:

$$C_{dry} = \frac{C_{wet}}{\%solids}$$

where the dry-weight normalized value (C_{dry}) is calculated from the detected (wet-weight) concentration (C_{wet}) divided by the solid portion of the sample (%solids). In

the case of the SHIH103NW example, the detected concentration of 16.6 ppm must be divided by the solid portion of the sample (42%) to produce the normalized reported value 39.6 ppm Cr.

ACTION: No action required. The DMEEE correctly compared dry-weight normalized sediment concentrations to available SQAGs.

3. COMMENT: When interpreting the results of the elutriate analyses, the most conservative state water quality criteria (WQC) should be used because water quality from both South Carolina and Georgia may be impacted.

RESPONSE: The DMEEE applied appropriate procedures set forth in the Inland Testing Manual (ITM) and the Green Books for supplemental dredged material water column effects analyses for disposal in inland and ocean waters. The Inland Testing Manual provides the procedures appropriate for implementation of the 404 Guidelines and the Green book for compliance with Section 103 of MPRSA. For the proposed deepening project, all of the dredged material placement options, except placement in the Savannah ODMDS, are regulated under Section 404 of the Clean Water Act. Under the guidance provided by the ITM, the dredged material discharge should be compared to appropriate State water quality standards (WQS) for the water body classification at the point of discharge. According to the ITM, "[t]he discharge of dredged material cannot cause the *WQS* to be exceeded outside the mixing zone unless the State provides a variance to the standard" (italics added).

For dredged material placed in the ODMDS (Ocean Dredged Material Disposal Site), the guidelines for evaluations are provided in the Green Book. In this case, the dredged material must be shown to meet the limiting possible concentration (LPC). The Green Book states that "[t]he LPC for the portion of dredged material that will remain in the water column is the concentration of any dissolved dredged-material constituent that, after making allowance for initial mixing, will not exceed applicable marine water quality criteria." The "applicable criteria" are published in the Regional Implementation Manual for Region IV USEPA and South Atlantic District USACE ocean disposal evaluations.

Water quality criteria (WQC) are only intended for use for Section 103 evaluations of dredged material proposed for ocean placement. Such criteria are used to determine LPC compliance in these evaluations. WQC are not regulatory; WQS developed by the State 401 Certification agency and enacted into legislation are to be used for compliance determinations in inland (CWA) waters. The WQS to be used are not to be "the most conservative" criteria available, but the State standards that are *appropriate* (i.e., those applicable at the point of discharge). For ocean disposal analysis, the "portion of dredged material that will remain in the water column" was determined by the USACE standard elutriate procedure and the applicable numerical mixing model (i.e., STFATE). The constituent of concern requiring the greatest dilution to meet *WQC* was determined by procedures set forth in the Green Book and modeled for the Savannah ODMDS.

For nearshore placement, the standard elutriate test results were used to determine the constituent of concern requiring the greatest dilution to meet Georgia *WQS* was used in an appropriate model (in this case, DCORMIX). The mixing determination should be performed for the waters at the point of discharge and the appropriate WQS for those waters. The nearshore placement alternatives are all proposed for Georgia nearshore waters.

The placement of dredged material from the Inner Harbor is proposed for placement in the Harbor CDF system; Upper Harbor sediments will be placed in CDFs that discharge to Georgia waters and Lower Harbor sediments will be placed in CDFs that primarily discharge to South Carolina. When the SAP was developed, the procedures set forth in the Savannah Harbor SOW and the Draft ITM were used. In SC, this required an evaluation of the "total" concentration of the dredged material constituent that was discharged to SC waters from the CDF return water system. Determining "total" concentrations requires following the USACE Modified Elutriate Test procedures. In the Lower Harbor, "total" concentrations of dredged material in the CDF return water were conservatively predicted using these procedures and compared with SC State WQS using an appropriate mixing model (i.e., volume dilution method). While it most appropriate to use SC WQS for the protection of Aquatic Life, which are based on WQC developed by the USEPA and are similar to the WQS enacted for Georgia, the more conservative SC drinking water standards were used for this analysis because of SCDHEC's interpretation that the human health standards are applicable for the protection of human health through the ingestion of fish tissues. Because these values are intended for drinking water, they are often too severe for dredged material investigations for two reasons: ① customary and acceptable laboratory methods can not make practical quantitative valuations of constituent concentrations in saline surface waters and ② background levels of many naturally-occurring constituents (e.g., arsenic and copper) are above the standards.

Since the time of the preparation of the project SAP, the final ITM was published and the Modified Elutriate Test replaced with the Effluent Elutriate Test for CDFs that should be used to compare the "dissolved" or bioavailable concentrations of dredged material constituents remaining in the water column to appropriate WQS. SC, however, at this time, requires that the "total" concentrations still be used. The methods and procedures used to conduct the water column effects evaluation in the DMEEE are therefore still appropriate and conservative.

ACTION: No action required. The DMEEE correctly and conservatively evaluated the potential effects of the dredged material on Georgia, SC, and federal waters using appropriate test procedures, models, and WQS/WQC. The evaluation was conducted as proposed in the project SAP and in accordance with the guidance provided by the ITM and Green Book. Where applicable, regional implementation procedures were also considered (Regional Implementation Manual for ocean waters and Savannah Harbor SOW for inland waters).

4. COMMENT: Evaluation of elutriate analyses show that WQC values for arsenic (As) are exceeded in the Lower Harbor, Nearshore, and Offshore reaches. Therefore, the placement of this material in the ODMDS or in CDFs may lead to an unacceptable risk to fish and wildlife and possibly violation of state WQC.

RESPONSE: After sample elutriation of the Lower Harbor representative sediments, arsenic was identified as the dredged material constituent of concern requiring the greatest dilution to meet WQS. The highest "total" effluent arsenic concentration calculated for the Lower Harbor was 6.3 µg/L, which is well below the marine chronic WQC of 35 ug/L (dissolved). Arsenic elutriating from dredged material placed in the Lower Harbor CDFs should not therefore "lead to an unacceptable risk to fish and wildlife" even before mixing. It should be noted that typical background values in ocean water (2.3 µg/L) exceed the SC freshwater drinking water standard of 1.4 µg/L.] Arsenic was modeled for the Lower Harbor using "total" predicted concentrations, the volume dilution method, and the SC drinking water WQS. The EIS indicates that As will meet State drinking water QQS within a 36 ft mixing zone.

For the Nearshore Reach, arsenic was not the constituent of concern requiring the greatest dilution to meet WQS. Ammonia and Nickel were modeled using D-CORMIX and the concentrations of these constituents met Georgia WQS within a 30 ft mixing zone. By method, As concentrations meet Georgia WQS within this zone as well.

For the Offshore Reach, all of which was modeled for ODMDS placement, the constituent of concern requiring the greatest dilution was determined by whole sediment conversion of the bulk sediment chemistry. This constituent, Zinc, met the LPC within the boundaries of the ODMDS and within the 4-hr mixing time. By method, arsenic, will also meet chronic marine WQC within the ODMDS boundaries and within the mixing time.

ACTION: No action required. Where arsenic was the constituent of concern requiring the greatest dilution to meet WQS, the dissolved concentrations were well below chronic marine WQC for the protection of aquatic life, and met SC drinking water WQS within a small mixing zone.

5. COMMENT: WQC and elutriate analyses have been used to interpret potential effects during dredging. The elutriate analysis is designed to predict effluent water quality of the disposal areas after placement of the dredge material within the disposal area. Interpretation of ecotoxicological effects during dredging activities should also incorporate ER-L and ER-M screening values for sediment.

RESPONSE: The Inland Testing Manual states that "[m]aterial resuspended during normal dredging operations is considered 'de minimus' and is not regulated under Section 404 as a dredged material discharge." In situations where the dredged material contains contaminants at such high levels that resuspension may result in unacceptable adverse impacts, the potential impact of resuspension due to dredging can be addressed under NEPA. The evaluation of the sediments proposed for excavation from the Savannah Harbor for deepening are predominantly virgin sediments with high metal concentrations that were determined to be non-toxic using the currently available methods (especially SQAGs; ERL/TEL and ERM/PEL values).

Numerous studies conducted on the relatively more contaminated the Savannah Harbor berths have shown that resuspended sediments at high suspended solids concentrations (i.e., sediments resuspended by agitation) did not produce measurable toxic effects.

ACTION: No action required. Toxic effects from resuspension of sediments by hydraulic dredging are not expected to produce unacceptable adverse effects. Sediment elutriate (USACE Standard Elutriate Test) results would be required to model resuspension effects in situations where dredged material is heavily contaminated. Benthic SQAGs may serve as suitable screening criteria for determining contaminants of concern for which elutriate analyses should be performed, but are of no utility toward predicting the dissolved contaminants that will be available to aquatic life in a resuspension plume.

6. COMMENT: The 'reference' stations selected are inappropriate. One is in the Savannah River, on the opposite side of Bird Island from the proposed project site. Sediments in this area are not likely to be cleaner than sediments in the project area. Other 'reference' sites are impacted by ongoing dredging activities, as they are near or directly associated with the dredged material disposal site on the Wright River. In order to assess the potential for the project sediments to impact biota in the proposed project area, these sediments must be compared to un-impacted sediments.

RESPONSE: When placing dredged material in a CDF, current guidance documents do not provide an appropriate reference site. For metals analysis, the copious studies and analysis performed by Drs. Windom and Schropp as well as Hanson and Evans (see DMEEE) provide more than an adequate basis for screening depositional estuarine sediments for anthropogenic enrichment (see MacDonald, 1994) using aluminum as a reference element. In these cases, reference site testing is unnecessary. However, for metals analysis in sediment strata that are not composed primarily of aluminosilicate clays that dominate the maintenance material. Therefore, the reference core taken of virgin material in the South Channel provided a useful comparison for evaluating these Miocene deposits with naturally high metals concentrations.

Reference sediments are not supposed to be cleaner than the project sediments. If they were always cleaner, than there is no justification for expending resources on their analysis for dredged material evaluations. Reference sediments are supposed to be uninfluenced as much as possible from previous dredging operations. All other influences (e.g., industrial effluent discharges) are reasonable influences on estuarine sediments. The purpose for evaluating the proposed dredged material discharge against an adjacent reference sediment that is uninfluenced by previous dredging operations is for evaluation of the incremental impact of the activity on the existing resource. The New River reference site is the “Savannah Harbor Reference Site.” It was chosen by NMFS during a 1993 study that evaluated the impact of the Lower Harbor CDF underdrains on the Wright River.

A large and growing database of information is available for this site and all dredged material evaluations in the Savannah Harbor currently sample this site and evaluate against it. It provides a suitable open water surficial sediment reference that is connected to and influenced by Harbor activity, but is well away from direct dredged material disposal impacts.

ACTION: No action required. The DMEEE evaluated the project and O&M sediments against the reference sites specified in the SAP and in regional implementation documentation as well as additional sediments.

Specific Comments

7. COMMENT: Page V. An accident involving a ship of Neptune Orient Lines resulted in the release of several constituents into the marine environment at the RACON/Light area. The DMEEE states that if Neptune Orient lines does not take appropriate actions to remove the contaminated sediments from this area then additional sampling will be conducted to develop a low-cost management alternative. The sampling that has already been completed at the site characterizes the sediments in this area and has shown the need for special handling and disposal of this material. Therefore, if there is to be any excavation of the sediments from this area appropriate measures should be taken during dredging and disposal of the material. In addition, post-disposal management alternatives for the material should be presented in the DMEEE.

RESPONSE: Sediments from STA (-)075+000BC were technically exempt from sampling under the Section 103 guidelines. The site is 14 miles from typical sources of pollution, is subject to high energy wave activity, and is predominantly (>95%) sand-sized material. The single core taken at this location was performed to characterize the material beyond the existing project ocean channel and confirm the assumption that the material is free from unacceptably high concentrations of effects producing contaminants. When the laboratory results were evaluated and higher than expected concentrations of Cadmium and low-weight PAHs were reported, ATM investigated and discovered that the Neptune Jade allision with the tower was likely responsible for these contaminants.

Additionally, should any project alternative be selected other than the (-)50 ft MLW project [(-)52 ft MLW in the Bar Channel], sediments from this area may not require excavation as the project will not extend seaward this far. A single core in the area was considered insufficient to characterize the magnitude and extent of the remnant spill. No elutriate tests were run on the material and the core penetrated vertically beyond the sediments that are likely retaining the constituent material of concern. A series of surficial grab samples taken around the tower sight at logarithmically increasing intervals will provide the necessary data to make an appropriate ecotoxicological evaluation and define the extent of any contamination.

Because the USCGS has already supervised a clean-up of the site following the accident, it is likely that the contamination is localized and diluted. Because the sediments are not charged and sand-sized, it is also likely that natural forces have further diluted the constituent concentrations found at the site. Additionally, the PAHs found at the site were elevated, but not found at concentrations that will likely create adverse effects at the ODMDS.

The cadmium concentration was of some concern to evaluators, but will likely not be of such concentrations to create a potential hazard to aquatic life in and around the ODMDS once samples are taken and properly evaluated through using standard elutriation procedures and the STFATE model.

ACTION: If a project depth is selected that will require excavation of sediments in the area of the demolished Savannah RACON/Light, and the USCGS has not taken further clean-up action in the area, then additional testing of the surficial sediments in the vicinity will be performed to define the magnitude and extent of the contamination and to provide appropriate information to make an evaluation of the material for the proposed disposal alternative.

8. COMMENT: Page 6. The DMEEE fails to adequately address terrestrial wildlife species as potential receptors to contaminants present in the dredged sediments. The failure to assess terrestrial wildlife effects is likely the result of the determination presented in the DMEEE that CDFs provide poor foraging habitat for birds and mammals and therefore does not provide an adequate route for wildlife exposure. This determination is grossly inaccurate and unsupported. Birds have also been recorded to use the CDFs for breeding and foraging. The bulk sediment and elutriate analysis performed for this proposed project also show a variety of contaminants present in the material proposed for dredging. Many of these contaminants have also been detected at levels associated with deleterious ecological impacts.

RESPONSE: The DMEEE will be revised to appropriately consider terrestrial wildlife pathways from bioaccumulative contaminants of concern (BCCs). The analysis will make use of the most up-to-date USEPA and USACE supplemental procedures for terrestrial pathways analysis. BCCs will be selected from the larger project contaminants list detailed in the SAP that have octanol/water coefficients of greater than 10,000 (log $K_{ow} > 4$). These chemicals tend to bioaccumulate up the food chain and may pose a threat to foraging birds using the CDFs. BCCs will first be screened against the lower sediment quality assessment guidelines (ERL or TEL values). Theoretical bioaccumulation potentials (TBPs) will be calculated for the highest dw-normalized concentrations of BCCs exceeding threshold effects levels (MacDonald, 1994; Long et al., 1995) using an appropriate benthic organism for which biota-sediment accumulation factors (BSAFs) exist in the USACE database. TBPs will then be evaluated against FDA action levels for fish or shellfish (when available) according to procedures outlined in the ITM.

For those BCCs remaining after screening, the theoretical benthic tissue toxin will be evaluated against a no observable effects food concentration calculated for an appropriate measurement endpoint.

ACTION: Further evaluation of the dredged material will be conducted that more fully considers terrestrial biota-sediment pathways for avian life using the CDFs for foraging habitat.

9. COMMENT: Tab 5. Concentrations of metals and organometalic complexes were detected in at least one sample from each reach proposed for dredging. The majority of metal contamination seems to occur in the lower harbor reach sediments. Lower Harbor sediments have elevated concentrations of cadmium (Cd), arsenic (As), and tributyl tin (TBT) that exceed selected SQAGs. Most notable are the concentrations of tributyl tin (maximum value of 445 ug/kg) that are two orders of magnitude greater than values known to be protective of aquatic life (5 ug/kg). Elevated levels of TBT were also detected in the Nearshore and Jones Oysterbed reaches with maximum detected concentrations of 392 ug/kg and 213 ug/kg respectively. Nearshore reach samples also had values for As and Cd that exceed ER-Ls for these two elements. Cd concentrations exceeding the ER-L of 1.2 mg/kg were also detected in Upper Harbor, and Offshore reaches. Maximum Cd concentrations in Upper Harbor and Offshore reaches are 8.5 mg/kg and 24.3 mg respectively. Upper harbor and Offshore samples also had concentrations of As that exceeded the ER-L of 8.2 mg/kg and Upper Harbor sediments contained concentrations of Chromium (Cr), and Nickel (Ni) that exceed ER-L values.

RESPONSE: Harbor sediments were digested using strong acid techniques to provide total metal concentrations in the sediments (both adsorbed to the surfaces and structural metals) so that the aluminum normalization tools could be employed to test for anthropogenic enrichment and so that available SQAGs could be properly utilized for comparison in the evaluation. The elemental metals found in the Harbor sediments were primarily from natural sources and not harbor contamination. In most cases, the virgin material had higher concentration of cadmium, chromium, zinc, and manganese than the O&M overburden. The metals reported are total (structural and adsorbed to the particle surfaces) and do not represent bioavailable concentrations. Even if available, the recent work by Dr. Long and others (Long et al., 1998b) cited in the DMEEE indicated that in 77 samples analyzed (and chosen to reflect large metals gradients), the samples were toxic 0% of the time when all of the metal concentrations were below probable effects levels (ERM/PEL). It should be noted that of the 34 samples evaluated for metals, only one probable effects level (>ERM) exceedance was reported (Cd for the SHBC075NW sample near the demolished Savannah RACON/Light).

Arsenic is often found in SE estuarine sediments above threshold effects levels (ERL/TEL). Most often it is within the range expected for unenriched sediments. Historical studies in the Savannah and Charleston Harbors have documented arsenic levels in sediments and in the water column above criteria normally employed to screen this element. In most cases, the bulk of the total arsenic comes from natural sediment sources, not from anthropogenic enrichment.

As was cited in the DMEEE, "In all cases that the Arsenic concentration exceeded the ERL, the concentrations are in the natural range. MacDonald (1994, vol. 2, p. 48) recommends that 'further field studies are required to evaluate the applicability of SQAGs for arsenic, which are exceeded in a number of sites that are not anthropogenically-enriched.'"

TBT concentrations were found in representative bend widener sediments in the Lower Harbor, Jones Oysterbed, and Nearshore Reaches at concentrations higher than normally reported in SE estuaries or past sampling efforts in the Savannah Harbor. GPA and the Savannah USACE have been working with the USEPA since the TBT data was reported to determine the potential toxicity of this compound and its decomposition products on the aquatic environment. No official guidance is available for evaluating TBT concentrations in sediments and theoretical bioaccumulation potentials (TBPs) can not be calculated for organometallic complexes. On the basis of equilibrium partitioning and draft WQC, the TBT concentrations found could potentially effect aquatic organisms. The primary management alternative usually employed is to remove the material to an upland location away from the sensitive aquatic environment, but less is known about the effects of TBT on terrestrial species. Equilibrium partitioning may not even be an appropriate evaluation tool because it is unclear if TBT availability and toxicity is related to sediment organic carbon concentrations. The compounds appear to be tightly bound to the sediments because organotin compounds were not detected in the elutriated samples. The GPA, USACE, and USEPA are planning to perform additional testing on the sediments found to contain the highest TBT concentrations so that more definitive statements can be made concerning potential toxicity and for proper handling of the material.

It is important to note that only a small volume of the proposed project sediments contain elevated TBT concentrations. Most of the TBT exists in the existing project maintenance material that is only tangentially under consideration for this project. Additionally, the 5 µg/kg dw-normalized screening value cited by USF&WS that was used in the DMEEE and by NOAA NS&T Program is not a threshold effects value or a derived NOAEL of any sort. Because so little is known about the effects of TBT-sorbed sediments on aquatic life, NOAA began using this value to "flag" potentially harmful levels in the Lousianian Province in 1992. In that region only 7% of province estuaries had sediments exceeding this value. In contrast, 23% of estuaries in the Carolinian Province in 1994 had TBT concentrations reported above this value. MacDonald (1994) reported a 1987 study by Clark et al. that showed that extreme mortality in grass shrimp was observed at concentrations as low as 10,000 µg/Kg. While this is well over two orders of magnitude above values reported in the Savannah Harbor in the Lower Harbor and Nearshore O&M material, little is known about the potential toxicity or bioavailability of this compound.

ACTION: Further evaluation of the dredged material will be conducted to better define the toxic potential of the organotin compounds found in the Harbor O&M sediments both in the aquatic environment and through terrestrial pathways. This evaluation is not expected to be straight-forward. GPA is working closely with the Savannah USACE District and Region IV USEPA to develop a suitable testing plan. At this time, there is no information to indicate that the material is resulting in measurable adverse impacts to aquatic biota at the Savannah ODMDS, in the Savannah River Estuary, or in the Harbor CDFs.

10. COMMENT: Page 28. It is not clear whether the concentrations used to assess the toxic potential of the sediments were normalized to aluminum. The text states that it would not be appropriate to normalize the data from this area, however, the tables show data that are normalized. This difference needs to be clarified, and a more thorough explanation of why data were normalized should be presented.

RESPONSE: The results of the total metals chemistry using total digestion techniques were normalized to aluminum so that the data could be screened for anthropogenic enrichment prior to evaluating the dw-normalized results against available SQAGs as suggested in MacDonald (1994). The normalization data presented in the DMEEE indicates that the material from below the existing project depth is composed of Miocene clays that are too structurally different from the majority of surficial sediments found in SE estuaries that were used to develop the log-normalized aluminum to metal curves presented in Schropp and Windom's work. The DMEEE tables showed therefore, that it would be inappropriate to apply this tool to the virgin sediments. The tool is still appropriate for application to the existing project O&M material.

The benthic effects assessment utilized laboratory values normalized to dry weight, but not aluminum as directed in the various papers and reports by Drs. Long and MacDonald concerning proper application of SQAGs. The DMEEE provides an explanation of the proper use of both the aluminum normalization tool and SQAGs in the Supplemental Metals section.

ACTION: No action required. ATM will review the Metals section of the supplemental analysis in the DMEEE when it is revised and make appropriate clarifying statements where possible concerning the use of aluminum normalization and SQAGs.

11. COMMENT: Tab 6. PAHs are ubiquitous in the Savannah Harbor and were detected in all samples. The data suggest that anthropogenic contribution is responsible for the concentrations of PAHs present in harbor sediments. Two samples, one in the Nearshore reach and the other in the Lower Harbor reach, had concentrations that exceed ER-L values.

RESPONSE: Concur. These data were reported in the DMEEE. Concentrations of PAHs found in the project sediments and in the existing project O&M material that exceeded threshold effects levels (ERLs) were determined to not present an unacceptable hazard to aquatic benthic organisms or the water column during dredging. For those PAHs that exceed threshold effects levels, further evaluation of the potential effects of these compounds on terrestrial biota will be evaluated.

ACTION: ATM will assess the potential effect of PAH compounds (that exceed benthic threshold effects levels) on terrestrial biota using current procedures outlined in the response to Comment 8 above.

12. COMMENT: Tab 7. PCDD/PCDF were detected above SQAGS in samples collected from the Upper Harbor, Lower Harbor, and Nearshore reaches. These concentrations were detected in O&M samples for all three reaches and in NW channel and widener composite samples in the Lower Harbor. Concentrations above the 2.5 parts per trillion (pptr) SQAGs for protection of mammalian wildlife were detected in six of the samples with a maximum value of 5.9 pptr. The highly toxic nature of these compounds and their potency at such small concentrations has resulted in the development of a "rule of thumb" to place an impervious cap over any material containing concentrations above 2.5 pptr in order to provide adequate protection, for terrestrial wildlife species.

RESPONSE: The DMEEE evaluated the potential water column toxicity, benthic bioaccumulation, and toxic potential for avian species foraging the CDFs. The analysis did not suggest any potentially unacceptable adverse effects from the proposed disposal alternatives. It is inappropriate to apply screening values to 2378-TCDD TEQs calculated on sediment. TEQs should be calculated only in tissues. The calculation of sediment TEQs does not consider the extreme variability of the bioaccumulation potential of the various congeners. Should the USF&WS wish to calculate a useful and protective screening value, the dw-normalized sediment results for each congener should be multiplied by both an appropriate toxicity equivalence factor (TEF) and a bioaccumulation equivalency factor (BEF) that relates the relative toxicity and the relative bioaccumulation potential to 2378-TCDD. The resulting value, once normalized to organic carbon and presupposing that an appropriate set of TEFs and BEFs were used for the application can be compared to a screening value produced for a target measurement endpoints using available NOAEL information for 2378-TCDD.

ACTION: The DMEEE fully evaluated the potential PCDD/PCDF effects on the water column at the discharge site, the bioaccumulation potential on benthic organisms, and potential terrestrial pathway effects. No further evaluation is necessary. The 2.5 pptr 2378-TCDD sediment TEQ screening value is both inappropriate and misleading.

13. COMMENT: Page 40. The author's use of 10 percent of the method detection limit (MDL) for estimating concentrations of contaminants below the detection limit, rather than the EPA method of using 50 percent of the MDL, is inappropriate. In order to impact more certainty that the proposed project will not be responsible for any trust resource damages, the more conservative EPA value should be used for the interpretation of the data.

RESPONSE: The DMEEE fully disclosed the reasons and logic behind the use of a 10% times the PQL when organic samples have been censored (J-flagged) for aggregating parameters, calculating TBPs, or toxicity equivalents. The use of 10% times the PQL still overestimates the actual concentration of the analyte in the matrix and permits the use of the final numbers for comparative purposes. Unreasonably inflating possible concentrations of organic compounds (especially when the values will be used in aggregated results) leads to misleading answers and toxic sediment blanks.

ACTION: No action necessary.

14. COMMENT: Page 62. In the summary the DMEEE cites the document Scott et al. 1994 to demonstrate that levels of contaminants detected in the sediments proposed for dredging should not cause unacceptable impacts to the aquatic environment. However, the presentation of this document in the Tier I evaluation section is not thorough enough to support such a conclusion. We believe that a more thorough analysis should be conducted and presented if this conclusion is to be sustained.

RESPONSE: The summary statement on Page 62 of the DMEEE is primarily related to the discussion of potential water column effects for analytes reported in this study and previous related work (e.g., Scott et al.. 1994). In these studies and in the DMEEE, similar concentrations of several analytes were reported in the effluent water.

ACTION: The summary for the water column effects evaluation will be revised to clarify the meaning of the statement citing the NMFS Wright River weir study.

15. COMMENT: The extensive use of the CDFs by wildlife and the variety of contaminants detected above SQAGs throughout the project area provide adequate evidence that the deepening project may lead to deleterious ecological impacts. Placement of dredged material in CDFs may provide a route of exposure for wildlife that use these impoundments for resting, breeding and foraging. A recent study by Winger and Lasier, 1997 showed that certain metals were bioavailable and bioaccumulated in livers of birds and raccoons to concentrations higher than those in dredged sediment materials. Liver metal concentrations were significantly higher in raccoons collected near the disposal than those in liver from raccoons collected from an upland control site. Accumulation of chlorinated organic contaminants has also been documented in eggs of black-necked stilts nesting within the disposal areas (USFWS, unpublished report).

Therefore, contaminants in dredged material may be mobile and biologically available to wildlife frequenting these areas. In addition, the presence of elevated contaminant concentrations in elutriate samples suggest that drainage from disposal areas may impact habitat quality in the wetland areas that receive discharges from dredging activities. Placement of the material in the ODMDS may lead to even further water quality affects that may be detrimental to aquatic organisms. Disturbance of the sediments during dredging activities may liberate sediment-bound contaminants into the water column where they would be more biologically available to aquatic species. Accumulation of these contaminants in the aquatic ecosystem may result in further exposure to wildlife that feed within this system.

RESPONSE: The DMEEE will be revised to ensure that bioaccumulative compounds present in the proposed dredged material and the existing project O&M material will not create an unacceptable risk to avian wildlife sharing the Harbor CDF system. ATM has been trying to obtain a copy of the recent Winger & Lasier (1997) study that connects dredged material analyte concentrations to tissue values in birds in mammals. We will review this report and incorporate the additional data into the terrestrial effects analysis.

The DMEEE presents a complete Tier I and Tier II evaluation according to the approved procedures for Section 103 and Section 404 dredged material effects evaluations. The report provided adequate evidence that the deepening project is not likely to lead to deleterious ecological impacts especially since the bulk of the project material is not anthropogenically enriched. The existing project O&M material, which was also evaluated with the project sediments, contains the bulk of the enrichment; the study concluded that these sediments are unlikely to create unacceptable adverse effects. Further evaluation will be conducted for terrestrial effects and on TBT, but the relatively low concentrations of toxic constituent compounds in the dredged material are not expected to incrementally deteriorate the habitat in the CDFs by producing measurable impacts.

Water column effects evaluations were conducted for both State receiving waters and the federal waters at the ODMDS. Appropriate tools and procedures outlined in the guidance documentation were implemented and the discharges found to be in compliance. Resuspension of dredged material during project construction is not expected to produce unacceptable risks to aquatic life. Resuspension of dredged material is not even considered under Section 404 because effects are seldom observed. Normal tidal action in the river on a semi-diurnal basis resuspends for more material than any inefficiencies a cutterhead dredge may have in entraining and capturing loosened sediments during the excavation process.

16. COMMENT: We recommend that a revised DMEEE be prepared to address these concerns before the Savannah Harbor project is finalized and sent to Congress for approval. We also recommend that all environmental documents be revised to reflect corrections in the DMEEE.

RESPONSE: The DMEEE will be revised to reflect the changes detailed in the above comment responses. Should changes be required to the EIS or other environmental documents as result of these DMEEE revisions, they will be made in the appropriate locations in those documents.

United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Water Resources Division
South Carolina District
720 Gracern Road, Suite 129
Columbia, SC 29210-7651

June 19, 1998

Mr. M.J. Yuschishin
Planning Division
Department of the Army
Savannah District, Corps of Engineers
P.O. Box 889
Savannah, Ga. 31402-0889

Dear Mr. Yuschishin,

Thank you for the opportunity to review the Draft Feasibility Report and Draft Environmental Impact Statement (EIS) for the deepening of the Savannah Harbor, Georgia. Although there are many interesting issues covered in these documents, my review comments will generally be limited to the hydrodynamic and water-quality modeling sections. Being able to synthesize the output from a complex three-dimensional model is not a trivial or easy task, and the authors of the EIS are to be commended for clearly showing the impacts of the deepening on a complex estuarine system. Overall, my comments concern the need for a clearer presentation and documentation of the performance of the model as applied to the existing conditions in the EIS rather than concerns with presentation of the results. My general comments follow with my specific comments numbered below.

Simulation models are valuable tools for assessing the potential impacts to environmental systems, especially in the case of substantial environmental changes to a system such as the deepening of the harbor. In order to assess the impacts of the deepening on the salinity and dissolved oxygen in the system, it is also necessary to document the ability of the model to simulate the natural conditions measured in the Harbor from July to September 1997. In general, the EIS and the support documents -- *Hydrodynamic and Water-Quality Modeling of the Lower Savannah River Estuary and Analysis of the Historical Data for the Lower Savannah River Estuary*, summarize the model application and the results from the model simulations of pre- and post-deepening impacts on the salinity and dissolved oxygen regime in the system. A lot of the information in the support documents ought to be in the EIS.

The clarity and usefulness of the EIS sections could be greatly improved by showing the reader how well the model predicted the measured field data either by (1) including a section on the modeling before the discussion on the relative impacts of the deepening on the salinity and dissolved oxygen or by (2) including the section in the appendix of the EIS.

1) Although the measured and simulated salinity time series compare favorably for the stations in the navigation channel, the comparisons are not as favorable at the stations in the critical areas near the freshwater marsh. In *Hydrodynamic and Water-Quality Modeling of the Lower Savannah River Estuary* (referenced in the EIS), table 3-4 show that the maximum simulated and measured salinity concentrations to be 5.6 and 9.4 parts per thousand (ppt), respectively, for station GPA 10b. For station GPA 7b, the maximum simulated and measured salinity concentrations are 4.0 and 11.0 ppt, respectively. In addition, Figure 3-21, in the same report, clearly shows that the amplitude of the time series of simulated salinity data to be much smaller than that of the measured data.

The significance of these differences, and one that the reader of the EIS should be aware of, is that the results from the model simulations showing the impacts of the deepening will be underpredicted in these areas of the model. The reader of the EIS, who has not read the *Hydrodynamic and Water-Quality Modeling of the Lower Savannah River Estuary* report, would not be aware that the impacts in these areas could be greater than those predicted by the model.

2) In addition to the simulations using the three steady-state flow inflow rates at Clyo, Ga., it would be interesting to see plots of the pre- and post-deepening with the measured data at Clyo for the 100-day period. The plots would show two things; (1)how well the model simulated the measured data (some already shown in the referenced report) and, (2)how the system would react to an actual set of environmental data with time varying inflows.

3) There is a strong discussion and description of the hydrodynamic model and the necessity of using a three-dimensional model as compared to a one-dimensional model. The discussion of the water-quality model is not as thorough. Whereas the hydrodynamic model may be described as "state of the art", the water-quality model algorithm selected is based upon equations developed by Streeter and Phelps in 1925. The water-quality modeling discussion is a little misleading. Although a water-quality model within the QWMAP modeling system is able to simulate eight state variables, the model selected to assess the deepening impacts on the water quality of the harbor only simulates two state variables -- dissolved oxygen and ultimate biochemical oxygen demand. Using a simplified dissolved oxygen model may be completely justified, but the EIS and *Hydrodynamic and Water-Quality Modeling of the Lower Savannah River Estuary* report do not present any analysis of field data to justify using a simple dissolved oxygen model.

Although there is a discussion on what some of the probable physical impacts will be on the dissolved oxygen due to the deepening, there is no discussion on the biological or chemical nature of the water quality of the harbor within the modeling sections of the EIS. The possible impacts of the deepening on the physical process are important to simulate for the post-deepening period, but it is just as important to be able to simulate the predeepening water-quality conditions which may include more complex biological and chemical processes.

4) It is unclear in the EIS and referenced report whether the model is using literature or measured values of deoxygenation rates from the sampling survey. This needs to be clarified and the use of literature values justified if they are being used instead of the measured data.

5) For the hydrodynamic and water-quality models, graphs of the measured and simulated vertical and longitudinal water-quality profiles are needed to demonstrate how well the model is capturing the vertical and longitudinal variations of the physical parameters (temperature, dissolved oxygen, and specific conductance) and ultimate biochemical oxygen demand. In the EIS, plots are shown of longitudinal measured temperature, but the simulated temperatures are not shown. Also, clarify whether temperature is being simulated by the model. In addition, it is mentioned that profiling included dissolved oxygen, as percent saturation, but these data are not shown. These data (along with any chemical data) may help justify the use of the simplified dissolved oxygen model discussed in item 3.

6) A sensitivity analysis of all hydrodynamic and water-quality model inputs and coefficients for the simulated dissolved oxygen and salinities needs to be performed and reported. The results should be in critical areas of the model -- the marshes near the fringe of the freshwater tidal marshes, the striped bass nursery area, and reaches where the harbor stratifies and destratifies.

7) With the large number of dischargers throughout the reaches of the deepening, it is imperative that the effects of these point-source dischargers on the dissolved oxygen concentration be clearly simulated and understood. Figures 4-8, 4-9, and 4-10 of the EIS clearly show the impacts of the deepening in the three flow simulations, and the text provides a good discussion on the physical mechanisms in the system causing the impacts. The EIS shows that the deepening has a dramatic effect on the fate and transport of the effluent loading from the discharge points and the upstream boundary.

The utility of the model could be used to determine what range of loading inputs could be used to maintain the dissolved-oxygen concentrations at the pre-deepening conditions. Would a reduction in the loading from the point-source discharges and/or the upstream boundary restore the dissolved oxygen concentration? If so, how large a reduction would be necessary? Could pre- deepening dissolved-oxygen concentrations be maintained by relocating discharge pipes? These analyzes could be included as an impact avoidance and mitigation action to address a natural resource concern.

Just as a mitigation action to address the loss of wetlands includes the purchase of the necessary acreage of wetlands, the mitigation action to address the degradation of dissolved-oxygen could include the necessary engineering to reduce the effluent concentration of point-source dischargers or the relocation of their discharge pipes.

Again, I commend the authors for their presentation of the results of their modeling study. If you have any questions or concerns, please call me at (803) 750-6140.

Sincerely,

Paul A. Conrads
Hydrologist

cc: Dr. Wiley Kitchens, USGS-BRD

Letter response

United States Department of the Interior
U.S. GEOLOGICAL SURVEY
Water Resources Division
South Carolina District
720 Gracern Road, Suite 129
Columbia, SC 29210-7651

June 19, 1998

1. COMMENT: The authors of the EIS are to be commended for clearly showing the impacts of the deepening on a complex estuarine system.

RESPONSE: No response necessary.

2. COMMENT: Simulation models are valuable tools for assessing the potential impacts to environmental systems, especially in the case of substantial environmental changes to a system such as the deepening of the harbor. In order to assess the impacts of the deepening on the salinity and dissolved oxygen in the system, it is also necessary to document the ability of the model to simulate the natural conditions measured in the Harbor from July to September 1997. In general, the EIS and the support documents, summarize the model application and the results from the model simulations of pre- and post-deepening impacts on the salinity and dissolved oxygen regime in the system. A lot of the information in the supporting documents ought to be in the EIS.

RESPONSE The model calibration results which show the ability of the model to simulate the natural conditions are presented in a separate report entitled "Hydrodynamic and Water Quality Modeling of the Lower Savannah River Estuary". This document is available upon request.

3. COMMENT: The clarity and usefulness of the EIS sections could be greatly improved by showing the reader how well the model predicted the measured field data either by (1) including a section on the modeling before the discussion on the relative impacts of the deepening on the salinity and dissolved oxygen or by (2) including the section in the appendix of the EIS.

RESPONSE: The model calibration results which show the ability of the model to simulate the natural conditions are presented in a separate report entitled "Hydrodynamic and Water Quality Modeling of the Lower Savannah River Estuary". This document is available upon request.

4. COMMENT: (1) Although the measured and simulated salinity time series compare favorably for the stations in the navigation channel, the comparisons are not as favorable at the stations in the critical areas near the freshwater marsh. In *Hydrodynamic and Water-Quality Modeling of the Lower Savannah River Estuary* (referenced in the EIS), table 3-4 show that the maximum simulated and measured salinity concentrations to be 5.6 and 9.4 parts per thousand (ppt), respectively, for station GPA 10b. For station GPA 7b, the maximum simulated and measured salinity concentrations are 4.0 and 11.0 ppt, respectively. In addition, Figure 3-21, in the same report, clearly shows that the amplitude of the time series of simulated salinity data to be much smaller than that of the measured data. The significance of these differences, and one that the reader of the EIS should be aware of, is that the results from the model simulations showing the impacts of the deepening will be underpredicted in these areas of the model. The reader of the EIS, who has not read the supporting documents would not be aware that the impacts in these areas could be greater than those predicted by the model.

RESPONSE: In projecting impacts to marsh species the absolute maximum salinity concentrations are not used. Based upon agreement within the Technical Advisory Group, the 50th percentile of the high tide salinities is used to project the impacts. Comparison of the model projected 90th percentiles with the data show that at all stations in the critical marsh areas (Station 7 is not in the critical marsh areas, i.e. above the 0.5 ppt contour line) the model overprojects the 90th percentile salinities. The revised model report presents this data. The 90th percentile of all the salinities is reflective of the 50th percentile of the high tide salinities. In addition, the model projected net difference (i.e. the pre-versus post-project difference) is used not the model projected absolute levels. Sensitivity analyses on the model have shown that just because the model projects higher absolute salinity concentrations the net pre- versus post-project differences aren't necessarily larger.

5. COMMENT: (2) In addition to the simulations using the three steady-state flow inflow rates at Clyo, Ga., it would be interesting to see plots of the pre- and post-deepening with the measured data at Clyo for the 100-day period. The plots would show two things; (1)how well the model simulated the measured data (some already shown in the referenced report) and, (2)how the system would react to an actual set of environmental data with time varying inflows.

RESPONSE: The model comparisons to the data are presented in detail in the modeling report. Based upon agreement within the Technical Advisory Group the model was run under prescribed constant flow in order to project impacts.

6. COMMENT: (3) The discussion of the water-quality model is not as thorough. Whereas the hydrodynamic model may be described as "state of the art", the water-quality model algorithm selected is based upon equations developed by Streeter and Phelps in 1925. The water-quality modeling discussion is a little misleading. Although a water-quality model within the QWMAP modeling system is able to simulate eight state variables, the model selected to assess the deepening impacts on the water quality of the harbor only simulates two state variables -- dissolved oxygen and ultimate biochemical oxygen demand. Using a simplified dissolved oxygen model may be completely justified, but the EIS and supporting reports do not present any analysis of field data to justify using a simple dissolved oxygen model.

RESPONSE: In initial meetings of the Technical Advisory Committee the methodology to be used in evaluating the dissolved oxygen impacts was presented and accepted by representatives of the USF&W and EPA. In addition, the model report presents chlorophyl a data which support the assertion that exclusion of the respiratory processes associated with instream phytoplankton is a reasonable assumption in evaluating the "net" impact of the deepening. The EIS and the modeling report will be updated in order to more clearly reflect the assumptions made.

7. COMMENT: Although there is a discussion on what some of the probable physical impacts will be on the dissolved oxygen due to the deepening, there is no discussion on the biological or chemical nature of the water quality of the harbor within the modeling sections of the EIS. The possible impacts of the deepening on the physical process are important to simulate for the post-deepening period, but it is just as important to be able to simulate the predeepening water-quality conditions that may include more complex biological and chemical processes.

RESPONSE: The goal of the EIS is to quantify any impacts the proposed project will have on environmental resources. In the USACOE Reconnaissance study and initial meetings of the Technical Advisory Group the instream parameters identified for evaluation using the model were dissolved oxygen and salinity. The model as applied has been identified through review process to adequately address the impacts of the proposed deepening upon salinity concentrations. These salinity impacts have then been evaluated in light of environmental resources of concern and these have been addressed within the EIS. The impacts of the project upon dissolved oxygen will occur through alteration of the physical process of water column reaeration. The simplified dissolved oxygen methodology was presented and approved at initial Technical Advisory Group meetings and subsequently approved through review by EPA Region IV. In the CED phase, additional work will be performed to supplement the evaluations of the impacts to dissolved oxygen and potentially other instream water quality parameters. This work will be presented in the Tier II EIS to be completed during the CED phase.

8. COMMENT: (4) It is unclear in the EIS and referenced report whether the model is using literature or measured values of deoxygenation rates from the sampling survey. This needs to be clarified and the use of literature values justified if they are being used instead of the measured data.

RESPONSE: The deoxygenation rates used in the model are based upon measured instream Ultimate Oxygen Demand and not from literature values. The EIS will be updated to more clearly state this.

9. COMMENT: (5) For the hydrodynamic and water-quality models, graphs of the measured and simulated vertical and longitudinal water-quality profiles are needed to demonstrate how well the model is capturing the vertical and longitudinal variations of the physical parameters (temperature, dissolved oxygen, and specific conductance) and ultimate biochemical oxygen demand. In the EIS, plots are shown of longitudinal measured temperature, but the simulated temperatures are not shown. Also, clarify whether temperature is being simulated by the model. In addition, it is mentioned that profiling included dissolved oxygen, as percent saturation, but these data are not shown. These data (along with any chemical data) may help justify the use of the simplified dissolved oxygen model discussed in item 3.

RESPONSE: In the revised Modeling Report additional graphs that show the model performance longitidinally and vertically are presented for salinity (this is more appropriate than specific conductance where baroclinic forcing is included). These graphs show RMS errors for both the surface and bottom, RME for both the surface and bottom, and percentile comparisons for both the surface and bottom. These results are presented for both the low flow period and the entire period. In addition, graphical comparisons of the time series for the entire simulation (data versus model) are presented for both surface and bottom data. The simplified dissolved oxygen model calibrations are presented longitudinally in the model report showing percentile comparisons of the model verus data. The goal was to develop a dissolved oxygen model which adequately represents the dissolved oxygen conditions and allows examination of the "relative" difference pre- versus post-project. Additional work to be performed under the CED phase will include supplemental dissolved oxygen modeling and will be presented within the Tier II EIS to be completed during the CED phase. The temperatures are not simulated but are input to the model. Data of Chlorophyl a are presented within the modeling report to aid in justifying the use of the simplified model.

10. COMMENT: (6) A sensitivity analysis of all hydrodynamic and water-quality model inputs and coefficients for the simulated dissolved oxygen and salinities needs to be performed and reported. The results should be in critical areas of the model -- the marshes near the fringe of the freshwater tidal marshes, the striped bass nursery area, and reaches where the harbor stratifies and destratifies.

RESPONSE: Recent revisions to the model report evaluate the sensitivity of the salinity simulations to the critical vertical mixing parameter. This revised report is available for review. In the CED phase additional sensitivity simulations will be performed and presented in the Tier II EIS.

11. COMMENT: (7) With the large number of dischargers throughout the reaches of the deepening, it is imperative that the effects of these point-source dischargers on the dissolved oxygen concentration be clearly simulated and understood. Figures 4-8, 4-9, and 4-10 of the EIS clearly show the impacts of the deepening in the three flow simulations, and the text provides a good discussion on the physical mechanisms in the system causing the impacts. The EIS shows that the deepening has a dramatic effect on the fate and transport of the effluent loading from the discharge points and the upstream boundary.

RESPONSE: The loads to the system were quantified through input of the loadings from Georgia DMR data during the August 1997 period. These data reflect typical loading conditions and in that context the dischargers and their impact to the quantity of oxygen demanding material were included. As the hydrodynamic/salinity model was deemed adequately calibrated the transport within the system was accurate and therefore any alterations that changes to the transport had upon oxygen demanding material were accounted for.

12. COMMENT: The model could be used to determine what range of loading inputs could be used to maintain the dissolved-oxygen concentrations at the pre-deepening conditions. Would a reduction in the loading from the point-source discharges and/or the upstream boundary restore the dissolved oxygen concentration? If so, how large a reduction would be necessary? Could pre- deepening dissolved-oxygen concentrations be maintained by relocating discharge pipes? These analyzes could be included as an impact avoidance and mitigation action to address a natural resource concern. Just as a mitigation action to address the loss of wetlands includes the purchase of the necessary acreage of wetlands, the mitigation action to address the degradation of dissolved-oxygen could include the necessary engineering to reduce the effluent concentration of point-source dischargers or the relocation of their discharge pipes.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive N.
St. Petersburg, Florida 33702

June 12, 1998

Colonel Grant M. Smith
District Engineer, Savannah District
Department of the Army, Corps of Engineers
P.O. Box 889
Savannah, Georgia, 31402-0889

Dear Colonel Smith:

The National Marine Fisheries Service (NMFS) has reviewed the Draft Environmental Impact Statement (DEIS), and Draft Feasibility Report for the Savannah Harbor Expansion Project. The DEIS was conveyed to us by letter dated May 6, 1998, from Mr. M. J. Yuschishin of your staff, and is advertised by a public notice dated May 8, 1998.

It is our understanding that the proposed Harbor Expansion Project is being pursued under the expedited procedures contained in Section 203 of the Water Resources Development Act of 1986 (WRDA 86). This provision stipulates that a non-Federal entity may perform project feasibility studies. including appropriate coordination and environmental studies, under the legal mandates of the Corps of Engineers' (COE) Civil Works Program. Upon completion of required studies, coordination, and review of the feasibility report, the Assistant Secretary of the Army may transmit the report with recommendation(s), to Congress. Congressionally authorized projects may then be eligible for Federal cost sharing.

General Comments

The Draft EIS culminates a highly intensive effort by the Georgia Ports Authority (GPA) and the COE to identify and address environmental impacts of unusual complexity. Complicating factors include the presence of nationally important fish and wildlife resources, the need to understand and model the hydrological regime within a complex aquatic system, the relationship of past and ongoing port activities and system modifications, and the desire for an expedited feasibility study schedule under Section 203.

Despite a laudable effort by GPA to evaluate project effects on the natural environment, the DEIS does not adequately address the potential adverse effects of the harbor expansion project on nationally important fisheries resources. Predicted salinity increases and declines in dissolved oxygen in portions of the Middle River and Front Rivers could detract from and preclude further efforts to restore striped bass and shortnose sturgeon populations in the lower Savannah River. As has been discussed by the resource agencies during interagency meetings, basic fishery resource information specific to the Savannah River system, on which to base evaluation of project effects on these species is lacking. What is known about life history, population dynamics, spatial and temporal distribution of life stages, and critical habitat use areas is based on only limited short-term studies. For example, the identification of important juvenile shortnose sturgeon habitat in the Kings Island Turning Basin (KITB) and the Front River is largely based on a limited study performed prior to the last deepening project and deactivation of the tide gate. Further, a fully coordinated mitigation plan that assures full and adequate mitigation of significant resource impacts has not been developed, and cannot be with the inadequate fisheries resource information currently available. Consequently, the project's effects on striped bass, sturgeons, and the overall tidal freshwater ecosystem in the lower Savannah River remain largely undetermined, but of major importance because the survival of certain fish populations is at risk.

The importance of fishery resources in the lower Savannah River cannot be overemphasized. The river provides essential habitat for riverine and anadromous populations of striped bass *(Morone saxatilis),* and for the Federally listed Endangered shortnose sturgeon *(Acipenser brevirostrum).* Other commercially and recreationally valuable species dependent upon Savannah River habitats include, but are not limited to American shad *(Alosa sapidissima),* river herring *(Alosa aestivalis),* Atlantic sturgeon *(Acipenser oxyrinchus),* spotted seatrout *(Cynoscion nebulosus),* red drum *(Sciaenops ocellatus), shrimp (Penaeus* spp.), blue crab *(Callinectes sapidus),* American oyster *(Crassostrea virginica),* and hard clam *(Mercenaria mercenaria).* The lower Savannah River also contains extensive, but declining acreage of tidal freshwater marsh which is confined largely to the Savannah National Wildlife Refuge. These tidal wetlands have undergone significant adverse modification and loss due to previous and ongoing navigation activities and, despite recent and highly responsible efforts to reverse negative trends, they remain highly vulnerable to adverse change.

As discussed in our March 10, 1998, comments on the Preliminary DEIS, project effects on the lower Savannah River striped bass and shortnose sturgeon populations are among the highest priority issues faced by state and Federal fishery resource management agencies in South Carolina and Georgia. As such, it is imperative that efforts to expand and deepen the Savannah Harbor must proceed with great caution and deliberation. Based on this, we advise that the project. as presently designed, is environmentally unacceptable and that additional information and design features are needed before the NMFS can support a determination that the associated environmental consequence of the selected alternative is not significant.

As pointed out in the following specific comments and conclusion, the degree of impact on nationally important public trust resources, the unreliable nature of ecosystem models, and the inadequacy of the mitigation plan must be addressed.

On a parallel footing with our concerns is our determination that the GPA has put forth a good effort to identify and address the project's environmental impacts. We remain committed to cooperate with the GPA in the development of a project that fulfills their needs and preserves and possibly enhances certain fishery and other environmental conditions within the project area.

Specific Comments

Page 1-6, paragraph 4. According to this section, studies conducted by GPA's agent demonstrate that the boundary of the freshwater plant community has not changed dramatically since removal of the tide gate. Based on discussions with Dr. Wiley Kitchens of the U.S. Geological Survey (USGS), available data suggest that certain Back River wetlands are gradually returning to tidal freshwater marsh following tide gate removal. If agreement cannot be reached regarding the status of this change then, at a minimum, the view and findings of the USGS should be presented.

Page 1-7, paragraph 1. The DEIS presents a plan to mitigate predicted loss of freshwater diversity caused by the project through acquisition of additional freshwater wetlands and adjacent uplands. These lands would be turned over to the Savannah National Wildlife Refuge for management. Although this plan may provide some benefit for the long-term integrity of the Refuge's environment, mere acquisition of existing freshwater wetlands and uplands does not compensate for environmental and ecological impacts associated with adverse alteration of wetlands and possible elimination of highly important fishery resources. This situation should be acknowledged and addressed.

Page 1-7, paragraph 2. The determination that "Model simulations of dissolved oxygen and salinity under the proposed deepening do not predict adverse impacts to striped bass spawning recovery efforts in the Little Back and Back Rivers" is not substantiated. Furthermore, the document fails to provide adequate information on population dynamics, life histories, spatial and temporal distribution of life stages, and response to existing impacts for key species that are of ecological and management concern due to reduced abundance.

The proposed impact avoidance project, involving closure of the connection between the Middle and Front Rivers and reopening New Cut, constitutes a potentially significant action that requires a thorough impact analyses. Proposed deepening of the Port Wentworth Turning Basin to provide an alternative juvenile shortnose sturgeon habitat (to replace impacted habitat in the KITB) seems premature given the inadequate level of basic life history, behavior, and distribution data available for the species following termination of tide gate operation in 1992.

Page 2-6, Section 2.4. Dissolved oxygen data is essentially not available for analysis of historical conditions. Only very limited data has been collected during 1997 to help calibrate the model DO outputs. The existing data is not adequate for purposes of impact analysis and mitigation plan development. A permanent, long-term monitoring program should be established to ensure availability of basic water quality information in connection with this and future navigation and ecosystem management needs in the lower Savannah River ecosystem.

Page 2-8, Section 2.4.4. Effects of the Tide Gate Decommissioning Project on striped bass recovery need to be investigated prior to major alteration within the lower Savannah River. Consideration -study area in which existing or should be given to establishing a striped conservation and study area in which existing or improved environmental conditions are maintained.

Page 2-8, Section 2.4.5. The identified juvenile nursery habitat for the shortnose sturgeon, including the KITB area, has been identified using the best available data. Use of the area by sturgeons is poorly understood and is in need of further study before scientifically based impact evaluations can be made and mitigation measures developed.

Page 3-1, Section 3.1. The feasibility of closing off Middle River as an impact avoidance measure needs further study. This feature constitutes a major action that must also be subjected to an impact analysis.

Page 4-3-7, Section 4.8. The Savannah River is currently the focus of major state and Federal interagency efforts to restore anadromous fish populations. These efforts are critical to restoring fish passage and to the protection and management of key habitats within the basin. As such, the relationship between these efforts and proposed action should be addressed.

Page 4-62. Section 4.9.3. The statement, "The existing Navigation Project is having no unacceptable adverse effect on this species (shortnose sturgeon) or any habitat determined critical for its survival." should be substantiated. Additionally, we recommend that the status of Atlantic sturgeon in the Savannah River system, and any significant project effects be determined and reported.

Page 4-37, 38, Section 4.8. The discussion on fisheries resources should include a summary of existing information on fishery landings attributable to the Savannah River estuarine system, and a discussion of prior impacts of port development on fishery resource habitats; e.g., acres of estuarine marsh filled by spoil disposal and periodic dredging impacts on benthic organisms. The statement that shortnose sturgeon fingerlings are periodically released into the system by the South Carolina Department of Natural Resources is not correct. Additionally, a description of current interagency efforts to restore anadromous fish populations should be included.

Page 4-43, Section 4.8.2. The statement in paragraph 4, "In the Savannah River and its tributaries, salinities were found to be below the lethal limit threshold for striped bass eggs," is not correct. As pointed out by Van Den Avyle, many areas of the lower Savannah have been shown to have salinities exceeding the lethal limit for striped bass eggs. A major concern is the potential reduction of available egg, hatching and larval nursery habitat as increased salinities move further upstream toward spawning habitats.

Page 5-34-36, Section 5.5.1.3, 1-4. Maximum salinity values and duration are not adequately described in these sections. Maximum salinities may have significant effects on egg and larval life stage survival, even for short durations.

Page, 5-42, Section 5.5.1.5. The statement in paragraph 3 that, "Closure of the Middle River . . . has been determined to be a feasible option for avoidance of salinity impacts . . .," is not appropriate. This potential management action could ultimately have merit, but would have to be subjected to a thorough impact analysis before its efficacy can be established.

Additionally, in paragraph 4 it is stated that predicted salinity increases in the Front River would not create any change that would significantly act to reduce the travel time to waters with lethal levels of salinity. The opposite appears to be true. If salinity increases in the upper harbor, it appears that the lethal salinity halocline (<9 ppt) is likely to migrate upstream as well. Further investigation is needed.

Page 5-48, Section 5.6.1.3.1. In the KITB, an area identified as important juvenile habitat for shortnose sturgeon, model outputs predict near bottom dissolved oxygen concentration to be below the acceptable criterion (3.5 mg/L) as much as 50 percent of the time. The effects of dissolved oxygen levels less than 3.5 mg/L of any duration are cause for concern with respect to the KITB, and other areas within the upper estuary that may be used by juvenile shortnose sturgeon. Thorough additional study must be done, possibly including laboratory studies and juvenile distribution surveys, before potentially adverse effects of the deepening project can be ruled out.

Specific Information Needs

The extensive modeling effort undertaken by GPA has been of value in identification of information gaps that must be filled to thoroughly address potential effects of harbor expansion, and to provide a sound basis for mitigation planning. Additionally, the interagency discussions that have taken place at each phase of the modeling study have been tremendously helpful in developing agreement on the uncertainties that must be addressed. However, much work remains to be done, and basic fishery resource information specific to the Savannah River System is needed. Some specific information needs have been identified in our comments above. The NMFS recommends that the Natural Resources Agency Group be convened without delay to identify critical fisheries and perhaps other information needs, and the appropriate mechanisms for fulfilling them. This effort is essentially in progress at this time, in response to the recently authorized WRDA Section 1135 study.

Conclusion

The information presented does not sufficiently describe the effect of the proposed action on the tong-term survival and welfare of remnant populations of striped bass and shortnose sturgeon which inhabit the lower Savannah River. The possibility that deepening the harbor, as planned, will result in further adverse impacts and possible extirpation of these nationally important species cannot be ruled out. An adequate mitigation plan to offset adverse impacts caused by changes in salinity and dissolved oxygen also has not been developed. Consequently, the current project schedule, which calls for preparation of the Final EIS and Congressional authorization during 1998, seems unrealistic and should be reexamined. Alternatively, a conditional authorization could be sought that guarantees appropriate study, selection of an acceptable project alternative, and implementation of full mitigation, concurrent with project construction.

To minimize the possibility that the Final EIS would be unacceptable to the NMFS and others, we encourage preparation of a supplement to the DEIS. The supplemented document should either (1) provide sufficient information to fully support the determination that unacceptable environmental harm will not occur with the selected alternative, or (2) it should call for a less damaging alternative.

As we have discussed in meetings with the GPA and others, we believe that the project presents an opportunity whereby harbor improvements, fish and wildlife resource protection, and possible enhancement of environmental conditions may be possible. In connection with this, the NMFS is amenable to a phased approach to the project whereby environmental standards pertaining to salinity and dissolved oxygen are predetermined for the Front, Middle, and Back Rivers and harbor deepening and needed hydrologic modification are allowed to proceed in a phased and closely monitored fashion. For example, it may be possible to identify target salinity and dissolved oxygen levels and locations, implement the needed hydrologic modification(s) needed to sustain or enhance these conditions, and then proceed with specified deepening. This process differs from that which is presently proposed in that it establishes target environmental conditions and implements needed hydrologic and other modifications prior to harbor deepening.

In accordance with the Endangered Species Act of 1973, as amended, it is the responsibility of the appropriate Federal regulatory agency to review its activities and programs and to identify any activity or programs that may affect endangered or threatened species and their habitat. If it is determined that these activities may adversely affect any species listed as endangered or threatened, formal consultation with our Division of Protected Resources must be initiated. The appropriate contact for matters pertaining to protected species is Mr. Charles Oravetz who may be contacted at the letterhead address or at (813) 570-5312. Mr. David Rackley or Mr. Prescott Brownell of our Charleston Area Office should be contacted regarding technical aspects of the comments we have provided.

Finally, it should be understood that nationally important fishery resources are at stake in planning the Savannah Harbor Expansion Project and the NMFS may, depending on the proposal adopted in the Final EIS and supporting information, refer this project to the Council on Environmental Quality under Section 1504 of the Council's Regulations for implementing the Procedural Provisions of the National Environmental Policy Act. At the same time, I am confident that an important opportunity exists to establish a partnership effort to address long-term maintenance and restoration of important natural resources of the Savannah River Ecosystem, in concert with needed port development. To this end we are committed to working with you and the interagency team toward an acceptable resolution of remaining issues.

Sincerely,

Andrew J. Kemmerer
Regional Administrator

Letter response

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9721 Executive Center Drive N.
St. Petersburg, Florida 33702

June 12, 1998

General Comments

1. COMMENT: Despite a laudable effort by GPA to evaluate project effects on the natural environment, the DEIS does not adequately address the potential adverse effects of the harbor expansion project on nationally important fisheries resources. Predicted salinity increases and declines in dissolved oxygen in portions of the Middle River and Front Rivers could detract from and preclude further efforts to restore striped bass and shortnose sturgeon populations in the lower Savannah River. As has been discussed by the resource agencies during interagency meetings, basic fishery resource information specific to the Savannah River system, on which to base evaluation of project effects on these species is lacking.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

2. COMMENT: A fully coordinated mitigation plan that assures full and adequate mitigation of significant resource impacts has not been developed, and cannot be with the inadequate fisheries resource information currently available. Consequently, the project's effects on striped bass, sturgeons, and the overall tidal freshwater ecosystem in the lower Savannah River remain largely undetermined, but of major importance because the survival of certain fish populations is at risk.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

3. COMMENT: The importance of fishery resources in the lower Savannah River cannot be overemphasized. The river provides essential habitat for riverine and anadromous populations of striped bass, and for the Federally listed Endangered shortnose sturgeon. Other commercially and recreationally valuable species dependent upon Savannah River habitats include, but are not limited to American shad, river herring, Atlantic sturgeon, spotted seatrout, red drum, *shrimp*, blue crab, American oyster, and hard clam. The lower Savannah River also contains extensive, but declining acreage of tidal freshwater marsh which is confined largely to the Savannah National Wildlife Refuge. These tidal wetlands have undergone significant adverse modification and loss due to previous and ongoing navigation activities and, despite recent and highly responsible efforts to reverse negative trends, they remain highly vulnerable to adverse change.

RESPONSE: The value of these resources is recognized in the DEIS. The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

4. COMMENT: Project effects on the lower Savannah River striped bass and shortnose sturgeon populations are among the highest priority issues faced by state and Federal fishery resource management agencies in South Carolina and Georgia. As such, it is imperative that efforts to expand and deepen the Savannah Harbor must proceed with great caution and deliberation. Based on this, we advise that the project, as presently designed, is environmentally unacceptable and that additional information and design features are needed before the NMFS can support a determination that the associated environmental consequence of the selected alternative is not significant. As pointed out in the following specific comments and conclusion, the degree of impact on nationally important public trust resources, the unreliable nature of ecosystem models, and the inadequacy of the mitigation plan must be addressed.

RESPONSE: The value of these resources is recognized in the DEIS. The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

Specific Comments

5. COMMENT: Page 1-6, paragraph 4. According to this section, studies demonstrate that the boundary of the freshwater plant community has not changed dramatically since removal of the Tidegate. Based on discussions with Dr. Wiley Kitchens of the U.S. Geological Survey (USGS), available data suggest that certain Back River wetlands are gradually returning to tidal freshwater marsh following Tidegate removal. If agreement cannot be reached regarding the status of this change then, at a minimum, the view and findings of the USGS should be presented.

RESPONSE: Please see Attachment A, Response to the Evaluation of the Ecological Report.

6. COMMENT: Page 1-7, paragraph 1. The DEIS presents a plan to mitigate predicted loss of freshwater diversity caused by the project through acquisition of additional freshwater wetlands and adjacent uplands. Although this plan may provide some benefit for the long-term integrity of the Refuge's environment, mere acquisition of existing freshwater wetlands and uplands does not compensate for environmental and ecological impacts associated with adverse alteration of wetlands and possible elimination of highly important fishery resources.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

7. COMMENT: Page 1-7, paragraph 2. The determination that "Model simulations of dissolved oxygen and salinity under the proposed deepening do not predict adverse impacts to striped bass spawning recovery efforts in the Little Back and Back Rivers" is not substantiated. Furthermore, the document fails to provide adequate information on population dynamics, life histories, spatial and temporal distribution of life stages, and response to existing impacts for key species that are of ecological and management concern due to reduced abundance.

RESPONSE: The modeling results for the future condition, shown in DEIS Tables 5-5 (salinity) and 4-6 (DO), indicate that the model tolerance criterion of 1 ppt for spawning conditions will not be exceeded in the historical spawning grounds of the Little Back River and Back Rivers. Therefore, in terms of salinity and dissolved oxygen, impedance to recovery efforts in the traditional spawning areas is unlikely. Egg transport studies to be done in the next phase of the DEIS will further explore the effect of the predicted future conditions on egg survival. The modeling of egg transport can be used to determine possible hydrodynamic areas of concern to the recovery of the striped bass.

The DEIS summarized the most current knowledge on population dynamics, life histories, spatial and temporal distributions of life stages for striped bass and shortnose sturgeon. Spawning conditions pertaining to the ongoing recovery program was selected as the main striped bass issue to be addressed in the DEIS. The DEIS also examines, as required by NEPA, potential impacts to all listed species (threatened and endangered).

8. COMMENT: The proposed impact avoidance project, involving closure of the connection between the Middle and Front Rivers and reopening New Cut, constitutes a potentially significant action that requires a thorough impact analyses.

RESPONSE: See Response to Comment #10 in USFWS letter dated June 22, 1998.

9. COMMENT: The proposed deepening of the Port Wentworth Turning Basin to provide an alternative juvenile shortnose sturgeon habitat (to replace impacted habitat in the KITB) seems premature given the inadequate level of basic life history, behavior, and distribution data available for the species following termination of Tidegate operation in 1992.

RESPONSE: Concur. The proposal for the deepening of the Port Wentworth Turning Basin is contingent upon the results of studies and input from agency specialists and would only be implemented with agency consensus. While recognizing that little knowledge presently exists for successful implementation of such habitat extension efforts the proposal has been made on the assumption that greater knowledge for evaluation of such improvements may come into existence in the near future as a result of the proposed studies.

10. COMMENT: Page 2-6, Section 2.4. Dissolved oxygen data is essentially not available for analysis of historical conditions. Only very limited data has been collected during 1997 to help calibrate the model DO outputs. The existing data is not adequate for purposes of impact analysis and mitigation plan development. A permanent, long-term monitoring program should be established to ensure availability of basic water quality information in connection with this and future navigation and ecosystem management needs in the lower Savannah River ecosystem.

RESPONSE: Post-project monitoring will be considered in development of the final mitigation plan to be determined after further studies during the CED phase.

11. COMMENT: Page 2-8, Section 2.4.4. Effects of the Tidegate decommissioning on striped bass recovery need to be investigated prior to major alteration within the lower Savannah River. Consideration should be given to establishing a striped bass conservation and study area in which existing or improved environmental conditions are maintained.

RESPONSE: Post-project monitoring and conservation measures will be considered in development of the final mitigation plan to be determined after further studies during the CED phase.

12. COMMENT: Page 2-8, Section 2.4.5. The juvenile nursery habitat for the shortnose sturgeon, including the KITB area, has been identified using the best available data. Use of the area by sturgeons is poorly understood and is in need of further study before scientifically based impact evaluations can be made and mitigation measures developed.

RESPONSE: Concur. The proposal for the deepening of the Port Wentworth Turning Basin is contingent upon the results of studies and input from agency specialists and will only be implemented with agency consensus. While recognizing that little knowledge presently exists for successful implementation of such habitat extension efforts the proposal has been made on the assumption that greater knowledge for evaluation of such improvements may come into existence in the near future as a result of the proposed studies.

13. COMMENT: Page 3-1, Section 3.1. The feasibility of closing off Middle River as an impact avoidance measure needs further study. This feature constitutes a major action that must also be subjected to an impact analysis.

RESPONSE: See Response to Comment #10 in USFWS letter dated June 22, 1998.

14. COMMENT: Page 4-3-7, Section 4.8. The Savannah River is currently the focus of major state and Federal interagency efforts to restore anadromous fish populations. These efforts are critical to restoring fish passage and to the protection and management of key habitats within the basin. As such, the relationship between these efforts and proposed action should be addressed.

RESPONSE: These restoration efforts were considered in the DEIS and will be further evaluated in the additional studies to be performed in the CED phase.

15. COMMENT: Page 4-62. Section 4.9.3. The statement, "The existing Navigation Project is having no unacceptable adverse effect on this species (shortnose sturgeon) or any habitat determined critical for its survival." should be substantiated. Additionally, we recommend that the status of Atlantic sturgeon in the Savannah River system, and any significant project effects be determined and reported.

RESPONSE: Concur. The statement will be removed from the report, since the database for drawing such a conclusion does not exist. Removal, however is simply an acknowledgement that no inference can be made at this time due to the paucity of field data. The Atlantic Sturgeon is not listed as an Endangered Species and was therefore not specially studied in this project.

16. COMMENT: Page 4-37, 38, Section 4.8. The discussion on fisheries resources should include a summary of existing information on fishery landings attributable to the Savannah River estuarine system, and a discussion of prior impacts of port development on fishery resource habitats; e.g., acres of estuarine marsh filled by spoil disposal and periodic dredging impacts on benthic organisms.

RESPONSE: Advanced maintenance dredging in the Savannah Harbor is a routine and ongoing operation. Benthic organisms are subject to continuous disequilibrium and removal. Information on fishing landings or the extent of fishing in the Savannah River was not studied in the DEIS. The cumulative effects of dredging on wetlands in the Savannah River over the entire historical record of Savannah Harbor's operations was not undertaken in the DEIS. The project, however, studied the most recent impacts on wetlands and the predicted impacts of the proposed deepening.

17. COMMENT: Page 4-37, 38 Section 4.8. The statement that shortnose sturgeon fingerlings are periodically released into the system by the South Carolina Department of Natural Resources is not correct.

RESPONSE: Concur. The sentence has been eliminated.

18. COMMENT: A description of current interagency efforts to restore anadromous fish populations should be included.

RESPONSE: Concur. A list of interagency efforts to restore anadromous fish populations will be included.

19. COMMENT: Page 4-43, Section 4.8.2. The statement in paragraph 4, "In the Savannah River and its tributaries, salinities were found to be below the lethal limit threshold for striped bass eggs," is not correct. As pointed out by Van Den Avyle, many areas of the lower Savannah have been shown to have salinities exceeding the lethal limit for striped bass eggs. A major concern is the potential reduction of available egg, hatching and larval nursery habitat as increased salinities move further upstream toward spawning habitats.

RESPONSE: Concur. Statement has been removed.

20. COMMENT: Page 5-34-36, Section 5.5.1.3, 1-4. Maximum salinity values and duration are not adequately described in these sections. Maximum salinities may have significant effects on egg and larval life stage survival, even for short durations.

RESPONSE: Maximum salinities are not used in the DEIS because a statistical representation was determined to better represent effects on biological organisms. Modeling report has examined these issues in Sections 4.1 page 4-1.

21. COMMENT: Page 5-42, Section 5.5.1.5. The statement in paragraph 3 that, "Closure of the Middle River . . . has been determined to be a feasible option for avoidance of salinity impacts . . .," is not appropriate. This potential management action could ultimately have merit, but would have to be subjected to a thorough impact analysis before its efficacy can be established.

RESPONSE: See Response to Comment #10 in USFWS letter dated June 22, 1998.

22. COMMENT: In paragraph 4 it is stated that predicted salinity increases in the Front River would not create any change that would significantly act to reduce the travel time to waters with lethal levels of salinity. The opposite appears to be true. If salinity increases in the upper harbor, it appears that the lethal salinity halocline (<9 ppt) is likely to migrate upstream as well. Further investigation is needed.

RESPONSE: In order to evaluate concerns of egg transport into areas of lethal salinity, egg transport studies will be conducted in the next phase of the DEIS.

23. COMMENT: Page 5-48, Section -5.6.1.3.1. In the KITB, an area identified as important juvenile habitat for shortnose sturgeon, model outputs predict near bottom dissolved oxygen concentration to be below the acceptable criterion (3.5 mg/L) as much as 50 percent of the time. The effects of dissolved oxygen levels less than 3.5 mg/L of any duration are cause for concern with respect to the KITB, and other areas within the upper estuary that may be used by juvenile shortnose sturgeon. Thorough additional study must be done, possibly including laboratory studies and juvenile distribution surveys, before potentially adverse effects of the deepening project can be ruled out.

RESPONSE: The proposed project will take steps to avoid, through mitigation, DO decreases that would cause adverse impacts to the SNS. In addition the project will fund long-term studies to ascertain any potential adverse impacts to SNS and these studies will serve as early warning controls for avoiding or correcting any future impacts.

Specific Information Needs

24. COMMENT: Request.
The extensive modeling effort undertaken by GPA has been of value in identification of information gaps that must be filled to thoroughly address potential effects of harbor expansion, and to provide a sound basis for mitigation planning. Additionally, the interagency discussions that have taken place at each phase of the modeling study have been tremendously helpful in developing agreement on the uncertainties that must be addressed. However, much work remains to be done, and basic fishery resource information specific to the Savannah River System is needed. Some specific information needs have been identified in our comments above. The NMFS recommends that the Natural Resources Agency Group be convened without delay to identify critical fisheries and perhaps other information needs, and the appropriate mechanisms for fulfilling them. This effort is essentially in progress at this time, in response to the recently authorized WRDA Section 1135 study.

RESPONSE: The value of these resources is recognized in the DEIS. The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. The mitigation process will establish a stakeholders evaluation group which will develop a plan of studies.

Conclusion

25. COMMENT: The information presented does not sufficiently describe the effect of the proposed action on the long-term survival and welfare of remnant populations of striped bass and shortnose sturgeon which inhabit the lower Savannah River. The possibility that deepening the harbor, as planned, will result in further adverse impacts and possible extirpation of these nationally important species cannot be ruled out. An adequate mitigation plan to offset adverse impacts caused by changes in salinity and dissolved oxygen also has not been developed. Consequently, the current project schedule, which calls for preparation of the Final EIS and Congressional authorization during 1998, seems unrealistic and should be reexamined. Alternatively, a conditional authorization could be sought that guarantees appropriate study, selection of an acceptable project alternative, and implementation of full mitigation, concurrent with project construction.

RESPONSE: See response to Comment #1 in NMFS letter dated June 12, 1998.

26. COMMENT: To minimize the possibility that the Final EIS would be unacceptable to the NMFS and others, we encourage preparation of a supplement to the DEIS. The supplemented document should either (1) provide sufficient information to fully support the determination that unacceptable environmental harm will not occur with the selected alternative, or (2) it should call for a less damaging alternative.

RESPONSE: The final study documents recommend construction of a 48-foot authorized navigation project, which would have less environmental impacts than the originally proposed 50-foot authorized depth. GPA will prepare a separate Tier II EIS to document the studies conducted during the CED phase and their conclusions.

27. COMMENT: We believe that the project presents an opportunity whereby harbor improvements, fish and wildlife resource protection, and possible enhancement of environmental conditions may be possible. In connection with this, the NMFS is amenable to a phased approach to the project whereby environmental standards pertaining to salinity and dissolved oxygen are predetermined for the Front, Middle, and Back Rivers and harbor deepening and needed hydrologic modification are allowed to proceed in a phased and closely monitored fashion. For example, it may be possible to identify target salinity and dissolved oxygen levels and locations, implement the needed hydrologic modification(s) needed to sustain or enhance these conditions, and then proceed with specified deepening. This process differs from that which is presently proposed in that it establishes target environmental conditions and implements needed hydrologic and other modifications prior to harbor deepening.

RESPONSE: See response to Comment #24 in NMFS letter dated June 12, 1998.

28. COMMENT: In accordance with the Endangered Species Act of 1973, as amended, it is the responsibility of the appropriate Federal regulatory agency to review its activities and programs and to identify any activity or programs that may affect endangered or threatened species and their habitat. If it is determined that these activities may adversely affect any species listed as endangered or threatened, formal consultation with our Division of Protected Resources must be initiated.

RESPONSE: The DEIS was coordinated with the NMFS' Division of Protected Species under Section 7 of the ESA. The DEIS concluded that formal consultation would not be necessary for any species as long as the avoidance and habitat measures proposed in the BATES were implemented.

29. COMMENT: It should be understood that nationally important fishery resources are at stake in planning the Savannah Harbor Expansion Project and the NMFS may, depending on the proposal adopted in the Final EIS and supporting information, refer this project to the Council on Environmental Quality under Section 1504 of the Council's Regulations for implementing the Procedural Provisions of the National Environmental Policy Act. At the same time, I am confident that an important opportunity exists to establish a partnership effort to address long-term maintenance and restoration of important natural resources of the Savannah River Ecosystem, in concert with needed port development. To this end we are committed to working with you and the interagency team toward an acceptable resolution of remaining issues.

RESPONSE: GPA is encouraged that the NMFS recognizes that port development is needed and that NMFS is willing to work toward an acceptable resolution of the remaining issues.

State Agencies

Georgia Department of Natural Resources

Georgia Department of Natural Resources

205 Butler Street, S.E., Suite 1252 East Tower, Atlanta, Georgia 30334-4100
Lonice C. Barrett, Commissioner
(404) 656-3500
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July 1, 1998

Colonel Grant Smith
District Engineer
U.S. Army Corps of Engineers,
Savannah District
Post Office Box 889
Savannah, Georgia 31402

RE: Savannah Harbor Expansion

Dear Colonel Smith:

The Department of Natural Resources (DNR) has reviewed the DEIS for the Savannah Harbor Expansion and has attended numerous meetings to discuss mitigation of impacts which will result from the Harbor expansion. The Draft Environmental Impact Statement (DEIS) for the proposed Savannah Harbor Deepening Project represents an intensive effort by the Georgia Ports Authority (GPA) and Savannah District Corps of Engineers (COE) to identify and address environmental impacts of unusual complexity. Complicating factors include the presence of nationally important fish and wildlife resources, the need to understand and model the hydrological regime within a complex aquatic system, the relationship of past and proposed harbor improvement activities and lower river channel modifications, and the desire for an expedited "fast-track" feasibility study schedule under Section 203 of the Water Resources Development Act of 1986 (WRDA 86).

Despite a commendable effort by GPA and the consulting firm Applied Technology Management (ATM) to evaluate harbor deepening effects on the natural environment, the DEIS is incomplete in content, omits significant information that is needed to fully evaluate impacts, and does not adequately address potential adverse effects on nationally important fisheries and cultural resources and the additional loss of valuable tidal freshwater marsh on and around the Savannah National Wildlife Refuge. Predicted salinity increases and dissolved oxygen declines in portions of the Middle and Front Rivers, resulting from the proposed eight-foot channel deepening project will detract from and could likely preclude

further efforts to restore striped bass and shortnose sturgeon populations in the lower Savannah River by reducing the small remaining amount of suitable habitat. The draft document does not include a thorough discussion of mitigation options for striped bass or data requested on 20 January 1998 from recommended mitigation model runs to determine whether an eight-foot deepening project might preclude restoration of critical Back River striped bass spawning habitat to pre-tide gate condition (bathymetry). This potential restoration opportunity will be evaluated through a recently authorized WRDA Section 1135 feasibility study. The Back River tide gate operation caused a number of impacts, including increased salinity and loss of suitable spawning habitat which has not been totally mitigated. Decommissioning the tide gate and closure of New Cut has not resulted in restoration of the Back River as the once primary spawning area for striped bass in the Savannah River. In spite of supplemental stocking and an increase in adult numbers, the striped bass population has not recovered as anticipated. Restoration of striped bass spawning and nursery habitat to support a self-sustaining Savannah River striped bass population is a primary DNR goal. Mitigation model runs for Back River restoration need to be conducted prior to determination of the selected project alternative.

The primary project mitigation measure, closure of Middle River, is a major modification of the Lower Savannah River and constitutes a potentially significant action that requires a thorough impact analysis. No model results are provided to evaluate the hydrodynamic impacts, and the feasibility of closing off Middle River has not been established. While this action would prevent salinity intrusion into the lower portion of Middle River, it would also increase salinity intrusion up Front River. Additional impacts to tidal freshwater marsh and tidal forested wetlands would be shifted from Middle River to Front River. Most of the limited striped bass reproduction that remains occurs in the Front River upstream of U.S. Highway 17. The extent to which reproduction may eventually recover in Back River with appropriate restoration measures in place is not known at this time. Under typical spring spawning season river flows, areas of the Front River downstream of Talmadge Bridge have salinities exceeding the lethal level for striped bass eggs and larval forms. Because the project would increase salinity in Front River above current conditions, it would likely render a substantial area upriver of Talmadge Bridge unsuitable for striped bass egg and larval development and survival following spawning and potentially impact spawning and juvenile nursery areas upstream of U.S. Highway 17 bridge during low flow periods. Middle River closure could also cause adverse changes in water level, sedimentation rate, current velocity, fish and wildlife movement in Back River and Middle River and water quality at the City of Savannah's raw water intake at Abercorn Creek.

Dissolved oxygen within the harbor channel is frequently lower than the level needed to support a healthy aquatic community. The proposed project will further depress existing low dissolved oxygen levels and as stated in the DEIS "post-project conditions in the Kings Island Turning Basin (KITB) wilt exceed the environmental tolerances of juvenile shortnose sturgeon" which have traditionally used KITB as a nursery and foraging area. Proposed deepening of the Port Wentworth Turning Basin (PWTB) to provide an alternative juvenile shortnose sturgeon habitat (to replace impacted habitat in KITB) appears premature given the inadequate availability of basic life history, behavior and distribution data available for the species following termination of Back River tide gate operation in 1992 and the

completion of the previous channel deepening project in 1994. However, the three-year study proposed in the DEIS is a positive measure for filling in critical information gaps, and should be coordinated with South Carolina DNR (Collins et al.) and conducted prior to any deepening of PWTB. It is our understanding that pre-project baseline salinity incursions up the Front and Middle Rivers have been found to be substantially greater than predicted in association with the previous channel deepening project and could negate the suitability of the PWTB as a replacement for KITB as a juvenile sturgeon refuge.

The lower Savannah River contains extensive but declining acreage of tidal freshwater marsh which is confined largely to the Savannah National Wildlife Refuge. Tidal freshwater marsh supports an extremely diverse plant community providing food, cover and nesting habitat for a variety of fish and wildlife species. Tidal freshwater marsh is unique and relatively scarce in comparison to salt marshes. Because of its scarcity and its high fish and wildlife value, resource agency goals have been to restore and maintain tidal freshwater marsh in the lower Savannah River. These tidal wetlands have undergone significant adverse modification and loss due to previous Savannah Harbor navigation project improvements, and, despite recent and highly responsible efforts to reverse negative trends, they remain highly vulnerable to incremental and cumulative salinity changes.

The proposed plan for Harbor expansion suggests installation of sheet piles to protect Old Fort Jackson. Departmental experts reviewed the plan and visited Old Fort Jackson. Because there are numerous unknowns associated with the expansion project, I do not believe the proposed measures will adequately protect the Fort. Therefore, the sheet pile wall designated as "additional" in the information provided by the Georgia Ports Authority should be made part of the sheet pile wall included in the project. Installation of the sheet pile wall should be coordinated with the Department's Chief Engineer, David Freedman.

Placement of beach quality sand into areas outside of the sand sharing system is a loss of a valuable natural resource. Tybee Island is experiencing erosion. As it is becoming more and more recognized, the Savannah Harbor impacts Tybee's beaches. Beach quality sand should be considered for placement along Tybee Island. Although little data exist on the likelihood of beach quality sand from the Project, if more sand is found from additional corings, then procedures should be implemented which consider placement of that sand onto Tybee's beaches.

The Savannah Harbor Expansion project should be coordinated with the authorized Island-wide beach renourishment project planned for Tybee Island. Beach quality sand should not be placed on islands outside of the influence of the Harbor and, therefore, DNR requests you remove any reference within the EIS to placement of sand on Daufuski Island, SC.

The DEIS document only addresses the maximum eight-foot deepening option and does not include analyses of incremental deepening options, even though engineering and economic analyses were performed at two-foot intervals. This lack of incremental model predictions on salinity and dissolved oxygen impacts does not allow an informed alternatives analysis to be conducted on the project. The DEIS implies that water quality impacts of deepening are linear, but there is no data to support that assumption.

The potential effects on the lower Savannah River ecology, sand sharing system, historic resources, water quality, and striped bass and shortnose sturgeon populations from the most extensive harbor deepening project proposed to date are among the highest priority issues presently under consideration by DNR. As such, it is imperative that efforts to expand and deepen the Savannah Harbor must proceed with great caution and deliberation. Understanding the importance of this project to GPA and the economy of Georgia by maintaining a competitive Port of Savannah, we have an obligation to the people of Georgia, our recreational users and our environmental constituents to insure no significant environmental impacts occur as a result of this proposed harbor improvement plan. Based on this, we must advise that the project and proposed mitigation, as presented in the DEIS, are environmentally unacceptable at this point and that additional information and design features are needed before DNR can support a determination that the associated environmental consequences of the selected alternative are not significant. The degree of impact on nationally important public trust resources, the proper calibration of lower Savannah ecosystem models, and the perceived inadequacy of the proposed mitigation plan for the single project alternative discussed must be addressed.

The Director of the Environmental Protection Division of the DNR is authorized to issue Section 401 certifications in the State of Georgia. A certification is issued if a project will not cause a violation of water quality standards. EPD has reviewed the DEIS and must advise you that a Section 401 certification for the Savannah Harbor Expansion cannot be issued until the following water quality standard issues are resolved:

1. The project as proposed will lower the dissolved oxygen concentration in the Savannah River. These concentrations are already at critical levels. This proposed reduction must be acceptably mitigated or eliminated.

2. The project could increase the salinity of the water of Abercorn Creek, an important source of individual and domestic water supply for the City of Savannah. The project must not adversely affect the users of the city's water system. The applicant must show that there will be no adverse impact, or must develop an acceptable mitigation plan.

GPA has put forth a good effort to identify and address the project's environmental impacts under its self-imposed "fast-track" schedule. The modeling effort by GPA and ATM has been very helpful in identification of information gaps and deficiencies that must be addressed to more completely address project impacts and form a sound basis for mitigation planning. Interagency discussions of the Technical Advisory Group and Resource Agency Group which occurred at each phase of the modeling study were extremely beneficial in developing agreement on the uncertainties that must be addressed. However, much work remains to be done, and additional fishery resource information specific to the Savannah River System is needed. The possibility that harbor deepening, as planned, will result in substantial adverse impacts and possible destruction of these nationally important striped bass and shortnose sturgeon resources cannot be ruled out. A reliable mitigation plan to offset adverse impacts caused by changes in salinity and dissolved oxygen from the proposed or a lesser project alternative has not been developed. Consequently, DNR cannot support the proposed project schedule for a final EIS and a traditional WRDA 98

authorization in 1998. However, based on discussions with GPA, DNR would agree to support a "conditional project authorization" through the WRDA 98 planned project design phase outlined in correspondence from Charles E. Griffen dated 18 June 1998. The WRDA 98 authorization allows for the design phase to proceed to a conclusion meeting both GPA and resource agency common needs in full compliance with all Federal and state environmental laws and regulations. This approach would incorporate mutually agreed upon language included as an integral part of the authorization in WRDA 98. This will require further impact analyses, interpretation and investigation of alternative plans to be conducted in full coordination with the resource agencies along with development of an acceptable final mitigation plan complying with NEPA, and other Federal environmental laws, and with Georgia's Water Quality Standards in order for construction to go forward. DNR will support the feasibility report and EIS to allow the project to proceed to conditional project authorization in the WRDA 98 subject to additional evaluations, modifications and environmental compliance. To this end we are committed to working with you and the interagency team toward an acceptable resolution of remaining issues.

The public interest is served with harbor activities when those activities proceed in an environmentally sound manner. The Corps and Georgia Ports Authority have been instrumental in exploring and clarifying potential resource issues associated with this project. We appreciate the effort expended in working with the Department during this planning phase.

Sincerely,

Lonice Barrett
Commissioner

Harold F. Reheis
Director
Environmental Protection Division

cc: William Bailey, Corps of Engineers
Doug Marchand, Director, Georgia Ports Authority
Duane Harris, Director, Coastal Resources Division
David Waller, Director, Wildlife Resources Division
Dr. Stuart Stevens, Chief, Ecological Services
Carl Hall, Regional Supervisor, Fisheries

Letter response

Georgia Department of Natural Resources

205 Butler Street, S.E., Suite 1252
East Tower
Atlanta, Georgia 30334-4100

Date: July 1, 1998

1. COMMENT: The DEIS is incomplete in content, omits significant information that is needed to fully evaluate impacts, and does not adequately address potential adverse effects on nationally important fisheries and cultural resources and the additional loss of valuable tidal freshwater marsh on and around the Savannah National Wildlife Refuge. Predicted salinity increases and dissolved oxygen declines in portions of the Middle and Front Rivers, resulting from the proposed eight-foot channel deepening project will detract from and could likely preclude further efforts to restore striped bass and shortnose sturgeon populations in the lower Savannah River by reducing the small remaining amount of suitable habitat.

RESPONSE: See response to Comment #1 in NMFS letter dated June 12, 1998.

2. COMMENT: The draft document does not include a thorough discussion of mitigation options for striped bass or data requested on 20 January 1998 from recommended mitigation model runs to determine whether an eight-foot deepening project might preclude restoration of critical Back River striped bass spawning habitat to pre-tide gate condition (bathymetry). Restoration of striped bass spawning and nursery habitat to support a self-sustaining Savannah River striped bass population is a primary DNR goal. Mitigation model runs for Back River restoration need to be conducted prior to determination of the selected project alternative.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

3. COMMENT: The primary project mitigation measure, closure of Middle River, is a major modification of the Lower Savannah River and constitutes a potentially significant action that requires a thorough impact analysis. No model results are provided to evaluate the hydrodynamic impacts, and the feasibility of closing off Middle River has not been established. While this action would prevent salinity intrusion into the lower portion of Middle River, it would also increase salinity intrusion up Front River. Additional impacts to tidal freshwater marsh and tidal forested wetlands would be shifted from Middle River to Front River. Because the project would increase salinity in Front River above current conditions, it would likely render a substantial area upriver of Talmadge Bridge unsuitable

for striped bass egg and larval development and survival following spawning and potentially impact spawning and juvenile nursery areas upstream of U.S. Highway 17 bridge during low flow periods. Middle River closure could also cause adverse changes in water level, sedimentation rate, current velocity, fish and wildlife movement in Back River and Middle River and water quality at the City of Savannah's raw water intake at Abercorn Creek.

RESPONSE: See Response to Comment #10 USFWS letter dated June 22, 1998.

4. COMMENT: Dissolved oxygen within the harbor channel is frequently lower than the level needed to support a healthy aquatic community. The proposed project will further depress existing low dissolved oxygen levels and as stated in the DEIS "post-project conditions in the KITB wilt exceed the environmental tolerances of juvenile shortnose sturgeon" which have traditionally used KITB as a nursery and foraging area. Proposed deepening of the Port Wentworth TB to provide an alternative juvenile shortnose sturgeon habitat (to replace impacted habitat in KITB) appears premature given the inadequate availability of basic life history, behavior and distribution data available for the species following termination of Back River tide gate operation in 1992 and the completion of the previous channel deepening project in 1994. However, the three-year study proposed in the DEIS is a positive measure for filling in critical information gaps, and should be coordinated with South Carolina DNR (Collins et al.) and conducted prior to any deepening of PWTB.

RESPONSE: No response necessary.

5. COMMENT: It is our understanding that pre-project baseline salinity incursions up the Front and Middle Rivers have been found to be substantially greater than predicted in association with the previous channel deepening project and could negate the suitability of the PWTB as a replacement for KITB as a juvenile sturgeon refuge.

RESPONSE: The projected "net" impact of the last deepening was not underpredicted based upon evaluation of measured salinities before and after the last deepening. Although the model was able to project the "net" impacts, the model underpredicted the absolute salinity levels along the Front River following the deepening and the decommissioning of the tide gate. This is primarily due to a lack of continuous data used in the model calibration, and the fact that the spring/neap variation along the Front River (following decommissioning of the tide gate) was not well understood The analyses conducted for this EIS are based upon adequate data sets which measured the continuous salinity throughout the system at the bottom and surface. The studies conducted consider all of the important physical processes which will affect salinity and the changes due to deepening. In the CED phase any the suitability of the PWTB as Shortnose Sturgeon habitat will be fully evaluated using appropriate tools. The results of this work will be presented in the Tier II EIS.

6. COMMENT: The lower Savannah River contains extensive but declining acreage of tidal freshwater marsh that is confined largely to the SNWR. Tidal freshwater marsh supports an extremely diverse plant community providing food, cover and nesting habitat for a variety of fish and wildlife species. Tidal freshwater marsh is unique and relatively scarce in comparison to salt marshes. Because of its scarcity and its high fish and wildlife value, resource agency goals have been to restore and maintain tidal freshwater marsh in the lower Savannah River. These tidal wetlands have undergone significant adverse modification and loss due to previous Savannah Harbor navigation project improvements, and, despite recent and highly responsible efforts to reverse negative trends, they remain highly vulnerable to incremental and cumulative salinity changes.

RESPONSE: We concur that the tidal freshwater marshes are a valuable wetland resource.

7. COMMENT: The proposed plan for Harbor expansion suggests installation of sheet piles to protect Old Fort Jackson. Departmental experts reviewed the plan and visited Old Fort Jackson. Because there are numerous unknowns associated with the expansion project, I do not believe the proposed measures will adequately protect the Fort. Therefore, the sheet pile wall designated as "additional" in the information provided by the Georgia Ports Authority should be made part of the sheet pile wall included in the project.

RESPONSE: The proposed project was revised in the final study documents to include sheet pile protection of the entire length of the fort structure along the river shoreline.

8. COMMENT: Placement of beach quality sand into areas outside of the sand sharing system is a loss of a valuable natural resource. Tybee Island is experiencing erosion. As it is becoming more and more recognized, the Savannah Harbor impacts Tybee's beaches. Beach quality sand should be considered for placement along Tybee Island. Although little data exist on the likelihood of beach quality sand from the Project, if more sand is found from additional corings, then procedures should be implemented which consider placement of that sand onto Tybee's beaches.

RESPONSE: The potential beneficial use of channel sediments was evaluated. Based on information available at this time, the sediments do not appear suitable for placement in either the nearshore or directly on the beach. When additional geotechnical information becomes available during the CED phase, this determination will be reevaluated. Should sufficient volumes of suitable sediments be found that could be feasibly excavated and used in one of those beneficial manners, it would be pursued if found to be economically warranted.

9. COMMENT: The Savannah Harbor Expansion project should be coordinated with the authorized Island-wide beach renourishment project planned for Tybee Island. Beach quality sand should not be placed on islands outside of the influence of the Harbor and, therefore, DNR requests you remove any reference within the EIS to placement of sand on Daufuski Island, SC.

RESPONSE: The EIS should consider all possible beneficial uses of the dredged material. The LTMS identifies placement of dredged material on both the Tybee Island beach and the Daufuskie Island beach as beneficial use alternatives. Hence, both alternatives are considered in the EIS. Since Tybee Island is closer to the bar channel, placement of dredged material on the Tybee Island beach would be the lower cost alternative. Therefore, the Tybee Island beach placement would be the preferred alternative.

10. COMMENT: The DEIS document only addresses the maximum eight-foot deepening option and does not include analyses of incremental deepening options, even though engineering and economic analyses were performed at two-foot intervals. This lack of incremental model predictions on salinity and dissolved oxygen impacts does not allow an informed alternatives analysis to be conducted on the project.

RESPONSE: The proposed scope of the DEIS was stated as a "worst case scenario" addressing the potential impacts of the deepest alternative, a 50 foot channel. All other alternative project depths would have less impact. Additional studies will be performed in the CED phase to evaluate alternative depths.

11. COMMENT: The DEIS implies that water quality impacts of deepening are linear, but there is no data to support that assumption.

RESPONSE: As part of the EIS development data of salinity changes through the last deepening were compared to changes projected under this deepening. The data indicate that an assumption of a linear relationship between deepening and salinity changes is not unreasonable. In addition, during the CED phase alternative depth scenarios will be run.

12. COMMENT: The potential effects on the lower Savannah River ecology, sand sharing system, historic resources, water quality, and striped bass and shortnose sturgeon populations from the most extensive harbor deepening project proposed to date are among the highest priority issues presently under consideration by DNR. As such, it is imperative that efforts to expand and deepen the Savannah Harbor must proceed with great caution and deliberation. Understanding the importance of this project to GPA and the economy of Georgia by maintaining a competitive Port of Savannah, we have an obligation to the people of Georgia, our recreational users and our environmental constituents to insure no significant environmental impacts occur as a result of this proposed harbor improvement plan. Based on this, we must advise that the project and proposed mitigation, as presented in the DEIS, are environmentally unacceptable at this point and that additional information and design features are needed before DNR can support a determination that the associated

environmental consequences of the selected alternative are not significant. The degree of impact on nationally important public trust resources, the proper calibration of lower Savannah ecosystem models, and the perceived inadequacy of the proposed mitigation plan for the single project alternative discussed must be addressed.

RESPONSE: See Response to Comment #10 in USFWS letter dated June 22, 1998.

13. COMMENT: The Director of GADNR-EPD is authorized to issue Section 401 certifications in the State of Georgia. EPD must advise you that a Section 401 certification cannot be issued until the following water quality standard issues are resolved:

1. The project as proposed will lower the dissolved oxygen concentration in the Savannah River. These concentrations are already at critical levels. This proposed reduction must be acceptably mitigated or eliminated.
2. The project could increase the salinity of the water of Abercorn Creek, an important source of individual and domestic water supply for the City of Savannah. The project must not adversely affect the users of the city's water system. The applicant must show that there will be no adverse impact, or must develop an acceptable mitigation plan.

RESPONSE: No response necessary.

14. COMMENT: GPA has put forth a good effort to identify and address the project's environmental impacts under its self-imposed "fast-track" schedule. The modeling effort by GPA and ATM has been very helpful in identification of information gaps and deficiencies that must be addressed to more completely address project impacts and form a sound basis for mitigation planning. Interagency discussions of the Technical Advisory Group and Resource Agency Group which occurred at each phase of the modeling study were extremely beneficial in developing agreement on the uncertainties that must be addressed.

RESPONSE: No response necessary.

15. COMMENT: Much work remains to be done, and additional fishery resource information specific to the Savannah River System is needed. The possibility that harbor deepening, as planned, will result in substantial adverse impacts and possible destruction of these nationally important striped bass and shortnose sturgeon resources cannot be ruled out. A reliable mitigation plan to offset adverse impacts caused by changes in salinity and dissolved oxygen from the proposed or a lesser project alternative has not been developed. Consequently, DNR cannot support the proposed project schedule for a final EIS and a traditional WRDA 98 authorization in 1998. However, based on discussions with GPA, DNR would agree to support a "conditional project authorization" through the WRDA 98 planned project design phase outlined in correspondence from Charles E. Griffen dated 18 June 1998. The WRDA 98 authorization allows for the design phase to proceed to a conclusion meeting both GPA and resource agency common needs in full compliance with all Federal and state environmental laws and regulations. This approach would incorporate mutually agreed

upon language included as an integral part of the authorization in WRDA 98. This will require further impact analyses, interpretation and investigation of alternative plans to be conducted in full coordination with the resource agencies along with development of an acceptable final mitigation plan complying with NEPA, and other Federal environmental laws, and with Georgia's Water Quality Standards in order for construction to go forward. DNR will support the feasibility report and EIS to allow the project to proceed to conditional project authorization in the WRDA 98 subject to additional evaluations, modifications and environmental compliance. To this end we are committed to working with you and the interagency team toward an acceptable resolution of remaining issues.

RESPONSE: GPA is committed to performing additional evaluations to be included in the Tier II EIS that will render the proposed project fully compliant with all Federal, State and local environmental regulations.

Georgia
Coastal Resources Division

June 23, 1998

Mr. William G. Bailey
US Army Corps of Engineers
P.O. Box 889
Savannah, Georgia 31402-0889

RE: Notice of Availability of Draft Feasibility Report and DEIS for Savannah Harbor Federal Navigation Project (Savannah Harbor Expansion), Chatham County, Georgia

Dear Mr. Bailey:

Staff of the Coastal Resources Division have reviewed the above referenced public notice and accompanying documents. The project proposes to deepen the inner harbor navigation channel to -50 feet along approximately 36 miles of the Savannah River.

A consistency determination prepared by a federal agency should be submitted to the State following development of sufficient information to determine reasonably the effects of the proposed project on natural resources of the coastal area. The Draft Environmental Impact Statement referenced above does not contain sufficient information to determine the consistency of the proposed project from planning to completion. In cases where major federal decisions are phased based upon developing information and subject to federal agency discretion to implement alternative decisions based upon such information, a consistency determination is required for each major decision (e.g. planning, siting, design decisions) (refer to 15 CFR 930.37(c)).

The Coastal Resources Division, therefore, reserves the right to request Federal Consistency Determination(s) on this project as more information is provided on reasonably likely effects to natural resources in the Final Environmental Impact Statement. The Division will, at that time, determine if this project constitutes phased
decision making subject to multiple consistency determinations. Please feel free to contact me or Kelie Cochran if we can be of any assistance.

Sincerely,

Dr. Stuart A. Stevens

Chief, Ecological Services Section

cc: Mr. Lonice C. Barrett, DNR Commissioner
Mr. Duane Harris, DNR/CRD Director

Georgia Department of Natural Resources
Coastal Resources Division
One Conservation Way
Brunswick, GA 31520-8687
(912) 264-7218
FAX: (912) 262-3143

Letter response

Georgia Department of Natural Resources
Coastal Resources Division
One Conservation Way
Brunswick, GA 31520-8687

Date: June 23, 1998

COMMENT: A consistency determination prepared by a federal agency should be submitted to the State following development of sufficient information to determine reasonably the effects of the proposed project on natural resources of the coastal area. The DEIS referenced above does not contain sufficient information to determine the consistency of the proposed project from planning to completion. In cases where major federal decisions are phased based upon developing information and subject to federal agency discretion to implement alternative decisions based upon such information, a consistency determination is required for each major decision (e.g. planning, siting, design decisions) (refer to 15 CFR 930.37(c)). The Coastal Resources Division, therefore, reserves the right to request Federal Consistency Determination(s) on this project as more information is provided on reasonably likely effects to natural resources in the FEIS. The Division will, at that time, determine if this project constitutes phased decision making subject to multiple consistency determinations.

RESPONSE: The Tier II EIS will contain a Consistency Determination and that document will be provided to GADNR-CRD for review. GPA will address any concerns expressed by the GADNR-CRD at that time.

Department of Transportation

State of Georgia
#2 Capitol Square, S.W.
Atlanta, Georgia 30334-1002

June 15,1998

Colonel Grant Smith
US Army Corps of Engineers PO Box 889
Savannah, Ga 31402

Dear Colonel Smith-.

The attached comments are in reference to the Draft Feasibility Study and Appendices for the Savannah Harbor Expansion Study. We understand your tour of duty in Savannah will soon be complete and your successor during the comment period for this study. We wish you every success in your new assignments and hope the transition will not present any confusion in responding to our comments.

If you have any questions concerning any of the attached comments, please call John Phillips at 404-651-9213.

Sincerely,

Luke Cousins, Adminisrator
Office of Intermodal Programs

DOT COMMENTS FOR SAVANNAH HARBOR DEEPENING STUDY
APRIL 1998

General Comments:

1. The voluminous study does not conclude in a finite plan for the Savannah Harbor. The alternatives are evaluated, a "NED (National Economic Development) plan" is identified as deepening to 47' MLW and a "Locally Preferred Plan" is identified as a 50' project and is also identified as the "Tentatively Recommended Plan" but, a final decision is never identified. Past Corps documents clearly identified the final plan proposed for review. Assumptions have been made in this study without the benefit of a ship simulator study which conflict with results of the ship simulator study completed for the previous deepening project.

2. The page number system used has no order. It is extremely confusing. The page numbers should be consecutive from beginning to end of each book.

3. The tables referenced in the text do not always correspond to the titles of the tables shown. The reader has to assume which table to view.

4. The term "Expansion Study" is a misnomer. This is a deepening study. Historic documents distributed by the Corps in 1987 define an "expansion" as expanding the existing harbor to the Mulberry Grove area. Why is the term "expansion" used in the subject study synonymously with "deepening"?

5. The issue of local sponsorship for the Savannah Harbor is not addressed adequately. The study states that GPA will be sponsor in accordance with section 204 of WRDA86 (Water Resources Development Act of 1986). Normally the Corps studies spell out all the responsibilities of the sponsor. It is insinuated that Chatham County will be sponsor for subsequent maintenance of the harbor. Meetings have been held by the Corps, GPA, Chatham County, DOT and others to discuss this important subject on August 26,1997, October 28,1997 and April 28,1998. Chatham County has gone on record as stating they no longer wish to voluntarily serve as sponsor for the Savannah Harbor. The Corps has provided copies of draft PCA's and PGL47 from Washington for information. The issue of local sponsorship for Savannah Harbor needs to be clearly defined and one party identified as sponsor for the entire harbor. The Corps should be encouraging the presence of one sponsor versus several. The upcoming deepening project is the perfect opportunity to complete this matter. The statements in the study claiming that Chatham County is sponsor for the current navigation channel are false. Chatham County signed a resolution to be sponsor for the 38 ft deepening in 1967 and the tide gate project.

   Those resolutions were for specific projects only; not agreements to provide disposal areas for the harbor indefinitely regardless of the project depth.

Chatham County has acted as sponsor for the harbor recently on a voluntary basis, not a legal basis. Please see attached document prepared by this office. GPA should be identified as the current sponsor since the last deepening.

6. The statements in the study indicating that the study has been conducted with close coordination with numerous agencies is false in the case of Chatham County and the Georgia Department of Transportation (DOT). We have not been invited to participate in any meetings or efforts for the study. A meeting was held on May 15,1997; the agenda included an afternoon session to discuss the Deepening project, but the afternoon session was canceled by GPA. The Public Scoping Meeting held on July 9, 1997 has been our only opportunity to participate in the process. Chatham County sent a representative. All of our verbal and written requests to be included in the process and our requests for interim reports have not been responded to. We have unofficially and informally provided our plans for raising dikes and other works for the disposal areas while the Corps and Georgia Ports Authority (GPA) have attempted to bilaterally plan the use of the disposal areas for the Deepening Project between the dike construction periods. The logic of using the areas during the planned drying periods is not based on a working knowledge of the planned management of the disposal areas according to the LTMS (Long Term Management Strategy Study). We are disappointed that our participation was not requested for this important project. DOT has funded $96,342,492 for the Savannah Harbor disposal areas since 1973; DOT owns and pays taxes on 4660 acres of the total 5999 acres in the disposal areas and, we regard <u>all</u> parties as <u>equal</u> partners in the management of the disposal areas.

Feasibility Report

7. Introduction. Page 2. Sect 2.1.c. Why is the Corps allowed 180 days to review their own study while those who have never seen it only get 45 days?

8. Introduction. Page 12. Sect 2.9.3. The resolutions passed by Chatham County were for the specific projects to deepen to 38' and the tide gates only. The statement in the study is not complete. It should state that Chatham County is presently acting voluntarily in the role as sponsor and there is no legal obligation for them to do so.

9. Baseline Conditions. Page 8. Sect 3.1.6. The use of the areas has not been officially coordinated with Chatham County or DOT. It is possible that the LTMS will be fully implemented by July 1999 and the use of adjacent areas will not be possible due to the management of the areas as outlined in the LTMS.

10. Problem Identification. Page 4. Sect 4.3.1. a)Does federal policy require disposal capacity for 50 years or 20 years? The areas may be too high and small to feasibly dredge into them before the 50 year period ends. A quick analysis of

area 12B indicates that in 50 years (if the dredging / dike raising schedule continues as it has) the dikes will be at elevation 117 ft MLW and the size of the area will be reduced from the current 703 acres to 320 acres due to stepping in with each subsequent raising. b)Will the dredge be capable to pump this high ? c)Has the cost of a booster pump (if needed to pump this high) been included in the maintenance dredging costs over the 50 year period? d)At what point is the size of the area too small to dredge into?

11. Section 5.1.5. Page 5. How much of 2A will be lost?

12. Section 5.4.8. Page 36. The analysis to determine whether or not to construct a new area only looks at initial construction of the deepening project. The maintenance of the channel after construction should be analyzed as referenced in section 4.3. 1. To pump to area 12A for 50 years will cost $201,500,000 versus the dike costs to join 1N and 1S of $3,800,000. It is surprising that the Corps would not be encouraging the referenced dike construction given the magnitude of difference in costs. Areas 1N and 1S should be combined during the deepening project to reduce subsequent maintenance dredging costs. To hydraulically construct the area during the deepening construction, the costs would be greatly reduced by including it in the dredging contract and the sponsor (GPA) would be eligible to have the costs shared by the federal government.

13. Section 5.4.6. Page 35. If the existing channel is 42 ft and you deepen 6 ft, how do you arrive at 50 feet? It is not appropriate to add the 2' allowable overdepth since it is not guaranteed to be dredged. By definition, allowable overdepth is a pay section below the required depth allowed to the dredging contractor due to inaccuracies in finely controlling the cutterhead. Also any advance maintenance currently existing is suppose to be preserved after the deepening (as stated in the study) and should not be included as the project depth.

14. Section 5.4.9. Page 38. The location of final disposal site should be stated here instead of requiring the reader to completely read the document.

15. Section 5.4.13. 1. Page 39. Why wasn't Chatham County and DOT allowed to review the Draft EIS when it was apparently distributed earlier?

16. Section 5.4. 13.3. Page 4 1. When will the mitigation for the previous deepening project to 42 ft be completed? DOT agreed to give 25 acres on Jones Island to GPA for mitigation of wetlands during the 42 ft deepening as long as GPA completed the legislative actions necessary to complete the transfer. To date this has not been completed.

17. Section 6.2. Dredging Non-Federal Berth. Page 3. Have all the berth owners been afforded an opportunity to have their berths dredged during the deepening project?

18. Table 6-5. Page 12 (one of several). a)Who will pay for the differential additional maintenance dredging costs each year? b)Who will pay to maintain the water intake structure?

19. Section 6.8. Page 13. Will GPA be the sponsor after construction and responsible for providing disposal areas for maintenance of the project?

20. Section 7. Page 1. Why is the term "tentative" used? A study of this magnitude should have a definite plan.

21. Section 7.1.2. Page 5. There will probably be a shift in the locations of shoals for maintenance as there was following the last deepening. The frequency of raising dikes at area 2A including numerous small dike raisings has greatly increased following the last deepening. Our records indicate that between 1980 and 1993, the Corps placed an average of 418,113 cubic yards (exclusive of Widening Project) per year into area 2A; after the 42 ft deepening, from 1993 to 1997, the Corps has placed an average of 887,373 cubic yards (exclusive of recent 2.1 million advance maintenance cubic yards) per year into area 2A. We have used numbers provided by the Corps to compute the averages. This is a clear increase in use of 2A which we attribute to redistribution of shoals in the harbor as a result of the last deepening project. Based on our actual observations, not theoretical hypothesis, we anticipate the proposed deepening to 50 *ft* will relocate additional shoals upstream, thus increasing the dredging and disposal costs. What data was used to make the determinations of no increase in maintenance dredging costs?

22. Section 7.3.4. Page 12. When the plug at New Cut is reopened, will Chatham County be relieved of maintenance responsibilities for the plug as defined in the PCA (Project Cooperation Agreement) dated January 13, 1992?

23. Section 7.3.5. Page 14. The bass window lower limit has been changed to station 53+250.

24. Table 7-6. Page 16. The costs may change following completion of the ship simulator study.

25. Section 7. Page 23. Figure 7-5 is missing.

26. Section 8.3. Page I 1. a)Can it be plainly stated if GPA as sponsor under Section 204 is responsible to provide disposal areas for subsequent maintenance of the project? b)If not, will a separate agreement be developed to define who is responsible for continued maintenance of the harbor? Chatham County has gone on record as stating they no longer wish to act as sponsor for the Savannah Harbor.

27. Section 9. 1. 1. Page 1. Why wasn't Chatham County and DOT considered to have a vital role in the feasibility study?

28. Section 9.1.3. Page 1. Why wasn't Chatham County and DOT considered to be an "involved group"?

29. Section 9.1.4. Why wasn't Chatham County and DOT considered to have an interest in Savannah Harbor?

30. Section 9.1.7. Page 3. Why wasn't DOT invited to the November 1997 meeting? DOT owns 75% of the disposal areas as well as the old radio antennae site on Hutchinson Island. Chatham County owns several fee parcels and easements on Hutchinson Island resulting from the Widening project in 1990.

31. Section I 0. Page 2. Why aren't the responsibilities of the sponsor listed in detail as they have been in all other Corps Feasibility Studies?

32. Acronyms. a). LERR stands for Lands, Easements, Rights-of-Way, and Relocation. If disposal areas are to be included, the proper acronym is LERRD. b). The "T" in TEU stands for "Twenty-foot", not "Ton".

Real Estate Appendix

33. The section numbers do not correspond with the paragraph numbers in the text.

34. Section 2, page 1 states navigational servitude will not be invoked, yet section 3.2, page 1, describes the action of navigation servitude being invoked towards TIC (The Industrial Company) bulkhead. Based on our experience about navigational servitude during the Channel Widening Project of 1990, it is our opinion that removal of the TIC bulkhead would be through navigational Servitude. Why does the study not identify the removal of the bulkhead as a navigational servitude action?

35. Section 6. Page 1. a)Since improvements (wideners) outside the North toe of the navigation channel below Fig Island are in the State of South Carolina, are mineral leases required from that state? b) Does Widening towards the South Carolina side of the state line (station 55+000 to 52+500 and others) violate the language in the Federal Appropriations Bill which prohibits the Corps from taking lands in Jasper County, South Carolina?

36. Section 9. Page 1. Would the property owners more likely accept the project if their lands were purchased fee simple rather than buying an easement? The owner of property burdened with an easement is still required to pay taxes on the land which they have little, if any, ability to develop. The cost of an easement is nearly the cost of fee acquisition anyway.

37. The extension of the bar channel 25,000 feet is beyond the jurisdiction of the State of Georgia waters. a)Who owns and/or has jurisdiction concerning the

real estate under the ocean in this area? b) What agency governs the activities in this area?

Engineering Appendix

38. Section 4.3. Page 4. See our comment #23.

39. Section 4.3. Page 5. Last paragraph. Chatham County is voluntarily acting as sponsor and is not legally responsible for dike construction.

40. Section 5.4. 1. Page 7. What determines the final channel alignment, the ship simulator study or one actual transit by the people identified in the text? If the simulator study differs from the assumptions made during the transit, the cost estimates will be affected.

41. 1. Section 5.4. 1. Page 7. The paragraph discussing the dikes at 2A seems to contradict the text in 5.4.4.3. It is first stated that " The Kings Island turning basin was also widened 76 feet. This is the maximum possible enlargement which can be accomplished without impacting the dikes in disposal area 2A." In section 5.4.4.3 on page 12 it is stated "... will require the relocation of approximately 1100 feet of disposal area 2A dike... ". Which scenario is being planned?

42. Section 5.4.2. Page 8. a) Where is Table 3? Assuming Table 5-1 is the table to find the bottom channel width with advanced maintenance, the mathematics needs checking. As stated in the text, a 50' channel will be 48 ft narrower than the existing channel but, the table indicates that 500ft - 48 ft = 464 ft instead of 452 ft. b)How does the advance maintenance influence the bottom width? Also, Table 5-1 indicates the channel is 500 feet wide at station 100+000. The widening project in 1990 ended at station
97+750. c)When was the reach from 97+750 to I 00+000 widened from 400 ft to 500 ft?

43. Table 5-1. The new channel widths are less than 500 ft in the inner channel. This conflicts with the feasibility study that justified the Widening Project of 1990. a)What has happened since the critical need to widen the river in 1990? b) Does this violate the federally authorized channel width of 500 ft?

44. Section 5.4.4.3. Page 12. Since Chatham County and DOT have not been invited to participate In the decision for need and design for relocating the dike at area 2A , we will not accept any immediate or long term responsibility for any failures or any liabilities associated with this action. It is disappointing to the parties that have managed the disposal areas for the past 20 years to learn of proposed dike relocations during the course of reviewing this feasibility study.

45. Section 6. Page 2 is blank.

46. Section 6.3. Page 7. During the study phase of the 42 ft deepening project, the ship simulator study required the channel be widened toward the North toe from station 51+000 to station 40+500. That decision was made for a smaller ship than the current design vessel. Cultural resource studies were completed, a training wall was removed, and wetlands were mitigated, all at a considerable expense. Now, without the benefit of a ship simulator study for a larger ship, the decision has been made to widen towards the inside of the curve. It appears this decision is made simply to avoid the buried gas lines and thus save construction money and has little to do with the movement of ships. Since part of Elba Island is for sale, why not buy it and relocate the channel to remove the sharp curve in the river?

47. Section 6.4. 1. Page 10. In addition to our comment #21, it also appears that plugging Middle River and opening New Cut, and the plugs around Hog Marsh Island will have a hydraulic effect on the shoaling patterns of the harbor. It will be interesting to see the results of the sedimentation model when it is available. This is our request for a copy of the sedimentation study when it is completed.

48. Section 6.5. Page 11. The landing between 12A and 12B is designated as a debris off loading ramp. This is part of the former Simpson and Thomas property purchased because the Corps easement was being questioned. Does the Corps easement on this property allow for this type of work?

49. Section 7. Page 1. Since this plan does not supersede the LTMS, how can areas 12A, 12B, and 13A be dredged into within months apart and the areas be rotated for drying and bird management?

50. Section 7.1.1.7. Page 3. Have the surveys been verified? Our use of the topo produced by the Corps consultant indicated the front dike of area 13A was apparently not adjusted from MSL to MLW datum.

51. Table 7- 1. Page 4. How is the minimum elevation of 30' MLW at area 12A determined from the referenced topo?

52. Section 7.1.3.3. Page 7. The use of the sites was not officially coordinated with the existing project local sponsor. We faxed a hand written list of plans for dike raising and other work for the disposal areas to the Corps. This was the extent of the coordination. When we asked for information, the Corps replied that they were under strict instructions to not discuss the deepening project's planned use of the areas. Only through covert conversations did we have any knowledge of the deepening project's plans.

53. Section 7.1.3.3. Page 7. See our comment # 12.

54. Section 7.1.4.3. Page 17. We will not accept any liability or responsibility for

any failures associated with the design and construction of the berms parallel to the front dikes to encourage the mounding of sand dredged during the deepening project.

55. Section 7.1.5. 1. Page 19. The schedule of work has changed.

56. Sections 6.7 and others. The table #s in the text do not correspond to the table titles.

57. Section 7.1.7.2. Page 26. Will the dike raisings needed for the deepening project invoke WRDA96 where the Corps shares the cost and GPA will be sponsor for these areas? Again, the issue of local sponsor needs to be seriously addressed in this project.

58. Section 7.1.7.6. Page 28. We normally construct a 16 ft to 20 ft dike width rather than 12 ft.

59. Section 7.2. 1. Page 29. Who does the Corps expect to provide disposal capacity after the deepening project?

60. Section 7.2.2.4. Page 35. The Sediment Basin was not deepened during the last project and has collected smaller quantities of sediment than it used to prior to the plugging of New Cut and ceasing use of the tide gate structure. It has been stated that the basin should still function, only not as efficiently. In order for a "trap" to operate, it should have a lower floor elevation than the nearby channel. This is the reason given for the original construction of the sediment basin and why the Kings Island Turning Basin collects so much sediment.
a)Why was it decided to not deepen the sediment basin to
elevation 54 ft MLW (50' channel plus 2' advance maintenance plus 2' to trap sediment) ? b) What fundamental engineering principles have changed since the construction of the sediment basin?

61 Section 7.2.3. 1. Page 3 8. See our comment # 10.

62. Table 7-30. Page 40. We disagree with the dike raising frequency shown. The dikes will require raising more often than shown.

63. Section 7.2.3.3.3 and 7.2.3.3.4 on page 42. The figure numbers referenced in the text do not correspond with the figures in the back.

64. Section 8.3. 1. Page 2. In 1987, the "Jim Bean", a 30 inch dredge, pumped sand from area 2A to 12A without any boosters. Are you sure you need 2 boosters during this project?

65. Section 8.3.5. Page 2. Why isn't the bass fish window mentioned in this section?

66. Section I 1. Page 1. It is stated that costs for dike improvements will be cost

shared in accordance with reference 2.8. Reference 2.8 is "Local Cooperative Agreements for New Start Construction Projects". Elsewhere in the report it is stated this project will be conducted through section 204 of WRDA86. It is our understanding that these processes are different. Please explain how this project will be conducted and how the issue of local sponsor will be resolved.

67. Section 12. Page 1. a) Why place 800,000 cubic yards in 2A, then remove 1,050,000 cubic yards? It would create more capacity in 2A if the 800,000 cy removed from New Cut plug were placed in IS and then remove 1,050,000 cy from 2A. This would increase the life of 2A by another year. It would also provide fill at 1S for construction of dikes when 1N and 1S are joined. b) Will the 1,050,000 cy be removed with land based equipment or a hydraulic dredge?

68. Section 13. 1. Page 1. Again, we will not accept any responsibility for the dike design and construction since we have not been invited to participate in the decisions thus far. When will Chatham County no longer be recognized as acting sponsor for the Savannah Harbor?

69. Section 14. Page 1. Please identify the agency referred to by the term "local sponsor" in this text.

70. Section 15. Page 1. Chatham County has recently conducted numerous subsurface investigations in the disposal areas. These are available to the Corps. This may provide a cost savings in the project.

71. Figure 7 & 8. Has the widening toward Hutchinson Island been analyzed for possible impacts to the construction of the trade center and hotel?

72. Figure 9 & 11. The state line is in the wrong location.

73. Figure 2 through 33. The conventional engineering drawings for construction use dashed lines to indicate existing structures and solid lines to indicate the proposed construction. Why are the Corps drawings obviously reversing the traditional method of drawing?

74. Figure 20 through 33. Why is the bar channel narrowed to less than 600 feet? There are no real estate concerns as with the inner harbor. Also, the extension from -60+000 to -85+000 is shown as narrowing an existing channel, but there is no existing channel to narrow. Why?

75. Figure 34 and others. a) The typical sections do not use conventional engineering practices to list the station numbers applied to the sections. For example, by listing station numbers, you orient the perspective view; from station 102+000 to 98+750, KITB is on your left, not your right. Some contractors could legally dredge into the GPA docks as the sections are currently shown. b) There are some missing sections, i.e., what section applies to stations 98+750 to 97+750, from 89+500 to 89+000 and others? There are two

sections shown for station 91+600 to 90+750, which applies? c)Were quantities for cost estimates based on these drawings?

76. Figure 64. The hatched area labeled "New Work Allowable Overdepth 2.0"' could be legitimately dredged. It is assumable that the material up the slope could slough in. Has stability analysis been completed with this possibility accounted for?

Economics Appendix

77. Section 2.4. 1. page 3. What is the maximum depth the Savannah Harbor can be dredged to? While ships continue to grow in size, the harbor has physical limitations due to real estate, development, and environmental factors. If this deepening project ($195 million) only lasts 4 years as the last deepening project ($50 million) did, and the next deepening ($?) only lasts 4 years because of larger ships, are the investments feasible?

78. Section 5.3.2. Page 12. Since the cost of using the mini-bridge from Los Angeles is essentially equivalent in cost per container to using Savannah Harbor, why not use the mini-bridge and save $195 million? This deepening project appears to only benefit the container traffic.

79. Section 6.3.3. Page I 1. If the annual increase in cost due to unidirectional ship traffic flow is only $200 for the proposed 50 ft channel, how was the widening in 1990 justified? Have the ships grown in size to the extent that the number of transits has been cut in half?

EIS

80. Section 2.4. Page 3. See our comment # 6.

81. Section 2.4. 1. Page 4. Is the term "decommissioned" the same as "deauthorized by Congress" ? When will Chatham County no longer be recognized as local sponsor for the fresh water canals, and New Cut? Also, when will the property adjacent to the tide gates be returned to Chatham County ?

82. Section 3.5. 1. Page 7, and Section 4.4.2. page 32. See our comment # *5*.

83. Section 5.4.2. Page 3 1. Has the increase in operational and maintenance costs for water users been included in the B/C analysis?

84. Section 5.7. 1. page 53 & 54. See our comment # 16. Also, our addition of the listed impacted acreage total 62.71 acres instead of 40.21 acres. We included: 5.16 ac (bend wideners) + 0.05 ac (debris ramp) + 3.0 ac (filling oxbows at Steamboat Cut) + 7.5 ac (river bottom at Steamboat Cut) + 2.0 ac (river bank near plugs at confluence of Middle and Front Rivers) + 10 ac (GPA marsh creation) + 15 ac (river bottom for plug Middle River) + 20 ac(remove plug at New Cut) = 62.71 acres. Please identify where we made an error.

85. Section 5.7. 1. Page 53. As stated, marsh was created to mitigate wetland impacts from the previous deepening project. The current mitigation plan proposes to impact those same wetlands. Will the 10 acres created as mitigation for the previous deepening project need to be replaced once or twice?

86. Section 5.7.2. Page 54. It is stated that the plugged Steamboat River oxbow will yield wetlands to mitigate the 40.21 acres. How many acres are included in the proposed oxbow lake?

87. Section 5.7.3. Page 57. a)Are the required 12,000 acres for tidal freshwater marsh habitat mitigation included in the 2,925 acres proposed for incorporation into SNWR? b)Is this the proposed land shown in Figure 4-18? The text never references Figure 4-18. c) Is the land in Fig 4-18 within the confines of Mulberry Grove? d)Whatever happened to the idea of

swapping Mulberry Grove for lands owned by SNWR at areas 1N and 1S so a larger upstream disposal area could be constructed?

88. Section 5.8.3.3.2. Page 66 through 68. Each paragraph begins with a sentence "sta x to sta y, left bank, bottom width of Z feet". What is meant by the term " bottom width of feet"?

89. Section 7. The first sentence is inaccurate. See our comment # 6.

90. Section 7.3.3. Page 7. We look forward to a response to each of our comments.

Attachments

9 1. Section 8.1.1.2 Page B-26. The underdrains will drain to the Savannah River, not the Wright River.

92. Section 8.6. Page B-29. See our comment # 23.

93. Management of the ODMDS. Page C-3. Who from Chatham County participated in establishing an interagency Site Management Plan for the ODMDS?

94. Hazards to Fishing, Page C-9. It may be necessary to publish notices to fishing vessels concerning the 25,000 foot bar channel extension. We do not want to repeat the situation created at Wanchese Harbor near Oregon Inlet, NC where fishing boats were colliding with ships.

95. Advance Maintenance. Page E-2. Kings Island Turning Basin has 8 ft of advance maintenance instead of 6 ft.

96. Erosion and Sedimentation. Page E-24. This section appears to be the only opportunity (other than 5.4.3 of Engineering Appendix, which does not address our concerns either) to address erosion of the streambank, even though the text focuses on non-related land disturbing activities. The federal navigation channel is the reason large ships utilize the harbor. The large ships generate damaging transverse bow waves that erode the banks on both sides of the river. Deeper channels invite larger and faster ships, thus more erosive forces. Chatham County and DOT have completed a construction contract to protect the front dikes of some of the disposal areas from the erosion. The design of the revetment was based on observations and data collected subsequent to the 42 ft deepening project. We did not have knowledge in 1995 that a 50 ft deepening project was being addressed. A phased contract to protect the front dike of Jones Oysterbed Island will be signed this year. The Corps study should analyze the impacts the deepening project (resulting in larger, faster ships transiting the harbor) will have on the banks of the river.

97. Enclosure F. Appendix A Definitions. "Griffin" should be "Griffen".

98. Have all the MOAs been signed?

99. DOT is still reviewing the sediment quality report and will provide comments as soon as they are available.

End of DOT comments

BRIEF HISTORY OF SPONSORSHIP
IN SAVANNAH HARBOR

September 4,1997

The federal government requires some degree of participation from states or local organizations receiving federal financial aid. Projects for roads, transit agencies, public parks, dams, water reservoirs etc. using federal funds require a source of local funding to ease the federal burden.

Harbors are no different. The federal government will agree to pay for the dredging of waterways authorized by Congress as long as a "local sponsor" or "local assurer" will provide funds for certain aspects of the project. The federal government gives the sponsor the option to conduct the necessary work themselves or the sponsor can reimburse the Corps of Engineers for completing the needed work. The sponsor is responsible for the construction of the new harbor improvement and the maintenance of that improvement. All federal projects are physically defined in federal authorizations and funds are appropriated to construct within the limits of that project. It is sensible to assume that the sponsor for the subject project is only sponsor for that project and nothing beyond the limits of that project. Once a harbor improvement or any portion thereof is improved a second time, the prior sponsor is relieved for the section within the new limits and the new sponsor supersedes and is responsible for the new improvements and maintenance thereof Quite often the same party is sponsor for several improvement projects. No party is sponsor strictly for maintenance of the entire harbor. Sponsors have maintenance responsibility for the improvement projects they agree to be sponsor for. All maintenance responsibilities are tied to some capital improvement project. Given this basis, we contend there are three sponsors in Savannah. City of Savannah (station 112+500 to 105+000), Chatham County (station 105+000 to 103+000, sediment basin, some of the turning basins and the filling of New Cut) and Georgia Ports Authority (station 103+000 to 0+000, Kings Island Turning Basin, and the 11 mile bar channel).

The first federal appropriation for Savannah Harbor was in 1826 when the harbor was surveyed for wrecks and suitability for use as a Navy yard. This project along with federal projects in 1853, 1873, 1888, 1894, and 1907 did not require a local sponsor. In 1912 1913, 1916, 1927, 19'35, 1945, 1946, and 1954 the City of Savannah acted as local sponsor to the Corps. Over the course of these cumulative projects, City of Savannah was sponsor for the entire harbor at the time. (documentation available)

In 1967 Chatham County assumed the role of sponsor for the 38' deepening project (station 0+000 to station 105+000) and the tide gate project. The County simply passed resolutions agreeing to be the sponsor for these specific projects. The limits of the deepening ended at present river station 105+000. This left City of Savannah as sponsor only for the section from 112+500 to 105+000. Some people mistakably credit the resolutions to obligate the County to be responsible for the entire harbor for the rest of time. This is not true.

In 1972, the Georgia Department of Transportation (DOT) began assisting Chatham County in the funding of their responsibilities. In 1981, DOT became more active and began designing and letting dike construction projects. Since 1992, Chatham County has let the dike construction projects. A Memorandum of Understanding was signed by DOT and Chatham County in 1983 outlining the roles of each party.

In 1980, Chatham County assumed the role of local sponsor for construction of Kings Island Turning Basin. Rather than pass a resolution, the County signed a formal agreement to be local sponsor for this project. This added to the existing limits of Chatham County's responsibility since the fuming basin did not exist prior to construction.

In 1986 the County signed a Local Cooperation Agreement (LCA) to be local sponsor for the widening of the harbor between station 69+319 to 97+750. This superseded the obligations Chatham County had for this same reach as obligated during the 1967 deepening to 38'. Coincidentally, Chatham County was the same party in both cases.

In 1992 Chatham County signed a LCA to be local sponsor for the project to fill New Cut. This was new work and so physically expanded the County's responsibilities to include maintenance of the earthen plug. Due to the nature of the project, it unofficially deleted some of the county's responsibilities associated with the 1967 project for the tide gates, especially the aspects relating to the fresh water canals and the tide gate structure. The only item of the original 1967 tide gate project with Chatham County having any responsibility is maintenance of the sediment basin in front of the tide gates.

In 1993 Georgia Ports Authority (GPA) signed a LCA to be local sponsor for the 42 deepening project, including maintenance of the new channel which included Kings Island Turning Basin, the 11 mile bar channel and station 0+000 to station 103+000. This superseded Chatham County's responsibility for these areas and relieved them for these sections of the harbor.

Chatham County has voluntarily acted as local sponsor for the entire harbor since the completion of the Deepening Project even though there is no legal basis for them to do so. Based on a review of the legal documents, City of Savannah is sponsor between stations 112+500 to 105+000. Chatham County is sponsor for stations 105+000 to 103+000, the sediment basin in front of the tide gates, all the turning basins except Kings Island Turning Basin, and the earthen plug at New Cut. GPA is local sponsor for the remaining features of the harbor. (see exhibit 1)

The upcoming deepening project to 45' or 50' will require a local sponsor. This may be the time to obligate one party to be sponsor for the entire harbor. It is doubtful that City of Savannah will be a candidate. Whether the new sponsor will be GPA, DOT or Chatham

County is yet to be decided.

Prepared by the Office Of Intermodal Programs, DOT

Letter response

Department of Transportation

State of Georgia
#2 Capitol Square, S.W.
Atlanta, Georgia 30334-1002

June 15,1998

General Comments:

1. COMMENT: The voluminous study does not conclude in a finite plan for the Savannah Harbor. The alternatives are evaluated, a "NED (National Economic Development) plan" is identified as deepening to 47' MLW and a "Locally Preferred Plan" is identified as a 50' project and is also identified as the "Tentatively Recommended Plan" but, a final decision is never identified. Past Corps documents clearly identified the final plan proposed for review. Assumptions have been made in this study without the benefit of a ship simulator study which conflict with results of the ship simulator study completed for the previous deepening project.

RESPONSE: The Tier II EIS will contain a Consistency Determination and that document will be provided to GADNR-CRD for review. GPA will address any concerns expressed by the GADNR-CRD at that time..

2. COMMENT: The page number system used has no order. It is extremely confusing. The page numbers should be consecutive from beginning to end of each book.

RESPONSE: The FEIS will contain a Consistency Determination and that document will be provided to GADNR-CRD for review. GPA will address any concerns expressed by the GADNR-CRD at that time.

3. COMMENT: The tables referenced in the text do not always correspond to the titles of the tables shown. The reader has to assume which table to view.

RESPONSE: Concur. The Engineering Appendix has been revised to correct the discrepancies

4. COMMENT: The term "Expansion Study" is a misnomer. This is a deepening study. Historic documents distributed by the Corps in 1987 define an "expansion" as expanding the

existing harbor to the Mulberry Grove area. Why is the term "expansion" used in the subject study synonymously with "deepening"?

RESPONSE: The title of the study originates with the US Congress, who in 1984 authorized a study of the impacts of proposed upstream landside facilities in Savannah Harbor. The Corps' 1996 Reconnaissance Report stated that deepening the harbor appeared to be a feasible way to address those future needs.

5. COMMENT: The issue of local sponsorship for the Savannah Harbor is not addressed adequately. The study states that GPA will be sponsor in accordance with section 204 of WRDA86 (Water Resources Development Act of 1986). Normally the Corps studies spell out all the responsibilities of the sponsor. It is insinuated that Chatham County will be sponsor for subsequent maintenance of the harbor. Meetings have been held by the Corps, GPA, Chatham County, DOT and others to discuss this important subject on August 26,1997, October 28,1997 and April 28,1998. Chatham County has gone on record as stating they no longer wish to voluntarily serve as sponsor for the Savannah Harbor. The Corps has provided copies of draft PCA's and PGL47 from Washington for information. The issue of local sponsorship for Savannah Harbor needs to be clearly defined and one party identified as sponsor for the entire harbor. The Corps should be encouraging the presence of one sponsor versus several. The upcoming deepening project is the perfect opportunity to complete this matter. The statements in the study claiming that Chatham County is sponsor for the current navigation channel are false. Chatham County signed a resolution to be sponsor for the 38 ft deepening in 1967 and the tide gate project. Those resolutions were for specific projects only; not agreements to provide disposal areas for the harbor indefinitely regardless of the project depth. Chatham County has acted as sponsor for the harbor recently on a voluntary basis, not a legal basis. Please see attached document prepared by this office. GPA should be identified as the current sponsor since the last deepening.

RESPONSE: The non-Federal sponsor of the harbor improvement project will be the entity that signs the CED agreement for construction. The requirements of that entity will be described in that document. At this point, those requirements are expected to be those which follow the current policies as explained in Corps' PGL 47 titled "Cost Sharing for Dredged Material Disposal Facilities and Dredged Material Disposal Facility Partnerships." Again, at this point, it appears that GPA will become the single non-Federal sponsor for the entire Savannah Harbor Navigation Project, assuming all the responsibilities of Chatham County related to the harbor.

6. COMMENT: The statements in the study indicating that the study has been conducted with close coordination with numerous agencies is false in the case of Chatham County and the Georgia Department of Transportation (DOT). We have not been invited to participate in any meetings or efforts for the study. A meeting was held on May 15,1997 ; the agenda included an afternoon session to discuss the Deepening project, but the afternoon session was canceled by GPA. The Public Scoping Meeting held on July 9, 1997 has been our only opportunity to participate in the process. Chatham County sent a representative. All of our verbal and written requests to be included in the process and our

requests for interim reports have not been responded to. We have unofficially and informally provided our plans for raising dikes and other works for the disposal areas while the Corps and Georgia Ports Authority (GPA) have attempted to bilaterally plan the use of the disposal areas for the Deepening Project between the dike construction periods. The logic of using the areas during the planned drying periods is not based on a working knowledge of the planned management of the disposal areas according to the LTMS (Long Term Management Strategy Study). We are disappointed that our participation was not requested for this important project. DOT has funded $96,342,492 for the Savannah Harbor disposal areas since 1973; DOT owns and pays taxes on 4660 acres of the total 5999 acres in the disposal areas and, we regard all parties as equal partners in the management of the disposal areas.

RESPONSE: The feasibility study was indeed conducted in close coordination with numerous agencies, even though Chatham County and GADOT were not among them. The engineering studies performed for the study were conducted based on information available to the engineers. Additional information from your organization was not needed. The studies did use the plans your agency provided for your future dike raising and CDF management activities as a basis for the Project's CDF capacity evaluations. GPA does consider both GADOT and Chatham County as vital partners in the present management of the harbor CDFs.

Feasibility Report

7. COMMENT: Introduction. Page 2. Sect 2.1.c. Why is the Corps allowed 180 days to review their own study while those who have never seen it only get 45 days?

RESPONSE: Sixty days were given for the public to review the study documents. The 45-day period was established by Congress under NEPA as adequate for the public to review and comment on all proposed Federal projects. The 180-day duration was established by Congress for the ASA(CW) to review Section 203 documents and provide a report to Congress on whether the study and the process under which the study was developed comply with applicable Federal laws and regulations.

8. COMMENT: Introduction. Page 12. Sect. 2.9.3. The resolutions passed by Chatham County were for the specific project to deepen to 38' and the tide gates only. The statement in the study is not complete. It should state that Chatham County is presently acting voluntarily in the role as sponsor and there is no legal obligation for them to do so.

RESPONSE: The Tidegate was taken out of service, but remains a component of an authorized Federal Project. The sponsor's responsibilities remain in effect until they are either assumed by another party or the project is deauthorized.

9. COMMENT: Baseline Conditions. Page 8. Sect. 3.1.6. The use of the areas has not been officially coordinated with Chatham County or DOT. It is possible that the LTMS will be fully implemented by July 1999 and the use of adjacent areas will not be possible due to the management of the areas as outlined in the LTMS.

RESPONSE: During the engineering evaluation, an assessment was made that it was unlikely that the CDF rotational use component of the LTMS would be implemented before the proposed project was constructed. Should future events reveal that assessment to be incorrect, the Project would reassess its plans in response to those conditions.

10. COMMENT: Problem Identification. Page 4. Sect 4.3.1. a)Does federal policy require disposal capacity for 50 years or 20 years? The areas may be too high and small to feasibly dredge into them before the 50 year period ends. A quick analysis of area 12B indicates that in 50 years (if the dredging / dike raising schedule continues as it has) the dikes will be at elevation 117 ft MLW and the size of the area will be reduced from the current 703 acres to 320 acres due to stepping in with each subsequent raising. b)Will the dredge be capable to *pump* this high ? c)Has the cost of a booster pump (if needed to pump this high) been included in the maintenance dredging costs over the 50 year period? d)At what point is the size of the area too small to dredge into?

RESPONSE: (a)Federal policy requires that a proposed project identify the site for depositing dredged sediments over the life of the project (50 years). The engineering evaluations performed for this study indicate that CDF 12A would be usable throughout the 50-year project life.

(b) Yes. A dredge is expected to be able to pump that high.

(c) No booster pumps are expected to be needed to accommodate the additional height.

(d) Water quality considerations are the main criteria for determining the minimum size of a useable CDF. Therefore, the quality of the sediments and the required quality of the effluent would need to be known before determining the minimum acceptable size for a CDF.

11. COMMENT: Section 5.1.5. Page 5. How much of 2A will be lost?

RESPONSE: Approximately 1.2 acres of Disposal Area 2a will be lost

12. COMMENT: Section 5.4.8. Page 36. The analysis to determine whether or not to construct a new area only looks at initial construction of the deepening project. The maintenance of the channel after construction should be analyzed as referenced in section 4.3. 1. To pump to area 12A for 50 years will cost $201,500,000 versus the dike costs to join 1N and 1S of $3,800,000. It is surprising that the Corps would not be encouraging the referenced dike construction given the magnitude of difference in costs. Areas 1N and 1S should be

combined during the deepening project to reduce subsequent maintenance dredging costs. To hydraulically construct the area during the deepening construction, the costs would be greatly reduced by including it in the dredging contract and the sponsor (GPA) would be eligible to have the costs shared by the federal government.

RESPONSE: The costs of any incremental change in maintenance are to be included in the evaluation of a proposed project. The costs of pumping upper harbor sediments would not have to be included if those sediments would be pumped to CDF 12A even if the proposed project does not occur.

13. COMMENT: Section 5.4.6. Page 35. If the existing channel is 42 ft and you deepen 6 ft, how do you arrive at 50 feet? It is not appropriate to add the 2' allowable overdepth since it is not guaranteed to be dredged. By definition, allowable overdepth is a pay section below the required depth allowed to the dredging contractor due to inaccuracies in finely controlling the cutterhead. Also any advance maintenance currently existing is suppose to be preserved after the deepening (as stated in the study) and should not be included as the project depth.

RESPONSE: The final study documents will be revised to state that 8 feet of new work dredging would be required to construct the 50-foot channel alternative.

14. COMMENT: Section 5.4.9. Page 38. The location of final disposal site should be stated here instead of requiring the reader to completely read the document.

RESPONSE: The final disposition of the debris is not needed in this section. The main point was intended to be that the project costs recognized that debris would be encountered; and that the types, locations and amounts were estimated. Based on that information, a reviewer could assess whether this issue was adequately addressed.

15. COMMENT: Section 5.4.13. 1. Page 39. Why wasn't Chatham County and DOT allowed to review the Draft EIS when it was apparently distributed earlier?

RESPONSE: The DEIS was not distributed earlier. The review discussed in that section is the 45-day comment period in which both Chatham County and GADOT participated.

16. COMMENT: Section 5.4. 13.3. Page 4 1. When will the mitigation for the previous deepening project to 42 ft be completed? DOT agreed to give 25 acres on Jones Island to GPA for mitigation of wetlands during the 42 ft deepening as long as GPA completed the legislative actions necessary to complete the transfer. To date this has not been completed.

RESPONSE: The transfer of land for the 1994 Deepening Project is nearing completion.

17. COMMENT: Section 6.2. Dredging Non- Federal Berth. Page 3. Have all the berth owners been afforded an opportunity to have their berths dredged during the deepening project?

RESPONSE: The deepening of only one berth is included in the project costs, as only one berth is required to be deepened to receive the vessels upon which the Project benefits are based. A private berth owner always have the option of separately contracting with dredges that are in the harbor to service to his facility.

18. COMMENT: Table 6-5. Page 12 (one of several). a)Who will pay for the differential additional maintenance dredging costs each year? b)Who will pay to maintain the water intake structure?

RESPONSE: (a) The differential additional maintenance dredging costs are a cost of the proposed project and are cost shared between the Federal government and non-Federal sponsor.

(b) No additional maintenance costs are anticipated for the relocated water intake structure. Therefore, this feature would not add to the project costs.

19. COMMENT: Section 6.8. Page 13. Will GPA be the sponsor after construction and responsible for providing disposal areas for maintenance of the project?

RESPONSE: See response to GADOT Comment 5.

20. COMMENT: Section 7. Page 1. Why is the term "tentative" used? A study of this magnitude should have a definite plan.

RESPONSE: When study documents are in the draft stage, identification of only a Tentatively Recommended Plan is appropriate. Selection of a definite plan occurs after review of the public and agency comments on the draft study documents.

21. COMMENT: Section 7.1.2. Page 5. There will probably be a shift in the locations of shoals for maintenance as there was following the last deepening. The frequency of raising dikes at area 2A including numerous small dike raisings has greatly increased following the last deepening. Our records indicate that between 1980 and 1993, the Corps placed an average of 418,113 cubic yards (exclusive of Widening Project) per year into area 2A; after the 42 ft deepening, from 1993 to 1997, the Corps has placed an average of 887,373 cubic yards (exclusive of recent 2.1 million advance maintenance cubic yards) per year into area 2A. We have used numbers provided by the Corps to compute the averages. This is a clear increase in use of 2A which we attribute to redistribution of shoals in the harbor as a result of the last deepening project. Based on our actual observations, not theoretical hypothesis, we

anticipate the proposed deepening to 50 *ft* will relocate additional shoals upstream, thus increasing the dredging and disposal costs. What data was used to make the determinations of no increase in maintenance dredging costs?

RESPONSE: A shift in maintenance sediments is expected upstream of the Talmadge Bridge. The volume of that shift and the differential costs of transporting those sediments to a CDF were evaluated. Since the shift in sediment location would remain within the channel section currently treated as a single section in the dredging contract, no increase in cost is expected. The same volume of sediments would be required to be excavated and transported from the same length of channel as under present contractual practices.

22. COMMENT: Section 7.3.4. Page 12. When the plug at New Cut is reopened, will Chatham County be relieved of maintenance responsibilities for the plug as defined in the PCA (Project Cooperation Agreement) dated January 13,1992?

RESPONSE: No. Since the plug at New Cut is only one feature of the Back River Section 1135 Project. Since that Section 1135 Project will not be deauthorized by this Project, the County's responsibilities as non-Federal sponsor for that project will remain in effect unless subsumed by some other party.

23. COMMENT: Section 7.3.5. Page 14. The bass window lower limit has been changed to station 53+250.

RESPONSE: Concur. The EIS will be revised to reflect this.

24. COMMENT: Table 7-6. Page 16. The costs may change following completion of the ship simulator study.

RESPONSE: Concur. Some minor changes are expected in the Project's cost estimate as the design is refined. New authorization from Congress would be required before those changes could increase the total cost of the Project by more than 20 percent.

25. COMMENT: Section 7. Page 23. Figure 7-5 is missing.

RESPONSE: Concur. This will be corrected when the final study documents are prepared.

26. COMMENT: Section 8.3. Page I 1. a)Can it be plainly stated if GPA as sponsor under Section 204 is responsible to provide disposal areas for subsequent maintenance of the project? b)If not, will a separate agreement be developed to define who is responsible for continued maintenance of the harbor? Chatham County has gone on record as stating they no longer wish to act as sponsor for the Savannah Harbor.

RESPONSE: See response to GADOT Comment #5.

27. COMMENT: Section 9.1.1. Page 1. Why wasn't Chatham County and DOT considered to have a vital role in the feasibility study?

RESPONSE: The engineering investigations and analyses performed for this feasibility study used either existing information or data developed as part of this study. New data or assistance from Chatham County or GADOT in conducting those analyses was not required. The evaluations assumed a continuation of the practices and procedures used at the CDFs, a position based on documents produced or approved by Chatham County or GADOT.

28. COMMENT: Section 9.1.3. Page 1. Why wasn't Chatham County and DOT considered to be an "involved group"?

RESPONSE: The primary focus of the group were to adequately scope and address the environmental issues of the Project.

29. COMMENT: Section 9.1.4. Why wasn't Chatham County and DOT considered to have an interest in Savannah Harbor?

RESPONSE: The primary focus of the group were to adequately scope and address the environmental issues of the Project.

30. COMMENT: Section 9.1.7. Page 3. Why wasn't DOT invited to the November 1997 meeting? DOT owns 75% of the disposal areas as well as the old radio antennae site on Hutchinson Island. Chatham County owns several fee parcels and easements on Hutchinson Island resulting from the Widening project in 1990.

RESPONSE: This was an oversight on GPA's part.

31. COMMENT: Section I 0. Page 2. Why aren't the responsibilities of the sponsor listed in detail as they have been in all other Corps Feasibility Studies?

RESPONSE: GPA chose to summarize the description of those responsibilities. GPA recognizes that the non-Federal sponsor of the Project would have to agree to whatever responsibilities are required of it by the Federal government at the time of the authorization.

32. COMMENT: Acronyms. a). LERR stands for Lands, Easements, Rights-of-Way, and Relocation. If disposal areas are to be included, the proper acronym is LERRD. b). The "T" in TEU stands for "Twenty-foot", not "Ton".

RESPONSE: Concur. These will be corrected in the final study documents.

Real Estate Appendix

33. COMMENT: The section numbers do not correspond with the paragraph numbers in the text.

RESPONSE: Concur. These will be corrected in the final study documents.

34. COMMENT: Section 2,page I states navigational servitude will not be invoked, yet section 3.2, page 1, describes the action of navigation servitude being invoked towards TIC (The Industrial Company) bulkhead. Based on our experience about navigational servitude during the Channel Widening Project of 1990, it is our opinion that removal of the TIC bulkhead would be through navigational Servitude. Why does the study not identify the removal of the bulkhead as a navigational servitude action?

RESPONSE: Concur. Navigational Servitude would be invoked on the TIC for the removal of the bulkhead.

35. COMMENT: Section 6. Page 1. a)Since improvements (wideners) outside the North toe of the navigation channel below Fig Island are in the State of South Carolina, are mineral leases required from that state? b) Does Widening towards the South Carolina side of the state line (station 55+000 to 52+500 and others) violate the language in the Federal Appropriations Bill which prohibits the Corps from taking lands in Jasper County, South Carolina?

RESPONSE: (a) The channel improvement/sloughing easement would provide sufficient interests in the property to perform the anticipated work.

(b) Congressional authorization of this Project would supercede previous Congressional action for those specific sites.

36. COMMENT: Section 9. Page 1. Would the property owners more likely accept the project if their lands were purchased fee simple rather than buying an easement? The owner of property burdened with an easement is still required to pay taxes on the land which they have little, if any, ability to develop. The cost of an easement is nearly the cost of fee acquisition anyway.

RESPONSE: The Federal government does not acquire more interests in a property than are necessary to conduct the Federal action proposed for that property. If the cost of fee simple is the same as the cost of the necessary easement, the Federal government may acquire the property in fee.

37. COMMENT: The extension of the bar channel 25,000 feet is beyond the jurisdiction of the State of Georgia waters. a)Who owns and/or has jurisdiction concerning the real estate under the ocean in this area? b) What agency governs the activities in this area?

RESPONSE: The state of GA has jurisdiction within 3 miles of its coastline. Oceanward of that line, the Federal government has jurisdiction. The GADNR-OCRM administers the Federal Coastal Zone Management Program within the state of Georgia. The SCDHEC-OCRM administers that program within the state of SC. Those agencies administer the activities that are conducted within the band of 3 to 11 miles from the coastline.

Engineering Appendix

38. COMMENT: Section 4.3. Page 4. See our comment #23.

RESPONSE: The lower limit for dredging during the striped bass window is Mile 12 (Station 63+360). The EN Appendix has been revised to reflect this station.

39. COMMENT: Section 4.3. Page 5. Last paragraph. Chatham County is voluntarily acting as sponsor and is not legally responsible for dike construction.

RESPONSE: Noted.

40. COMMENT: Section 5.4. 1. Page 7. What determines the final channel alignment, the ship simulator study or one actual transit by the people identified in the text? If the simulator study differs from the assumptions made during the transit, the cost estimates will be affected.

RESPONSE: The ship simulator work as well as the experience of the pilots and knowledge of the designers will be used in determining the final channel alignment. It is recognized that costs may change as a result of not performing the simulator study in the feasibility phase of the project. This possibility was considered in detail at the beginning of the study.

41. COMMENT: Section 5.4. 1. Page 7. The paragraph discussing the dikes at 2A seems to contradict the text in 5.4.4.3. It is first stated that " The Kings Island fuming basin was also widened 76 feet. This is the maximum possible enlargement which can be accomplished without impacting the dikes in disposal area 2A." In section 5.4.4.3 on page 12 it is stated "... will require the relocation of approximately 1100 feet of disposal area 2A dike... ". Which scenario is being planned?

RESPONSE: The dikes in disposal area 2A will be relocated.

42. COMMENT: Section 5.4.2. Page 8. a) Where is Table 3? Assuming Table 5-1 is the table to find the bottom channel width with advanced maintenance, the mathematics needs checking. As stated in the text, a 50' channel will be 48 ft narrower than the existing channel but, the table indicates that 500ft - 48 ft = 464 ft instead of 452 ft. b)How does the advance maintenance influence the bottom width? Also, Table 5-1 indicates the channel is 500 feet wide at station 100+000. The widening project in 1990 ended at station 97+750. c)When was the reach from 97+750 to I 00+000 widened from 400 ft to 500 ft?

RESPONSE: a) Table 3 is Table 5-1. The mathematics are correct. b) The narrower channel width is computed based on deepening from the existing advance maintenance depth at a 500-foot width. For example, Station 65+000 has 4 feet of advance maintenance and is 500 feet wide. Projecting the 1V on 3H side slope to the 50-foot depth would reduce the channel width 24 feet (50-46 = 4x3x2 = 24 feet). c) The turning basin and channel above Station 97+750 are the same depth.

43. COMMENT: Table 5-1. The new channel widths are less than 500 ft in the inner channel. This conflicts with the feasibility study that justified the Widening Project of 1990. a)What has happened since the critical need to widen the river in 1990? b) Does this violate the federally authorized channel width of 500 ft?

RESPONSE: (a) The 500-foot wide channel was based on two-way traffic. The channel width in the present Project is based on one-way traffic of the design vessel.

(b) No, the 42-foot channel would still have a 500-foot width.

44. COMMENT: Section 5.4.4.3. Page 12. Since Chatham County and DOT have not been invited to participate In the decision for need and design for relocating the dike at area 2A , we will not accept any immediate or long term responsibility for any failures or any liabilities associated with this action. It is disappointing to the parties that have managed the disposal areas for the past 20 years to learn of proposed dike relocations during the course of reviewing this feasibility study.

RESPONSE: None.

45. COMMENT: Section 6. Page 2 is blank.

RESPONSE: Concur. This will be corrected when the final study reports are prepared.

46. COMMENT: Section 6.3. Page 7. During the study phase of the 42 ft deepening project, the ship simulator study required the channel be widened toward the North toe from

station *5 1* +000 to station 40+500. That decision was made for a smaller ship than the current design vessel. Cultural resource studies were completed, a training wall was removed, and wetlands were mitigated, all at a considerable expense. Now, without the benefit of a ship simulator study for a larger ship, the decision has been made to widen towards the inside of the curve. It appears this decision is made simply to avoid the buried gas lines and thus save construction money and has little to do with the movement of ships. Since part of Elba Island is for sale, why not buy it and relocate the channel to remove the sharp curve in the river?

RESPONSE: The allegation that the channel was designed to avoid relocation of the gas pipelines is incorrect. The alignment is based on a combination of actual practice, computations of required radius of bends, and results of previous simulator modeling.

47. COMMENT: Section 6.4. 1. Page 10. In addition to our comment #21, it also appears that plugging Middle River and opening New Cut, and the plugs around Hog Marsh Island will have a hydraulic effect on the shoaling patterns of the harbor. It will be interesting to see the results of the sedimentation model when it is available. This is our request for a copy of the sedimentation study when it is completed.

RESPONSE: Noted.

48. COMMENT: Section 6.5. Page 11. The landing between 12A and 12B is designated as a debris off loading ramp. This is part of the former Simpson and Thomas property purchased because the Corps easement was being questioned. Does the Corps easement on this property allow for this type of work?

RESPONSE: A temporary work easement will be obtained for this site.

49. COMMENT: Section 7. Page 1. Since this plan does not supersede the LTMS, how can areas 12A, 12B, and 13A be dredged into within months apart and the areas be rotated for drying and bird management?

RESPONSE: The long-term strategy of disposal area use will not be affected. There will be some short term impacts to the rotational use and dewatering of disposal areas.

50. COMMENT: Section 7.1.1.7. Page 3. Have the surveys been verified? Our use of the topo produced by the Corps consultant indicated the front dike of area 13A was apparently not adjusted from MSL to MLW datum.

RESPONSE: Noted.

51. COMMENT: Table 7- 1. Page 4. How is the minimum elevation of 30' MLW at area 12A determined from the referenced topo?

RESPONSE: Elevation was determined by looking for the lowest elevation in the .DGN file.

52. COMMENT: Section 7.1.3.3. Page 7. The use of the sites was not officially coordinated with the existing project local sponsor. We faxed a hand written list of plans for dike raising and other work for the disposal areas to the Corps. This was the extent of the coordination. When we asked for information, the Corps replied that they were under strict instructions to not discuss the deepening project's planned use of the areas. Only through covert conversations did we have any knowledge of the deepening project's plans.

RESPONSE: Information provided on disposal area plans was obtained at the working level. The requirement from the GaDOT to request information through formal channels was not relayed to the technical elements that thought they could rely on working level contacts for information. It should be noted that the GaDOT was provided a copy of the initial disposal area evaluation which the first task completed for this study.

53. COMMENT: Section 7.1.3.3. Page 7. See our comment # 12.

RESPONSE: Information provided on disposal area plans was obtained at the working level. The requirement from the GaDOT to request information through formal channels was not relayed to the technical elements that thought they could rely on working level contacts for information. It should be noted that the GaDOT was provided a copy of the initial disposal area evaluation which the first task completed for this study.

54. COMMENT: Section 7.1.4.3. Page 17. We will not accept any liability or responsibility for any failures associated with the design and construction of the berms parallel to the front dikes to encourage the *mounding of* sand dredged during the deepening project.

RESPONSE: Noted.

55. COMMENT: Section 7.1.5. 1. Page 19. The schedule of work has changed.

RESPONSE: Please provide the revised schedule.

56. COMMENT: Sections 6.7 and others. The table #s in the text do not correspond to the table titles.

RESPONSE: Table numbers have been revised.

57. COMMENT: Section 7.1.7.2. Page 26. Will the dike raisings needed for the deepening project invoke WRDA96 where the Corps shares the cost and GPA will be

sponsor for these areas? Again, the issue of local sponsor needs to be seriously addressed in this project.

RESPONSE: Noted.

58. COMMENT: Section 7.1.7.6. Page 28. We normally construct a 16 ft to 20 ft dike width rather than 12 ft.

RESPONSE: Final designs will be performed in the next project phase.

59. COMMENT: Section 7.2. 1. Page 29. Who does the Corps expect to provide disposal capacity after the deepening project?

RESPONSE: The project local sponsor.

60. COMMENT: Section 7.2.2.4. Page 35. The Sediment Basin was not deepened during the last project and has collected smaller quantities of sediment than it used to prior to the plugging of New Cut and ceasing use of the tide gate structure. It has been stated that the basin should still function, only not as efficiently. In order for a "trap" to operate, it should have a lower floor elevation than the nearby channel. This is the reason given for the original construction of the sediment basin and why the Kings Island Turning Basin collects so much sediment. a)Why was it decided to not deepen the sediment basin to elevation 54 ft MLW (50' channel plus 2' advance maintenance plus 2' to trap sediment) ? b) What fundamental engineering principles have changed since the construction of the sediment basin?

RESPONSE: The sediment basin will never trap the same volume of material it did before New Cut was closed. Closing the cut changed the hydraulics in both the Front and Back Rivers. The velocities which suspended sediments and reduced the shoaling in the upper harbor and City Front areas have been reduced. Deepening the basin would probably not increase the present volume of maintenance material which shoals in the basin. With the tide gates opened, a larger volume of water, with higher velocities, flows through the sediment basin on the ebb tide. This increase in velocities does not allow the fine suspended sediments to settle as did when the tide gates operated and New Cut was open. The expansion project is not anticipated to significantly change the ebb tide velocities in the sediment basin. Kings Island turning basin functions as a trap because the velocities in the Front River were reduced when New Cut was closed and also because of the rapid change in the cross-sectional area of the river at the turning basin. This reduction in the velocities causes suspended sediments to fall out in the area of the turning basin.

61. COMMENT: Section 7.2.3. 1. Page 3 8. See our comment # 10.

RESPONSE: The analysis performed on the future improvement s to the disposal areas included calculations for dewatering and consolidation of the dredged material. It is

not known if these factors were included in the reviewers computations. Since our calculations do not indicate the dikes will be as high as the reviewer indicated, we have not included costs for boosters to pump to elevation 117 ft, MLW. The feasibility study did not assess the minimum surface area required for dredging in Savannah Harbor.

62. COMMENT: Table 7-30. Page 40. We disagree with the dike raising frequency shown. The dikes will require raising more often than shown.

RESPONSE: Dewatering and consolidation of dredged material were considered in computing the dike raising frequency.

63. COMMENT: Section 7.2.3.3.3 and 7.2.3.3.4 on page 42. The figure numbers referenced in the text do not correspond with the figures in the back.

RESPONSE: Revised in the final draft.

64. COMMENT: Section 8.3. 1. Page 2. In 1987, the "Jim Bean", a 30 inch dredge, pumped sand from area 2A to 12A without any boosters. Are you sure you need 2 boosters during this project?

RESPONSE: The purpose of the estimate for this phase of the study is to determine the feasibility of the project based upon any contractor using “generic” equipment. Estimates for the project are based on an average of the capabilities of several dredges/pumps and are not on specific equipment. The pumping rates are part of the dredge estimating program used Corps wide. More specific equipment will be identified and used in estimates prepared during the contract bidding process.

65. COMMENT: Section 8.3.5. Page 2. Why isn't the bass fish window mentioned in this section?

RESPONSE: This section discusses environmental restrictions/activities which add costs to the project. The dredging window for striped bass is handled as a construction sequencing/scheduling requirement.

66. COMMENT: Section 11. Page 1. It is stated that costs for dike improvements will be cost shared in accordance with reference 2.8. Reference 2.8 is "Local Cooperative Agreements for New Start Construction Projects". Elsewhere in the report it is stated this project will be conducted through section 204 of WRDA86. It is our understanding that these processes are different. Please explain how this project will be conducted and how the issue of local sponsor will be resolved.

RESPONSE: The project will be cost shared in accordance with the wording in the signed cooperative agreement.

67. COMMENT: Section 12. Page 1. a) Why place 800,000 cubic yards in 2A, then remove 1,050,000 cubic yards? It would create more capacity in 2A if the 800,000 cy removed from New Cut plug were placed in IS and then remove 1,050,000 cy from 2A. This would increase the life of 2A by another year. It would also provide fill at 1S for construction of dikes when 1N and 1S are joined. b) Will the 1,050,000 cy be removed with land based equipment or a hydraulic dredge?

RESPONSE: The construction plan described in the Engineering Appendix for the mitigation features is only one of several scenarios which could be used. At this point, the primary use of the plan described was to prepare a cost estimate and to obtain environmental clearance for areas which will be impacted by the proposed plan. A final plan will not be developed until all field information and testing are performed to determine material characteristics and foundation conditions.

68. COMMENT: Section 13. 1. Page 1. Again, we will not accept any responsibility for the dike design and construction since we have not been invited to participate in the decisions thus far. When will Chatham County no longer be recognized as acting sponsor for the Savannah Harbor?

RESPONSE: Noted.

69. COMMENT: Section 14. Page 1. Please identify the agency referred to by the term "local sponsor" in this text.

RESPONSE: For the purpose of the Engineering Appendix, there is no specific agency identified as the local sponsor in this section.

70. COMMENT: Section 15. Page 1. Chatham County has recently conducted numerous subsurface investigations in the disposal areas. These are available to the Corps. This may provide a cost savings in the project.

RESPONSE: Noted.

71. COMMENT: Figure 7 & 8. Has the widening toward Hutchinson Island been analyzed for possible impacts to the construction of the trade center and hotel?

RESPONSE: A preliminary review of the construction plans of the bulkhead was performed.

72. **COMMENT:** Figure 9 & I 1. The state line is in the wrong location.

RESPONSE: Noted.

73. **COMMENT:** Figure 2 through 33. The conventional engineering drawings for construction use dashed lines to indicate existing structures and solid lines to indicate the proposed construction. Why are the Corps drawings obviously reversing the traditional method of drawing?

RESPONSE: Noted.

74. **COMMENT:** Figure 20 through 33. Why is the bar channel narrowed to less than 600 feet? There are no real estate concerns as with the inner harbor. Also, the extension from -60+000 to -85+000 is shown as narrowing an existing channel, but there is no existing channel to narrow. Why?

RESPONSE: Channel widths are less than 600 feet to reduce the total project costs. The final widths will be determined using the results of the ship simulator study.

75. **COMMENT:** Figure 34 and others. a) The typical sections do not use conventional engineering practices to list the station numbers applied to the sections. For example, by listing station numbers, you orient the perspective view; from station 102+000 to 98+750, KITB is on your left, not your right. Some contractors could legally dredge into the GPA docks as the sections are currently shown. b) There are some missing sections, i.e., what section applies to stations 98+750 to 97+750, from 89+500 to 89+000 and others? There are two sections shown for station 91+600 to 90+750, which applies? c)Were quantities for cost estimates based on these drawings?

RESPONSE: A) The Corps standard for cross sections is to orient them as if they were viewed looking upstream. Identifying stations from upstream to downstream has no relationship to the orientation of the cross section. Therefore, the reviewer's assumptions are not correct.

B) The purpose of these sections is to generally show the required template for the project, not to show the template for each station to be dredged.

C) Quantities for the project were computed using hydrographic surveys, not the cross sections.

76. COMMENT: Figure 64. The hatched area labeled "New Work Allowable Overdepth 2.0"' could be legitimately dredged. It is assumable that the material up the slope could slough in. Has stability analysis been completed with this possibility accounted for?

RESPONSE: Yes.

Economics Appendix

77. COMMENT: Section 2.4. 1. page 3. What is the maximum depth the Savannah Harbor can be dredged to? While ships continue to grow in size, the harbor has physical limitations due to real estate, development, and environmental factors. If this deepening project ($195 million) only lasts 4 years as the last deepening project ($50 million) did, and the next deepening ($?) only lasts 4 years because of larger ships, are the investments feasible?

RESPONSE: The maximum depth has not yet been determined. Each proposed harbor improvement stands on its own. This feasibility study is an evaluation was conducted to determine the feasibility of deepening the harbor to a 50-foot MLW depth.

78. COMMENT: Section 5.3.2. Page 12. Since the cost of using the mini-bridge from Los Angeles is essentially equivalent in cost per container to using Savannah Harbor, why not use the mini-bridge and save $195 million? This deepening project appears to only benefit the container traffic.

RESPONSE: The economic benefits for this project are based solely on those that would accrue to container traffic expected to pass through the port in the future.

79. COMMENT: Section 6.3.3. Page I 1. If the annual increase in cost due to unidirectional ship traffic flow is only $200 for the proposed 50 ft channel, how was the widening in 1990 justified? Have the ships grown in size to the extent that the number of transits has been cut in half?

RESPONSE: The economic projections contained in the feasibility study for the 1990 Widening were performed in 1976 using 1975 data. Significant growth has occurred over that roughly 20-year period in the size of vessels using this harbor. Further growth is expected in the size of those vessels. The two-way movement of vessels using the 38-foot and 42-foot channel depths remains needed and economically justified.

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80. COMMENT: Section 2.4. Page 3. See our comment # 6.

RESPONSE: See the response to GADOT Comment #6.

81. COMMENT: Section 2.4. 1. Page 4. Is the term "decommissioned" the same as "deauthorized by Congress"? When will Chatham County no longer be recognized as local sponsor for the fresh water canals, and New Cut? Also, when will the property adjacent to the tide gates be returned to Chatham County?

RESPONSE: No, decommissioned is not the same as deauthorized. Chatham County will retain its responsibilities until either the project is deauthorized by Congress or some other entity assumes the County's legal responsibilities.

82. COMMENT: Section 3.5. 1. Page 7. And Section 4.4.2. page 32. See our comment # *5.*

RESPONSE: See the response to GADOT Comment #5.

83. COMMENT: Section 5.4.2. Page 3 1. Has the increase in operational and maintenance costs for water users been included in the B/C analysis?

RESPONSE: No increase in operational or maintenance costs for water users is expected.

84. COMMENT: Section 5.7. 1. page 53 & 54. See our comment # 16. Also, our addition of the listed impacted acreage total 62.71 acres instead of 40.21 acres. We included: 5.16 ac (bend wideners) + 0.05 ac (debris ramp) + 3.0 ac (filling oxbows at Steamboat Cut) + 7.5 ac (river bottom at Steamboat Cut) + 2.0 ac (river bank near plugs at confluence of Middle and Front Rivers) + 10 ac (GPA marsh creation) + 15 ac (river bottom for plug Middle River) + 20 ac(remove plug at New Cut) = 62.71 acres. Please identify where we made an error.

RESPONSE: See the response to GADOT Comment #16.

85. COMMENT: Section 5.7. 1. Page 53. As stated, marsh was created to mitigate wetland impacts from the previous deepening project. The current mitigation plan proposes to impact those same wetlands. Will the 10 acres created as mitigation for the previous deepening project need to be replaced once or twice?

RESPONSE: The wetlands impacted at New Cut will require mitigation in the same manner as would any other existing wetland.

86. COMMENT: Section 5.7.2. Page 54. It is stated that the plugged Steamboat River oxbow will yield wetlands to mitigate the 40.21 acres. How many acres are included in the proposed oxbow lake?

RESPONSE: The Steamboat River has approximately 139 acres available for use as wetland creation.

87. COMMENT: Section 5.7.3. Page 57. a)Are the required 12,000 acres for tidal freshwater marsh habitat mitigation included in the 2,925 acres proposed for incorporation

into SNWR? b)Is this the proposed land shown in Figure 4-18? The text never references Figure 4-18. c) Is the land in Fig 4-18 within the confines of Mulberry Grove? d)Whatever happened to the idea of swapping Mulberry Grove for lands owned by SNWR at areas 1N and 1S so a larger upstream disposal area could be constructed?

RESPONSE: The acreage identified as potential mitigation acquisition tracts is included on the SNWR list of desired land acquisition. This list includes approximately 12,000 acres but not all is proposed to be acquired through this project and donated to the refuge. The SNWR list includes the tract depicted in Figure 4-18 and this tract is not located within Mulberry Grove. The concept of a land swap involving Mulberry Grove and SNWR lands was never considered by this project.

88. COMMENT: Section 5.8.3.3.2. Page 66 through 68. Each paragraph begins with a sentence "sta x to sta y, left bank, bottom width of Z feet". What is meant by the term " bottom width of feet"?

RESPONSE: The stated width is the maximum width of the bend widener as measured at the bottom toe of the channel prism.

89. COMMENT: Section 7. The first sentence is inaccurate. See our comment # 6.

RESPONSE: See the response to GPA Comment #6

90. COMMENT: Section 7.3.3. Page 7. We look forward to a response to each of our comments.

RESPONSE: This enclosure to the EIS contains responses to all written comments received as a result of the public review of the draft study documents.

Attachments

91. COMMENT: Section 8.1.1.2 Page B-26. The underdrains will drain to the Savannah River, not the Wright River.

RESPONSE: Concur. The study documents will be revised to reflect this.

92. COMMENT: Section 8.6. Page B-29. See our comment # 23.

RESPONSE: Concur. The EIS will be revised to reflect this.

93. COMMENT: Management of the ODMDS. Page C-3. Who from Chatham County participated in establishing an interagency Site Management Plan for the ODMDS?

RESPONSE: The Site Management Plan was developed as part of the 1996 LTMS Study.

94. COMMENT: Hazards to Fishing,.. Page C-9. It may be necessary to publish notices to fishing vessels concerning the 25,000 foot bar channel extension. We do not want to repeat the situation created at Wanchese Harbor near Oregon Inlet, NC where fishing boats were colliding with ships.

RESPONSE: A Notice To Mariners will be published for both the construction and the extended channel.

95. COMMENT: Advance Maintenance. Page E-2. Kings Island Turning Basin has 8 ft of advance maintenance instead of 6 ft.

RESPONSE: Six feet of advance maintenance at the KITB is all that has been environmentally approved.

96. COMMENT: Erosion and Sedimentation. Page E-24. This section appears to be the only opportunity (other than 5.4.3 of Engineering Appendix, which does not address our concerns either) to address erosion of the streambank, even though the text focuses on non-related land disturbing activities. The federal navigation channel is the reason large ships utilize the harbor. The large ships generate damaging transverse bow waves that erode the banks on both sides of the river. Deeper channels invite larger and faster ships, thus more erosive forces. Chatham County and DOT have completed a construction contract to protect the front dikes of some of the disposal areas from the
erosion. The design of the revetment was based on observations and data collected subsequent to the 42 ft deepening project. We did not have knowledge in 1995 that a 50 ft deepening project was being addressed. A phased contract to protect the front dike of Jones Oysterbed Island will be signed this year. The Corps study should analyze the impacts the deepening project (resulting in larger, faster ships transiting the harbor) will have on the banks of the river

RESPONSE: The feasibility study evaluated the direct effects of the Project's construction. Since the Corps cannot control the speed of vessels moving through the harbor, it also cannot control the impacts which wakes from those vessels may cause. Damages resulting from vessel wakes are the responsibility of the vessel captain.

97. COMMENT: Enclosure F. Appendix A Definitions. "Griffin" should be "Griffen".

RESPONSE: This section will be revised in the final study documents.

98. COMMENT: Have all the MOAs been signed?

RESPONSE: The cultural resource PMOAs have not yet been signed by all parties. Approvals and signatures from all parties will be required before work can be conducted under the PMOA. Harbor work required by the PMOA must be performed prior to the completion of the construction.

99. COMMENT: DOT is still reviewing the sediment quality report and will provide comments as soon as they are available.

RESPONSE: The comments will be addressed if received before the study reports are finalized..

South Carolina Department of Natural Resources

James A. Timmerman, Jr., Ph.D.
Director
Paul A. Sandifer, Ph.D.
Deputy Director for
Marine Resources

June 18, 1998

Colonel Grant M. Smith
District Engineer, Savannah District
Department of the Army, Corps of Engineers
P.O. Box 889
Savannah, Georgia 31402-0889

RE: Draft Environmental Impact Statement
(DEIS) and Feasibility Report;
Savannah Harbor Expansion Project

Dear Colonel Smith:

The S.C. Department of Natural Resources (SCDNR) has reviewed the Draft Environmental Impact Statement (DEIS) and Feasibility Report for the Savannah Harbor Expansion Project, and offers the following comments for your consideration. These comments are provided pursuant to the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. et seq.).

The SCDNR submitted written comments on the Preliminary Environmental Impact Statement (PEIS) to Mr. Bo Ellis of Applied Technology and Management (ATM), consultant for the Georgia Ports Authority (GPA), by letter dated February 25, 1998. Most of our earlier comments have not been addressed in the DEIS. The SCDNR still shares the concern expressed by the US Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NMFS), the Georgia Department of Natural Resources (GADNR), and others, that the proposed deepening project may result in irreversible and unacceptable adverse impacts on tidal freshwater marsh and striped bass spawning habitat. Both of these valuable resources are increasingly rare in the Savannah

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River system, and the SCDNR is concerned that even those modest increases in salinity predicted by ATM's hydrodynamic model could preclude the recovery of both freshwater wetlands and striped bass populations from the adverse effects of earlier alterations of the system (i.e., the operation of the tidegate and previous deepening projects).

Evidence presented by the USFWS indicates that, due to the cumulative impacts of past harbor modifications, the total acreage of fi7eshwater marsh in the Savannah National Wildlife Refuge (NWR) has decreased by 53% since it was first established in 1927. As a result of the proposed deepening project, the USFWS projects that only 27% of the original tidal freshwater marsh would remain. This represents a 42% decline in the current acreage of freshwater marsh due to additional salinity intrusion from the proposed 50' deepening project. As an "impact avoidance feature" to lessen the anticipated salinity intrusion into the Middle and Back Rivers, closure of the Middle River is proposed as a feasible option; however, the DEIS does not provide any supporting data to substantiate this assertion. Furthermore, salinities are likely to increase in the Front River as a result of the proposed closure, resulting in the further loss of freshwater wetlands and striped bass spawning habitat in that system. The SCDNR also has serious concerns about the potential effects of closing the Middle River on currents, shoaling, tidal flushing, and water levels, as well as the ingress and egress of fish and other aquatic species to and from the Middle and Back Rivers. Consequently, the SCDNR believes that the proposed closure is inadvisable, and should not be pursued without further detailed study of its potential effects. A more acceptable avoidance option would include deepening to considerably lesser depths, in combination with increasing flows at critical times from upstream reservoirs. Neither of these options is considered in the DEIS, although they have been suggested numerous times by various resource agencies. Before the SCDNR would consider any deepening alternative to be acceptable, however, the additional model simulations for both salinity and dissolved oxygen would have to be completed, as requested repeatedly over the last year by the USFWS, the SCDNR and others.

The proposed compensation for any loss of freshwater wetlands due to salinity intrusion is the acquisition of land for incorporation into the SNWR; however, it is our understanding that there is very little tidal freshwater marsh available for purchase outside of the SNWR. Furthermore, the SCDNR does not consider the purchase of dissimilar wetlands and uplands, without any provision for wetland restoration or improvement, to constitute adequate mitigation for the loss of tidal freshwater marsh. In addition, the proposed compensation for the direct loss of wetlands due to the construction of bend wideners and closure of the Middle River is unacceptable. Most of the compensatory acreage would be obtained by constructing wetlands within the Steamboat Cut oxbow, which would be plugged as part of the Middle River closure. As stated above, the SCDNR thinks that the proposed closure is inadvisable at this time. Furthermore, as stated in our earlier comments on the PEIS, the SCDNR does not generally support marsh creation as mitigation for wetland loss because of its low probability of success and adverse impacts on other types of valuable subtidal and intertidal habitat for fish, birds, and wildlife.

The SCDNR also believes that the predicted decrease in bottom dissolved oxygen (DO) levels in and around the Kings Island Turning Basin (KITB), a known nursery and foraging area for the endangered shortnose sturgeon, could further jeopardize the viability of this population. Based on ATM's hydrodynamic model, bottom DO levels in the KITB are predicted to equal or exceed 3.5 mg/l only 50% of the time under average summer flow conditions of 8,200 cfs. This represents a 13% decrease in the amount of time this marginal DO level will be met under average flow conditions. Additional data on actual and predicted minimum dissolved oxygen levels, which were provided to us by ATM at our request, demonstrate that dissolved oxygen concentrations in the vicinity of the KITB would fall below sublethal levels (3.0 mg/1) substantially more often -and for longer periods of time following the proposed 8' deepening. These data also indicate that dissolved oxygen concentrations in the vicinity of the KITB would periodically fall below lethal levels (2.0 mg/l) during the summer months, as a result of the proposed deepening project. The SCDNR believes that these data should have been included and discussed in the DEIS. More importantly, however, the SCDNR believes that these data show that the proposed 8' deepening alternative would have unacceptable adverse effects on the endangered shortnose sturgeon, and other aquatic species as well.

In our earlier comment letter, we outlined several research studies that would be needed to fully evaluate the impacts of the proposed deepening project on shortnose sturgeon. These included controlled laboratory experiments to determine the synergistic effects of temperature, salinity, and dissolved oxygen on juvenile sturgeon, as well as a 5-year monitoring study to evaluate the impacts of deepening on the abundance, spatial distribution, age class structure, and habitat use of shortnose sturgeon in the Savannah River system. Although a 5-year monitoring study was originally proposed in the PEIS, a shorter 3-year study is proposed in the DEIS. This is unacceptable to the SCDNR, since five consecutive years is considered to be the minimum amount of time that would be required to follow an entire age class from spawning to maturity. Furthermore, the SCDNR does not believe that the proposed deepening of the Port Wentworth Turning Basin would necessarily constitute adequate mitigation for the possible loss of nursery and foraging habitat in the vicinity of the Kings Island Turning Basin. Although sturgeon are thought to use deeper areas as thermal refugia during the summer, the effects of deepening the Port Wentworth Turning Basin on bottom DO, salinity, temperature, and other critical habitat requirements have not been evaluated. Furthermore, the proposed closure of the Middle River would probably render this area unsuitable for juvenile shortnose sturgeon because of further salinity intrusion up the Front River. While habitat improvement may be a viable option for mitigation, further study is needed to determine the specific habitat requirements for the different age classes utilizing the lower Savannah River system. The specific details of any such mitigation plan should be closely coordinated with the National Marine Fisheries Service (NWS), as well as the SCDNR and the GADNR.

The SCDNR is also concerned about contaminant levels in the sediments proposed to be dredged. First of all, little contaminants data is actually presented in the main text of the DEIS. The reader is either compelled to accept ATM's assertion that their analysis "did not reveal any potentially unacceptable adverse effects from the excavation, transportation, discharge, and management of the material proposed for excavation", or search through one of the several supplements to the DEIS ("Dredged

Material Environmental Effects Evaluation" or "DMEEE") for relevant information. The data in the latter document is presented in a very confusing and unconventional format. The reader is must refer to the appendix tables at the back of the supplementary report (none of which are numbered) to find meaningful quantitative comparisons to ecological screening values. More importantly, however, the actual bulk sediment chemistry data that do appear in these appendix tables show numerous exceedances of sediment quality assessment guidelines (SQAGS) for several metals, organics, and organometallic complexes. These include tributyltin (TBT) levels in the Jones/Oysterbed and Nearshore reaches that are two orders of magnitude higher than the NOAA screening value of 5 ppb. Although the supplementary DMEEE recommends that these sediments be " re-tested in supplemental with appropriate organisms to determine if the Butyltin-enriched sediments are toxic to benthic organisms before placement in open water" (p. 36), no such supplementalI analyses are ever presented. Furthermore, no mention is made of this recommendation in the main text of the DEIS. Instead, it is stated that "the Nearshore Entrance Channel material should be excavated together with the underlying NW material to ensure that the butyltin compounds are not available to benthic organisms at concentrations that may create adverse effects." (Section 5.1.1). The SCDNR believes that this material may be inappropriate for open water disposal, and should be further evaluated in Supplemental I, as described in the supplementary DMEEE. Another apparent discrepancy between the dredged material management alternative recommended in the DMEEE, and that proposed in the main text of the DEIS concerns the contaminated sediments near the Savannah RACON/light from a fuel, battery, and paint lacquer spill that occurred in November 1996. In the DMEEE, it is stated that these sediments "need to be removed and placed in a confined upland facility" (p. 63)- however, in the main text of the DEIS it is stated that "the contaminated sediments would be removed by a hopper dredge ... and deposited in the ODMDS. Sediments from other - cleaner - portions of the entrance channel would be subsequently placed on top of these sediments, reducing potential exposure to benthic organisms." (Section 5.1.2). We do not believe that these measures are adequate to protect the environment, and that failure to follow the recommendations in the DMEEE could result in adverse impacts on natural resources.

Finally, as we stated in our earlier comment letter, the SCDNR believes that insufficient consideration has been given to the potential exposure of terrestrial and avian wildlife to contaminated sediments proposed for disposal in the Confined Disposal Facilities (CDFs). The supplementary DMEEE asserts that the CDFs provide "poor foraging habitat for birds and mammals because of the lack of significant plant coverage and unsuccessful benthic colonization". In fact, a recently completed report by the SCDNR to the USFWS concluded that "the abundance and diversity of the benthic infaunal invertebrates in the Savannah/Wright River disposal areas were similar to values found in previous studies of other estuarine habitats" (Levisen et al., 1997). Numerous species of migratory birds, including shorebirds, waterfowl, wading birds, and raptors, utilize the CDFs as resting, breeding, and foraging habitat. Raccoons and other fur-bearing mammals probably also forage in these CDFs. The SCDNR believes that the levels of certain contaminants, particularly dioxins and furans, warrant the consideration of special management practices to limit the potential exposure of birds and wildlife to toxic, persistent, and bioaccumulative substances. These management practices should be fully described in the final EIS.

In summary, the SCDNR believes that the deepening project as proposed could have unacceptable and irreversible impacts on important fishery resources and tidal marsh habitat. The avoidance option proposed to reduce salinity intrusion into the Middle and Back Rivers (closure of the Middle River) could also have substantial adverse impacts, none of which have been fully addressed. Other potentially more acceptable avoidance options, including lesser deepening scenarios and increased flows from upstream reservoirs, have not been evaluated in the DEIS, despite numerous requests from the resource agencies to do so. Finally, inadequate compensatory mitigation is proposed for all unavoidable impacts to wetland and fishery resources, and insufficient consideration is given to the appropriate management of contaminated sediments. For these reasons, the SCDNR does not believe that the DEIS fully addresses all of the issues that would need to be resolved prior to authorization of the project.

Sincerely,

Robert E. Duncan
Environmental Programs Director

CC:
Paul Sandifer, SCDNR
Priscilla Wendt, SCDNR
Mark Collins, SCDNR
Rob Mikell, SCDHEC-OCRM
Sally Knowles, SCDHEC-Water Quality
Charles Griffen, GPA
Bill Bailey, USACE
John Burns, USACE, CECW-PE
Wilbert Paynes, USACE, CESAD-ET-P
Ed Eudaly, USFWS
Sam Drake, USFWS, Savannah Coastal Refuge
David Rackley, NNES
Carl Hall, GADNR

Letter response

South Carolina Department of Natural Resources
P.O. Box 12559
Charleston, SC 29422-2559

Date: June 18, 1998

1. COMMENT: The SCDNR submitted written comments on the Preliminary EIS to Mr. Bo Ellis of Applied Technology and Management, consultant for GPA, by letter dated February 25, 1998. Most of our earlier comments have not been addressed in the DEIS. The SCDNR still shares the concern expressed by the USFWS, NMFS, GADNR and others, that the proposed deepening project may result in irreversible and unacceptable adverse impacts on tidal freshwater marsh and striped bass spawning habitat. Both of these valuable resources are increasingly rare in the Savannah River system, and the SCDNR is concerned that even those modest increases in salinity predicted by ATM's hydrodynamic model could preclude the recovery of both freshwater wetlands and striped bass populations from the adverse effects of earlier alterations of the system (i.e., the operation of the Tidegate and previous deepening projects).

RESPONSE: GPA has responded to the earlier comments provided by SCDNR by continued coordination and presentation of further model calibration and applications as requested by the Natural Resource Agency Group. The results of this further work are presented in the referenced modeling report and summarized in the FEIS. In addition, further evaluations will be performed and coordinated with the resource agencies in the CED phase to develop the final mitigation plan.

2. COMMENT: Evidence presented by the USFWS indicates that, due to the cumulative impacts of past harbor modifications, the total acreage of fi7eshwater marsh in the Savannah NWR has decreased by 53% since it was first established in 1927. As a result of the proposed deepening project, the USFWS projects that only 27% of the original tidal freshwater marsh would remain. This represents a 42% decline in the current acreage of freshwater marsh due to additional salinity intrusion from the proposed 50' deepening project.

RESPONSE: The acreage identified as potential mitigation acquisition tracts is included on the SNWR list of desired land acquisition. This list includes approximately 12,000 acres but not all is proposed to be acquired through this project and donated to the refuge. The SNWR list includes the tract depicted in Figure 4-18 and this tract is not located within Mulberry Grove. The concept of a land swap involving Mulberry Grove and SNWR lands was never considered by this project

3. COMMENT: As an "impact avoidance feature" to lessen the anticipated salinity intrusion into the Middle and Back Rivers, closure of the Middle River is proposed as a feasible option; however, the DEIS does not provide any supporting data to substantiate this assertion. Furthermore, salinities are likely to increase in the Front River as a result of the proposed closure, resulting in the further loss of freshwater wetlands and striped bass spawning habitat in that system. The SCDNR also has serious concerns about the potential effects of closing the Middle River on currents, shoaling, tidal flushing, and water levels, as well as the ingress and egress of fish and other aquatic species to and from the Middle and Back Rivers. Consequently, the SCDNR believes that the proposed closure is inadvisable, and should not be pursued without further detailed study of its potential effects. A more acceptable avoidance option would include deepening to considerably lesser depths, in combination with increasing flows at critical times from upstream reservoirs. Neither of these options is considered in the DEIS, although they have been suggested numerous times by various resource agencies. Before the SCDNR would consider any deepening alternative to be acceptable, however, the additional model simulations for both salinity and dissolved oxygen would have to be completed, as requested repeatedly over the last year by the USFWS, the SCDNR and others.

RESPONSE: See Response to Comment #10 in USFWS letter dated June 22, 1998.

4. COMMENT: The proposed compensation for any loss of freshwater wetlands due to salinity intrusion is the acquisition of land for incorporation into the SNWR; however, it is our understanding that there is very little tidal freshwater marsh available for purchase outside of the SNWR. Furthermore, the SCDNR does not consider the purchase of dissimilar wetlands and uplands, without any provision for wetland restoration or improvement, to constitute adequate mitigation for the loss of tidal freshwater marsh.

RESPONSE: During further development of the mitigation project we will give the highest priority to tidal freshwater marsh. Once options regarding tidal freshwater marsh are exhausted, we will give a priority to other freshwater wetlands and/or adjacent uplands. Potential tracts will be evaluated with the goal of preserving areas that preserve and enhance the quality of adjacent areas of tidal freshwater marsh.

5. COMMENT: The proposed compensation for the direct loss of wetlands due to the construction of bend wideners and closure of the Middle River is unacceptable. Most of the compensatory acreage would be obtained by constructing wetlands within the Steamboat Cut oxbow, which would be plugged as part of the Middle River closure. As stated above, the SCDNR thinks that the proposed closure is inadvisable at this time. Furthermore, as stated in our earlier comments on the PEIS, the SCDNR does not generally support marsh creation as mitigation for wetland loss because of its low probability of success and adverse impacts on other types of valuable subtidal and intertidal habitat for fish, birds, and wildlife.

RESPONSE: See Response to Comment #10 in USFWS letter dated June 22, 1998.

6. COMMENT: SCDNR also believes that the predicted decrease in bottom DO levels in and around the Kings Island Turning Basin, a known nursery and foraging area for the endangered shortnose sturgeon, could further jeopardize the viability of this population. Based on ATM's hydrodynamic model, bottom DO levels in the KITB are predicted to equal or exceed 3.5 mg/l only 50% of the time under average summer flow conditions of 8,200 cfs. This represents a 13% decrease in the amount of time this marginal DO level will be met under average flow conditions. Additional data on actual and predicted minimum dissolved oxygen levels, which were provided to us by ATM at our request, demonstrate that D.O. concentrations in the vicinity of the KITB would fall below sublethal levels (3.0 mg/1) substantially more often -and for longer periods of time following the proposed 8' deepening. These data also indicate that D.O. concentrations in the vicinity of the KITB would periodically fall below lethal levels (2.0 mg/l) during the summer months, as a result of the proposed deepening project. The SCDNR believes that these data should have been included and discussed in the DEIS. More importantly, however, the SCDNR believes that these data show that the proposed 8' deepening alternative would have unacceptable adverse effects on the endangered shortnose sturgeon, and other aquatic species as well.

RESPONSE: The effects of the predicted DO decreases in the KITB are uncertain given the paucity of knowledge of the SNS and its actual accommodation to the intermittent hypoxia that occurs in the SR during the summer months. However, given this uncertainty, the project proposes an avoidance strategy and will mitigate to prevent the DO decrease that is predicted to occur. During the next phase, the project will examine and then select from a number of alternatives (aeration, upgrading of treatment facilities, etc) a feasible method that will mitigate the effect of the predicted DO decrease.

7. COMMENT: We previously outlined several research studies that would be needed to fully evaluate the impacts of the proposed deepening project on shortnose sturgeon. These included controlled laboratory experiments to determine the synergistic effects of temperature, salinity, and dissolved oxygen on juvenile sturgeon, as well as a 5-year monitoring study to evaluate the impacts of deepening on the abundance, spatial distribution, age class structure, and habitat use of shortnose sturgeon in the Savannah River system. Although a 5-year monitoring study was originally proposed in the PEIS, a shorter 3-year study is proposed in the DEIS. This is unacceptable to the SCDNR, since five consecutive years is considered to be the minimum amount of time that would be required to follow an entire age class from spawning to maturity.

RESPONSE: Concur. A five year monitoring program is required for tracking an entire age class; accordingly, changes have been made to the DEIS proposing a 5-year study.

8. COMMENT: Furthermore, the SCDNR does not believe that the proposed deepening of the Port Wentworth Turning Basin would necessarily constitute adequate mitigation for the possible loss of nursery and foraging habitat in the vicinity of the Kings Island Turning Basin. Although sturgeon are thought to use deeper areas as thermal refugia during the summer, the effects of deepening the Port Wentworth Turning Basin on bottom DO, salinity, temperature, and other critical habitat requirements have not been evaluated. Furthermore, the proposed closure of the Middle River would probably render this area

unsuitable for juvenile shortnose sturgeon because of further salinity intrusion up the Front River. While habitat improvement may be a viable option for mitigation, further study is needed to determine the specific habitat requirements for the different age classes utilizing the lower Savannah River system. The specific details of any such mitigation plan should be closely coordinated with the NMFS, as well as the SCDNR and the GADNR.

RESPONSE: Concur. The Port Wentworth deepening proposal is not mitigation for predicted adverse impacts from a decrease in DO. The project proposes to mitigate to avoid the effects of a DO decrease altogether. The proposal for the deepening of the Port Wentworth Turning Basin is a habitat improvement proposal that is contingent (a) upon the results of studies and (b) input from agency specialists and (c) would only be implemented with agency consensus. While recognizing that little knowledge presently exists for successful implementation of such habitat extension efforts, the proposal has been made on the assumption that greater knowledge for evaluation of such improvements may come into existence in the future as a result of the 5-year monitoring program and other proposed studies.

9. COMMENT: SCDNR is also concerned about contaminant levels in the sediments proposed to be dredged. First of all, little contaminants data is actually presented in the main text of the DEIS. The reader is either compelled to accept ATM's assertion that their analysis "did not reveal any potentially unacceptable adverse effects from the excavation, transportation, discharge, and management of the material proposed for excavation", or search through one of the several supplements to the DEIS ("Dredged Material Environmental Effects Evaluation" or "DMEEE") for relevant information. More importantly, however, the actual bulk sediment chemistry data that do appear in these appendix tables show numerous exceedances of sediment quality assessment guidelines (SQAGS) for several metals, organics, and organometallic complexes.

RESPONSE: Please see the responses to the USF&WS comments on the dredged material effects evaluation. The magnitude and extent of the sampling and analysis effort does not permit copious reprinting of the DMEEE document in the EIS. SQAGs were used to screen the dredged material for potential contaminants of concern. Those contaminants, once identified were evaluated for potentially unacceptable adverse impacts to the aquatic and terrestrial systems affected by the proposed activity. The results of this evaluation are presented in narrative form with copious summary tables in the DMEEE. That determination concluded that the project material, which is primarily composed of unenriched virgin sediments, will not likely create unacceptable impacts to the aquatic and terrestrial system as a result the proposed activity

10. COMMENT: These include tributyltin levels in the Jones/Oysterbed and Nearshore reaches that are two orders of magnitude higher than the NOAA screening value of 5 ppb. Although the supplementary DMEEE recommends that these sediments be "re-tested in Supplemental I with appropriate organisms to determine if the Butyltin-enriched sediments are toxic to benthic organisms before placement in open water", no such Supplemental I

analyses are ever presented. Furthermore, no mention is made of this recommendation in the main text of the DEIS. Instead, it is stated that "the Nearshore Entrance Channel material should be excavated together with the underlying NW material to ensure that the butyltin compounds are not available to benthic organisms at concentrations that may create adverse effects." The SCDNR believes that this material may be inappropriate for open water disposal, and should be further evaluated in Supplemental I as described in the supplementary DMEEE.

RESPONSE: SQAGs do not exist for TBT. In fact, little is known about the toxicity of sediment sorbed butyltin compounds, their bioavailability, and techniques for supplemental assessment. These compounds were found primarily in the existing project O&M material, not in the target sediments for the deepening project. Therefore, project implementation will serve to attenuate any possible effects from these compounds by dilution because O&M material must necessarily be removed with the virgin project material to complete construction. The GPA, USACE, and USEPA are preparing a sampling approach to better quantify the magnitude, extent, and potential toxicity of butyltin compounds found in the Estuary sediments. Please see response to Comment 9 from the USF&WS

11. COMMENT: Another apparent discrepancy between the dredged material management alternative recommended in the DMEEE, and that proposed in the main text of the DEIS concerns the contaminated sediments near the Savannah RACON / light from a fuel, battery, and paint lacquer spill that occurred in November 1996. In the DMEEE, it is stated that these sediments "need to be removed and placed in a confined upland facility", however, in the main text of the DEIS it is stated that "the contaminated sediments would be removed by a hopper dredge ... and deposited in the ODMDS. Sediments from other - cleaner - portions of the entrance channel would be subsequently placed on top of these sediments, reducing potential exposure to benthic organisms." We do not believe that these measures are adequate to protect the environment, and that failure to follow the recommendations in the DMEEE could result in adverse impacts on natural resources.

RESPONSE: The DMEEE conclusions section referenced above will be revised to reflect the final opinion of GPA and the USACE concerning the Savannah RACON / Light tower accident, which is found on Page 33 of the DMEEE. Please see response to Comment 7 from the USF&WS for further discussion on this topic.

12. COMMENT: SCDNR believes that insufficient consideration has been given to the potential exposure of terrestrial and avian wildlife to contaminated sediments proposed for disposal in the CDFs. The supplementary DMEEE asserts that the CDFs provide "poor foraging habitat for birds and mammals because of the lack of significant plant coverage and unsuccessful benthic colonization". In fact, a recently completed report by the SCDNR to the USFWS concluded that "the abundance and diversity of the benthic infaunal invertebrates in the Savannah / Wright River disposal areas were similar to values found in previous studies of other estuarine habitats". Numerous species of migratory birds, including shorebirds, waterfowl, wading birds, and raptors, use the CDFs as resting, breeding, and foraging habitat. Raccoons and other fur-bearing mammals probably also forage in these CDFs. The

SCDNR believes that the levels of certain contaminants, particularly dioxins and furans, warrant the consideration of special management practices to limit the potential exposure of birds and wildlife to toxic, persistent, and bioaccumulative substances. These management practices should be fully described in the final EIS.

RESPONSE: Please see response to Comment 8 from the USF&WS for additional information on this topic and actions that will be taken to provide adequate assurances for the protection of terrestrial life utilizing the Harbor CDF system.

13. COMMENT: In summary, the SCDNR believes that the deepening project as proposed could have unacceptable and irreversible impacts on important fishery resources and tidal marsh habitat. The avoidance option proposed to reduce salinity intrusion into the Middle and Back Rivers (closure of the Middle River) could also have substantial adverse impacts, none of which have been fully addressed. Other potentially more acceptable avoidance options, including lesser deepening scenarios and increased flows from upstream reservoirs, have not been evaluated in the DEIS, despite numerous requests from the resource agencies to do so. Finally, inadequate compensatory mitigation is proposed for all unavoidable impacts to wetland and fishery resources, and insufficient consideration is given to the appropriate management of contaminated sediments. For these reasons, the SCDNR does not believe that the DEIS fully addresses all of the issues that would need to be resolved prior to authorization of the project.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

South Carolina Department of Health and Environmental Control
Office of Ocean and Coastal Resource Management (June 4)

DHEC

PROMOTE PROTECT PROSPER
S.C. Department of Health and Environmental Control

Office of Ocean and Coastal
Resource Management
1362 McMillan Avenue, Suite 400
Charleston, SC 29405
(803) 744-5838 FAX (803) 744-5847

June 4, 1998

Mr. Myron J. Yuchishin
Chief, Planning Division
U. S. Army Corps of Engineers
Savannah District
Post Office Box 889
Savannah, Georgia 31402-0889

Dear Mr. Yuchishin:

This letter is written in response to your request for a coastal zone consistency determination for the proposed Savannah harbor-deepening project. At this time we lack sufficient information to make this consistency review. After review of the documents, and the letters of comment from the natural resource agencies charged with management and protection of these important natural systems I feel that this decision to publish an EIS did not properly address the magnitude of the decision in light of the alterations that have already occurred within the Savannah Harbor and the uncertainty regarding the natural resource recovery from previously permitted alterations. These earlier projects such as the deepening project (42 foot channel), the widening project and the long term maintenance strategy have all required several years to collect data monitoring samples, analyze the information and assemble the recommendations and permit conditions. This was not done in this study. The public notice for this GPA construction project indicates that there will be significant environmental consequences (i.e. items A-J of the project impacts listed in the public notice) that are directly attributable to this project. It seems to me that the EIS process was hastened to eliminate consideration of many lesser alternatives and only conclude with the recommendation of a fifty-foot deepening the channel. To this end the EIS fails to properly analyze the alternative of deepening the harbor to a depths of less than 50 feet. The salinity and marsh grass succession models were only done for the maximum depth scenario. The EIS does not address the impact of any smaller shallower depths or the no build alternative.

The other agencies involved in the review; (NMFS, SCDNR, Georgia DNR and USFWS, SCDHEC OCRM and EQC) have met to discuss this project and most have raised significant issues, which we feel the EIS has failed to fully analyze. In fact, the EIS seems to pose more questions than provide answers. These issues can be found in the comment letters already written and will be further described in letters to be written on the final draft EIS. These concerns included the endangered short nosed sturgeon, which continues to be impacted by alterations to the Savannah River. Dissolved oxygen levels are shown in the applicant's own model to be below levels which will impact this endangered species. The mitigative actions, which resulted from the previous projects, are not being allowed to be fully implemented after tidegate removal. According to the monitoring studies done by the refuge, the brackish water marsh vegetation is converting to freshwater marsh grass types as predicted. This additional deepening of the harbor will render the previous mitigative actions ineffective and irrelevant resulting in an increase in vegetation conversion. The recovery efforts of the striped bass population have not been successful. This population is on the brink and might not be recoverable. Another shortcoming of the EIS is the failure of the EIS to address the long term disposal needs in the upper harbor and the need to construct additional disposal sites in the upper Savannah harbor area which will likely involve additional wetland filling. Any further alterations to this estuarine system should not be undertaken until the system is thoroughly understood and the consequences can be predicted accurately. It is our opinion that the previously permitted mitigation action which included removal of the tide gate, blocking off of New Cut and the monitoring of the recovery of both vegetation and fisheries must be allowed to proceed without additional modification.

I must also remind you that every predictive model done for modifications to this system has failed to accurately predict the consequences and impacts of the alteration. According to many of the people involved with the original permitting of the tide gate, the original salinity impacts from the tide gate were underestimated by as much as 90%. I do not know if this figure is accurate or not; however of one thing I am certain, the models have been very poor estimators of the actual consequences of these alterations. The resulting impacts have destroyed a valuable fishery, resulted in extensive changes to the Savannah National Wildlife Refuge and caused thousands of acres of wetlands to be lost to dredge and fill projects.

For all of these reasons I feel that this project should be withdrawn until such time as the additional information necessary to prepare an EIS has been assembled subjected to a peer review process. This information should include a detailed analysis of the impacts of the different alternative depths for salinity, dissolved oxygen, vegetation conversion and striped bass fisheries impacts. Also, withdrawal of the project will give the time needed to properly address the recovery and protection of the historic resources, time to properly analyze the maintenance dredge disposal needs and the proper location siting of any additional spoil disposal sites.

If this cannot be done, at a minimum I request that a 30 day extension be granted to SCDHEC- OCRM and all other agencies involved in the review of this project so that our reviews can be coordinated and the information gaps and shortfalls properly defined in our final responses. I make this request in accordance with the provisions of 15 CFR 930. Federal Consistency with Approved Coastal Management Programs. The specific

regulations this process and the granting of extensions are covered under section 930.41 (b) of the regulations.

In light of the serious impacts and nature of the resources at risk, I urge you to consider the proper course of action and ensure that this EIS is not approved until the data is available to understand these systems and the effects that this alteration will have are more thoroughly understood. A mistake at this time might be irreversible. I hope to hear from you shortly regarding this matter.

Robert D. Mikell
Manager, Federal Certification

cc. Mr. Christopher L. Brooks
Mr. H. Stephen Snyder
Mr. Rocky Browder
Mr. Ed Eudaly
Ms. Pricilla Wendt
Ms. Sally Knowles

Letter response

DHEC

SC Department of Health and Environmental Control
Office of Ocean and Coastal Resource Management
1362 McMillan Avenue, Suite 400
Charleston, SC 29405

DATE: June 4, 1998

1. COMMENT: OCRM's letter raised several issues and expressed concerns about various aspects of the draft study reports. However, the letter concluded with the comment described in #2 below.

RESPONSE: Each issue that is contained in OCRM's formal letter of comment on the proposed project will be addressed point-by-point subsequently in this Enclosure to the EIS.

2. COMMENT: Request for a withdrawal of the project proposal until such time as the additional information necessary to prepare an EIS has been assembled subjected to a peer review process, or at a minimum a 30-day extension be granted to SCDHEC-OCRM and all other agencies involved in the review of this project.

RESPONSE: Savannah District had discussions with SCDHEC-OCRM on this issue. As a result of those discussions, the District extended the comment period to July 7, 1998. This extension was satisfactory to that agency.

DHEC

Office of Ocean and Coastal Resource Management

PROMOTE PROTECT PROSPER

S.C. Department of Health and Environmental Control 1362 McMillan Avenue, Suite 400

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(803)744-5838 FAX (803)744-5847

July 2, 1998

Colonel Grant M. Smith
District Engineer
U.S. Army Corps of Engineers
Savannah District
Post Office Box 899
Savannah, Georgia 31402-0999

Re: Savannah Harbor Expansion
Draft Environmental Impact
Statement

Dear Colonel Smith:

In response to your public notice of May 8, 1998, the Final Draft of Savannah Harbor Deepening Project, Environmental Impact Statement, the Office of Ocean and Coastal Resource Management (OCRM) is providing its response to your federal consistency determination. Our conclusion is that the project is inconsistent with the policies of the South Carolina Coastal Zone Management Program. During our review of this project we have remained in close contact with the different resource agencies (U. S. Fish and Wildlife Service, National Marine Fisheries Service, South Carolina Department of Natural Resources and others) that are also responsible for the management of this area. Our concerns have been addressed previously in our June 4, 1998, letter which requests additional time and information to fully understand the issues and problems involved with this project.

Without going into a great deal of detail and reciting the many concerns that have been attributed to this project by this agency and the other resource agencies, it is certain that the impacts of this proposal would have significant and possibly irreversible environmental impacts on the Savannah Harbor estuary. These impacts include the conversion of 1,170 acres of freshwater marsh system to a brackish system, lowered dissolved oxygen levels, increased turbidity and continued harm to the striped bass and shortnose sturgeon fisheries of the Savannah River. The EIS also cannot predict to a level of accuracy agreeable to the resource agencies, the impact of deepening the channel on many interdependent and related issues, including water quality, wetlands, fisheries, wildlife, shoreline erosion, the management of dredged material and Geographic Areas of

Particular Concern (GAPCs). The ability to accurately predict these impacts is complicated by the estuary's ability to compensate for the many man-made alterations that have previously impacted the harbor area. As a result of these alterations, the present condition of the harbor is one characterized by low levels of dissolved oxygen, high turbidity, and unnatural salinity distribution patterns. These have resulted habitat loss or almost complete destruction of a once-healthy fishery. There were also concerns cited about the failure of the EIS to fully model and analyze the impacts of shallower deepening alternatives which would have lesser impact on the Savannah Harbor system. It is the common concern of all agencies involved in the review of this project that these alterations to this harbor, when so many previous alterations have taken place, could well be those which preclude recovery of the estuary.

Several mitigation proposals have been identified in the document, each of which seems to offer new problems to the restoration of this estuary. These options raise additional questions and will require a great deal more investigation so that they do not further exacerbate the existing condition of the harbor. Again, the selection of a suitable option proved most difficult because of a lack of understanding of the environmental alterations resulting from past modifications and the interconnections between the three rivers. A much more thorough study of the effects of these past modifications and the impacts of any deepening proposal will require much more examination before the success of these mitigation proposals can be determined.

During the course of our review we have discussed the project at length with the of the U.S. Fish and Wildlife Service, National Marine Fisheries Service, S.C. Department of Natural Resources and S.C. Department of Health and Environmental Control, water quality section. All have concerns which have been cited at meeting, in comment letters, and through personal communications. These concerns have been well documented in the many comment letters regarding this EIS. We have also heard the concerns related to the Savannah Harbor National Wildlife Refuge and the ability of the staff to effectively deal with the alterations to salinity levels resulting from this project. Alterations in the salinity patterns, directly attributable to harbor channel alterations, have reduced the size of the vital freshwater wetland habitat from over 6,000 acres in 1927, at the time the refuge was established, to approximately 2,800 acres in 1997. This project, if permitted, will result in alterations to an additional 1,170 acres, leaving only 1,600 freshwater wetland acres in the refuge.

OCRM also realizes that the Corps staff has had only limited involvement with the preparation of the EIS document, and that the consistency determination was actually prepared by the consultant of the Georgia Ports Authority, the agency that is funding this endeavor. If this project had been prepared in the usual manner, Corp's personnel would have made these consistency decisions. This approach continues to cause us problems, as the consistency determination for direct federal projects is one made by a federal agency to an approved coastal zone management agency. In this case it is apparent that your staff has had little, if anything, to do with the, preparation of this determination and the resulting finding of no significant impact, which appears to be unsupported by the comment letters of the resource agencies and other involved agencies. In light of the

many serious environment issues that have been raised, now is the time for the Corp's environmental, planning and dredge maintenance personnel to carefully consider the effect that these alterations will have on the estuary and refuse to forward it for further approval until such time as the information gap is answered. The following significant issues have been raised and must be addressed before the project can be found consistent with our coastal management program:

1) The recovery of the freshwater marsh system from previous impacts (tide gate and 42-foot deepening project) and the effects that this action will have on the system.

2) The recovery of the striped bass fishery from previous impacts (tide gate and 42-foot deepening project) and the effects that this action will have on its survival.

3) The life cycle of the endangered shortnose sturgeon within the Savannah River and the, effects that this action will have on its survival.

4) Shoaling location changes and future dredge material disposal impacts to wetlands and other natural areas.

5) The need for evaluation of alternative deepening strategies as to their potential impacts on salinity, dissolved oxygen and wildlife survivability.

6) Navigation concerns relating to the entrance channel and additional beach erosion.

7) Conflicts between the mitigation and management measures committed to and approved for the disposal areas in the Savannah Long Term Maintenance Strategy, including the period of water draw down, rotational use, construction of sites for enhancing shore bird habitat and other measures.

8) Lack of clear and adequate data on contaminant levels in the sediments proposed to be dredged.

The following South Carolina Coastal Zone Management Program general considerations for the evaluation of all projects and resource policies have been identified as those which the EIS and the project fail to meet.

S.C. COASTAL ZONE MANAGEMENT PROGRAM DOCUMENT

Chapter III. Management of Coastal Resources

C. Uses of Management Concern

3. Resource Policies

Guidelines for Evaluation of All Projects

In review and certification of permit applications in the coastal zone, OCRM will be guided by the following general considerations...:

2) The extent to which the project will have adverse impacts on the "critical areas" (beach / dune system, coastal waters, tidelands).

3) The extent to which the project will protect, maintain or improve water quality, particularly in aquatic areas of special resource value, for example, spawning areas or productive oyster beds.

4) The extent to which the Project will meet existing State and Federal requirements for waste discharges specifically point, sources of air and water discharge, and for protection of inland wetlands.

7) The possible long-range, cumulative effects of the project, when reviewed in the context of other possible development and the general character of the area.

8) The extant and significance of negative impacts on Geographic Areas of Particular Concern (GAPCs). The determination of negative impacts will be made by OCRM in each case with reference to the priorities of use for the particular GAPC. Applications which would significantly impact a GAPC will not he approved or certified unless there are no feasible alternatives or an overriding public interest can be demonstrated, and any substantial environmental impact is minimized.

9) The extent and significance of impact on the following aspects of quality or quantity of these valuable coastal resources:

i) unique natural areas -destruction of endangered wildlife or vegetation or of significant marine species (as identified in the Living Marine Resources segment), degradation of existing water quality standards;

ii) public recreational lands - conversion of these lands to other uses without adequate replacement or compensation, interruption of existing public access, or degradation of environmental quality in these areas.

10) The extent to which the project is in the national interest.

In critical areas of the coastal zone, it is OCRM policy that, in determining whether a permit application is approved or denied, OCRM "shall base its determination on the individual merits of each application, the policies specified in Sections 48-39-20 and 48-39-30 (of the Act), and be guided by the following general considerations:

3) The extent to which the applicant's completed project would affect the production of fish, shrimp, oysters, crabs or clams or any marine life or wildlife or other natural resources in a particular area including but not limited to water and oxygen supply.

5) The extent to which the development could affect existing public access to tidal and submerged lands, navigable waters and beaches or other recreational coastal resources.

6) The extent to which the development could affect the habitats for rare and endangered species of wildlife or irreplaceable historic and archeological sites of South Carolina's coastal zone.

8) The extent of any adverse environmental impact which cannot be avoided by reasonable safeguards.

9) The extent to which all feasible safeguards are taken to avoid adverse environmental impact resulting from a project.

Resource Policies

Policy Section VII. Wildlife and Fisheries Management

A. Wildlife and Fisheries Management

1) In the coastal zone, including critical areas, OCRM issuance or review and certification of permit applications which would impact wildlife and fisheries resources will be based on the following policies:

a) Activities deemed, by OCRM in consultation with the South Carolina Department of Natural Resources, to have a significant negative impact on wildlife and fisheries resources, whether it be on the stocks themselves or their habitat, will not be approved unless overriding socio-economic considerations are involved. In reviewing permit applications relative to wildlife and fisheries resources, social and economic as well as biological impacts as well as biological impacts will be considered.

b) Wildlife and fisheries stocks and populations should be maintained in a healthy and viable condition and these resources should be enhanced to the maximum extent possible.

c) Critical wildlife and fisheries habitat should be protected and enhanced to the extent possible.

Policy Section XII, Activities in Areas of Special Resource Significance

C. Navigation Channels

OCRM will consider the following policies in review and certification of permit applications for projects in or directly affecting existing navigation channels:

4) Resource Policies and Rules and Regulations for Permitting which apply to Dredging and Dredge Material Disposal shall be applied.

D. Public Open Space

OCRM will apply the following policies in review and certification of permit applications located in or which would directly affect public open space areas:

1) Project proposals which would restrict or limit the continued use of a recreational open area or disrupt the character of such a natural area (aesthetically or environmentally) will not be certified where other alternatives exist.

Chapter IV - Special Management

A. Geographic Areas of Particular Concern (GAPCs)

2. Geographic Areas

a. Areas of Unique Natural Resource Value

8) Threatened or Endangered Species Habitats

Policy has been affirmed by both the Federal government and State government in South Carolina that conservation of the natural ecosystem upon which endangered and threatened species depend is a high priority. Untempered economic growth and development can result in the depletion r extinction of various species of fish, wildlife and plants. These species of fish, wildlife and plants are of esthetic, ecological, educational, historical, recreational, and scientific value to our people, our Nation, and to the international community.

The United States has committed itself through numerous treaties with other countries to a pledge of conservation involving migratory birds, fisheries and wildlife preservation, for example. The scope of our responsibility as people and a Nation to protect the delicate balance of the natural ecosystem is demonstrated by these treaties of Federal and State legislation. As a result, OCRM will recognize all designated threatened and endangered species habitats as Geographic Areas of Particular Concern.

Management Authority

OCRM is mandated to consider impacts on wildlife species in granting of permits for activities in critical areas of the coastal zone. OCRM will also review and comment on other permits, applications, environmental impact statements and Federally-funded projects (A-95 process) throughout the coastal zone. OCRM comments will include an evaluation of the potential impacts on any designated critical habitats for threatened or endangered species.

b. Activities or Facilities Dependent on Coastal Location

2) Navigation Channels

Priority of Uses - Existing navigation channels should be maintained and utilized, while at the same time conserving the natural environment. The following are the uses of priority for navigation channels in the coastal zone, beginning with the use of highest priority:

1) Beneficial uses which require water access or uses for which the water orientation is the central purpose of the activity, such as maritime shipping, fishing and recreational boating, providing these uses are conducted in such a way as to minimize adverse environmental impacts.

OCRM RULES & REGULATIONS FOR PERMITTING

R.30-12.G.(2)(c) To the maximum extent feasible, dredging and filling activities should be restricted in nursery areas and shellfish grounds and during periods of migration, spawning, and early development of important sport and commercial species.

R.30-12.G.(2)(d) Dredging and excavation shall not create stagnant water conditions, lethal fish entrapments, or deposit sumps or otherwise contribute to water quality degradation.

R.30-12.G.(2)(i) Wetlands shall not be utilized as depositories for waste materials except as discussed in R.30-12(I).

R.30-12.G.(2)(j) In all cases, dredging activities shall not be approved until satisfactory disposal sites have been acquired.

R.30-12.H.(1) Certain dredging activities involve the creation and maintenance of navigation channels and access canals. These activities have a potential for severe environmental impacts and should meet a demonstrated public need.

R.30-12.I.(1) The deposition of dredged materials resulting from numerous dredging activities along the coast has serious environmental effects separate from the original dredging activity. Thousands of acres of productive wetland habitat have been destroyed by such deposition. Recognizing that additional disposal sites will be required, it is important that site acquisition proposals include plans for mitigating any adverse impacts upon the environment.

The previously identified issues must be resolved to the satisfaction of this agency and the resource agencies prior to our approval of any deepening project. We are willing to participate in the preparation of the strategy to continue the restoration and monitoring of the Savannah Harbor system. It is our conclusion that restoration must be completed and, if necessary, enhanced before a deepening alternative at the 50-foot or less depth is approved. The OCRM is hopeful that if a remediation plan is developed and funded as a continuance of this effort, the citizens of both South Carolina and Georgia will have achieved a beneficial result from this project.

Pursuant to 15 CFR.930.110 secretarial mediation through the Secretary of Commerce may be utilized to resolve conflicting issues. If you desire to pursue the mediation process, please contact me so that we may coordinate. The South Carolina Coastal Zone Management Program also provides a means for appeals from staff decisions through the Coastal Zone Appellate Panel. Please contact Ms. Mary D. Shahid, General Counsel, for additional details.

Sincerely,

Robert D. Mikell
Manager, Federal Certification Section

cc: Mr. Christopher L. Brooks
Mr. H. Stephen Snyder
Mr. Myron Yuschishin, Savannah District, USACOE
Mr. Ed Eudaly, U. S. Fish & Wildlife Service
Ms. Priscilla Wendt, S. C. Dept. of Natural Resources
Mr. David Rackley, National Marine Fisheries Service

Coastal Zone Management Program consistency Determination
Office of Ocean and Coastal Resource Management - SCDHEC

Project Name: Savannah Harbor Expansion EIS
Consistency Determination (from Section VI):

Consistent:_____
Inconsistent:_X_____
Consistent with revisions:_____

I. Background information DataBase ID# _28460_____

Permit Number: N/A Federal Consistency_____
P/N Date: May 8, 1998_____ Date Received: _May 12, 1998_____
Date of Publication of Newspaper Notice: N/A_____
Permit Type: Federal Consistency_____ Permit Agency: _____
County: Savannah River Water Body:

Location Description: This project is located in the Savannah River on the South Carolina/Georgia border

II. Brief Project Description:

This project proposes to dredge the Savannah River Channel from station 0+000 to 103+000 down to a depth of -50'. The project length is approximately 36 miles and would deepen the existing channel by 8'.

III. Summary of Public and Agency Comments (List by name, date & comment summary if none, so indicate):

USFWS, 3/26/98. SCDNR, 2/25/98. NMFS, 6/12/98. All commenting agencies express many issues and concerns which need to be adequately addressed. (See detailed comment letter.)

A. (Commentor) (Date of comment) (Comment summary)

IV. Environmental and Policy Assessment:

A. Describe the coastal resources (i.e., vegetation, habitat, etc.) which will be impacted:

Coastal resources which would be impacted by the project include six acres of tidal salt marsh dominated by Spartina alternaflora which would be dredged, thirty-five acres of salt marsh filled, and more than one-thousand acres of freshwater marsh converted to brackish marsh. The freshwater marsh is dominated by a wide variety of plants and animals and is currently recovering after closure of the tide gate at the Back River.

B. What is (are) the purpose(s) of the impact(s) to wetlands or other coastal resources?

The purpose of this project is to allow larger ships to use the Georgia Ports Terminals and to extend the channel farther upstream.

C. Does the project meet Wetland Master Planning Policy (explain)?

No.

D. Does the project demonstrate no feasible alternatives or overriding public interest (explain)?

No. The only option fully modeled and analyzed in the EIS was to deepen the channel to -50'. Alternatives of lesser depths were not modeled and evaluated for impacts to water quality, wetland conversion or similar impacts. Projected impacts for the 2', 4', and 6' options must be addressed in the EIS to make any determination of feasibility. In addition, public trust resources, including endangered species, would likely be negatively impacted by the project. An overriding public interest exists in protecting public trust resources.

E. Does the project impact a GAPC (if so, describe)?

Yes. This project would impact federally listed endangered species (shortnose sturgeon), critical fisheries habitat, by increasing salinities and/or lowering dissolved oxygen concentrations in critical sections of the river including spawning areas. Also, the navigation channel and several properties listed or eligible for listing on the National Register of Historic Places would be impacted by this project.

F. Is a dock master plan required (if so, why)?

No.

G. Has the project been modified to minimize impacts (if so, describe)?

No minimization has been proposed for this project. The construction would significantly deepen the existing channels and result in a wider channel especially along the turning points of the channel. There are also likely to be areas of increase bank erosion, resulting

from use by larger ships. Also there will be changes in the shoaling patterns of the harbor requiring the construction of new dredged material disposal basins and other impacts not addressed as primary or secondary impacts in the EIS.

H. Is mitigation required and, if so, does it meet CAM policy (describe)?

Yes. The proposed mitigation for this project is not consistent with the SCCZMP. This project would result in functional changes of a very large area of wetland and could not be mitigated through the preservation of other wetlands as proposed. Mitigative measures which would replace lost functions and restore the viability, and health of the fisheries and estuary would be required for this project.

Does the project contravene any coastal zone management policy? _X__ Yes ___ No

(if No, skip to section VI; if Yes, complete Section VI.)

V. For projects inconsistent with the SCCMP:

A. The project is inconsistent with the following policies:

S. C. Coastal Zone Management Program, Chap. III, C, (3) Guidelines for Evaluation of All Projects., 1), 2), 3), 4), 7), 8), ((I), 9(ii), 10 and 11, 3), 5), 6), 8), 9); Chap. III, Policy Section VII, A, (1)(a), (b), (c); Chap. III, Policy Section XII, C, (4), XII, D, (1), Chap. IV, A, (2)(a)8); Chap. IV, A, (2)(b)2), OCRM Rules & Regulations for Permitting, R.30-12G.(2)(c),(d),(j),(l); R.30-12.H.(1); R.30-12.1.(1)

B. Specific reason(s) project is inconsistent:

This project is inconsistent with the SCCZMP because it would result in the permanent destruction of 41 acres of productive wetlands, the conversion of at least 1,150 acres of freshwater marsh to brackish marsh, the loss of critical fisheries habitat, and the degradation of endangered species habitat, lowering of water quality, impacts to historic resources as well as many unaddressed secondary impacts.

C. Modifications for bringing the project into consistency:

This project may be made consistent by providing more accurate information on the Savannah Harbor estuary, including the options of the 2', 4', and 6' deepening scenarios. Any deepening project must first proceed with implementation of a restoration strategy for wetland vegetation changes and by the elimination of impacts to critical fisheries and endangered species habitats. The concurrence of the resource agencies that the estuary is recovering must be realized before any deepening can proceed.

VI. Staff Consistency Determination

VII. Summary of coastal zone Impacts and mitigation

A. Wetlands

1. total wetland impacts requested: 1,191 (ac(
2. Total wetland impacts allowed: 0.0 (ac)
3. Type of impacts allowed (in acres): (a) _____ fill; (b) _____ dredge;
(c) _____clear; (d) _____ impound; (e) _____ drain; (f) 1,191 other

B. Mitigation

1. Total mitigation: _____(ac)
2. Type and size of mitigation (in acres) (a) _____ upland buffers; (b) _____
wetland preservation; (c) _____ restoration/enhancement;
(d) _____ creation; (e) other: _____
3. Location:
(a) _____ onsite
(b) _____ offsite, (non-bank), located at _____
(c) _____ offsite, (mitigation bank) _____

VIII. Field assessment by: David J. Thompson Date: _____

IX. Staff consistency recommendation by: David J. Thompson 6/18/98

(Name) (Date)

X. Approved by:

1. Freshwater Wetland Coordinator: D. J. Thompson (signed) 7/2/98

2. Fed. Certification Section Director (signed) 7/1/98

XI. Notes: This project, as currently described and designed in the EIS, is not consistent with the SCCZMP

Letter response

Office of Ocean and Coastal Resource Management
S.C. Department of Health and Environmental Control
1362 McMillan Avenue, Suite 400
Charleston, SC 29405

Date: July 2, 1998

1. COMMENT: Our conclusion is that the project is inconsistent with the policies of the South Carolina CZM Program. During our review of this project we have remained in close contact with the different resource agencies that are also responsible for the management of this area. Our concerns have been addressed previously in our June 4, 1998, letter which requests additional time and information to fully understand the issues and problems involved with this project.

RESPONSE: The Public Comment period was extended by 15 days to 7 July 1998. In addition, further studies will be performed in the CED phase to develop a final mitigation plan, which would be subject to a Tier II EIS.

2. COMMENT: The impacts of this proposal would have significant and possibly irreversible environmental impacts on the Savannah Harbor estuary. These impacts include the conversion of 1,170 acres of freshwater marsh system to a brackish system, lowered D.O. levels, increased turbidity and continued harm to the striped bass and shortnose sturgeon fisheries of the Savannah River. The EIS also cannot predict to a level of accuracy agreeable to the resource agencies, the impact of deepening the channel on many interdependent and related issues, including water quality, wetlands, fisheries, wildlife, shoreline erosion, the management of dredged material and GAPCs. The ability to accurately predict these impacts is complicated by the estuary's ability to compensate for the many man-made alterations that have previously impacted the harbor area. As a result of these alterations, the present condition of the harbor is one characterized by low levels of D.O., high turbidity, and unnatural salinity distribution patterns. These have resulted in habitat loss or almost complete destruction of a once-healthy fishery. There were also concerns cited about the failure of the EIS to fully model and analyze the impacts of shallower deepening alternatives that would have lesser impact on the Savannah Harbor system. It is the common concern of all agencies involved in the review of this project that these alterations to this harbor, when so many previous alterations have taken place, could well be those which preclude recovery of the estuary.

RESPONSE: The value of these resources is recognized in the DEIS. The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

3. COMMENT: Several mitigation proposals have been identified, each of which seems to offer new problems to the restoration of this estuary. These options raise additional questions and will require a great deal more investigation so that they do not further exacerbate the existing condition of the harbor. Again, the selection of a suitable option proved most difficult because of a lack of understanding of the environmental alterations resulting from past modifications and the interconnections between the three rivers. A much more thorough study of the effects of these past modifications and the impacts of any deepening proposal will require much more examination before the success of these mitigation proposals can be determined.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

4. COMMENT: During the course of our review we have discussed the project at length with the USFWS, NMFS, SCDNR and SCDHEC (water quality section). All have concerns that have been cited at meetings, in comment letters, and through personal communications. These concerns have been well documented in the many comment letters regarding this EIS. We have also heard the concerns related to the Savannah NWR and the ability of the staff to effectively deal with the alterations to salinity levels resulting from this project. Alterations in the salinity patterns, directly attributable to harbor channel alterations, have reduced the size of the vital freshwater wetland habitat from over 6,000 acres in 1927, at the time the refuge was established, to approximately 2,800 acres in 1997. This project, if permitted, will result in alterations to an additional 1,170 acres, leaving only 1,600 freshwater wetland acres in the refuge.

RESPONSE: the surface salinity will be greater than 0.5 ppt. The other 50 percent of the time, the salinity will be less than 0.5 ppt. The 50 percentile salinity at 8,200 cfs was used as representative of an average condition that may be expected and was the subject of long discussion among the technical advisory group. While the 1,170 acre zone will be subject more frequently to salinities higher than 0.5 ppt, it is inappropriate to state that 1,170 acres of tidal freshwater marsh will be lost. Under various tide and river flow conditions, the area within the 1,170 acre zone certainly is already subjected to salinity levels above 0.5 ppt. The long-term effect the post-project change in salinity level frequency will have on the vegetative composition of the tidal freshwater marshes is a ripe subject for further study. Whatever the salinity effect may be, it is more likely to manifest itself as a subtle, long-term change than a conveniently quantifiable wholesale conversion of tidal freshwater marsh into an intermediate marsh. In addition, any changes in the marsh composition as a result of post-project induced salinity changes would occur against the backdrop of "natural" changes that would be occurring within the marshes even in the absence of the port project. Under no scenario would any tidal freshwater marsh be converted into saltwater marsh. In the next phase of the project it is proposed that the potential long-term effect of salinity values on marsh composition be more thoroughly studied. This study would include deployment of a network of salinity data loggers within the marsh and tidal channels to more precisely monitor the magnitude and variation of salinity values within the marshes. This study would be augmented with additional studies of other factors affecting marsh

succession including substrate variability and water levels. These studies would be used to support development of a dynamic marsh succession model for use as a predictive and management tool.

5. COMMENT: The finding of no significant impact appears to be unsupported by the comment letters of the resource agencies and other involved agencies. In light of the many serious environment issues that have been raised, now is the time for the Corp's environmental, planning and dredge maintenance personnel to carefully consider the effect that these alterations will have on the estuary and refuse to forward it for further approval until such time as the information gap is answered. The following significant issues have been raised and must be addressed before the project can be found consistent with our coastal management program:

1) The recovery of the freshwater marsh system from previous impacts (tide gate and 42-foot deepening project) and the effects that this action will have on the system.
2) The recovery of the striped bass fishery from previous impacts (tide gate and 42-foot deepening project) and the effects that this action will have on its survival.
3) The life cycle of the endangered shortnose sturgeon within the Savannah River and the, effects that this action will have on its survival.
4) Shoaling location changes and future dredge material disposal impacts to wetlands and other natural areas.
5) The need for evaluation of alternative deepening strategies as to their potential impacts on salinity, dissolved oxygen and wildlife survivability.
6) Navigation concerns relating to the entrance channel and additional beach erosion.
7) Conflicts between the mitigation and management measures committed to and approved for the disposal areas in the Savannah Long Term Maintenance Strategy, including the period of water draw down, rotational use, construction of sites for enhancing shore bird habitat and other measures.
8) Lack of clear and adequate data on contaminant levels in the sediments proposed to be dredged.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

6. COMMENT: The following South Carolina Coastal Zone Management Program general considerations for the evaluation of all projects and resource policies have been identified as those which the EIS and the project fail to meet.

C. Uses of Management Concern

3. Resource Policies

Guidelines for Evaluation of All Projects

In review and certification of permit applications in the coastal zone, OCRM will be guided by the following general considerations...:

2) The extent to which the project will have adverse impacts on the "critical areas" (beach/dune system, coastal waters, tidelands).

3) The extent to which the project will protect, maintain or improve water quality, particularly in aquatic areas of special resource value, for example, spawning areas or productive oyster beds.

4) The extent to which the Project will meet existing State and Federal requirements for waste discharges specifically point, sources of air and water discharge, and for protection of inland wetlands.

7) The possible long-range, cumulative effects of the project, when reviewed in the context of other possible development and the general character of the area.

8) The extant and significance of negative impacts on Geographic Areas of Particular Concern (GAPCs). The determination of negative impacts will be made by OCRM in each case with reference to the priorities of use for the particular GAPC. Applications which would significantly impact a GAPC will not he approved or certified unless there are no feasible alternatives or an overriding public interest can be demonstrated, and any substantial environmental impact is minimized.

9) The extent and significance of impact on the following aspects of quality or quantity of these valuable coastal resources:

i) unique natural areas -destruction of endangered wildlife or vegetation or of significant marine species (as identified in the Living Marine Resources segment), degradation of existing water quality standards;

ii) public recreational lands - conversion of these lands to other uses without adequate replacement or compensation, interruption of existing public access, or degradation of environmental quality in these areas.

10) The extent to which the project is in the national interest.

In critical areas of the coastal zone, it is OCRM policy that, in determining whether a permit application is approved or denied, OCRM "shall base its determination on the individual merits of each application, the policies specified in Sections 48-39-20 and 48-39-30 (of the Act), and be guided by the following general considerations:

3) The extent to which the applicant's completed project would affect the production of fish, shrimp, oysters, crabs or clams or any marine life or wildlife or other natural resources in a particular area including but not limited to water and oxygen supply.

5) The extent to which the development could affect existing public access to tidal and submerged lands, navigable waters and beaches or other recreational coastal resources.

6) The extent to which the development could affect the habitats for rare and endangered species of wildlife or irreplaceable historic and archeological sites of South Carolina's coastal zone.

8) The extent of any adverse environmental impact which cannot be avoided by reasonable safeguards.

9) The extent to which all feasible safeguards are taken to avoid adverse environmental impact resulting from a project.

Resource Policies

Policy Section VII. Wildlife and Fisheries Management

A. Wildlife and Fisheries Management

1) In the coastal zone, including critical areas, OCRM issuance or review and certification of permit applications which would impact wildlife and fisheries resources will be based on the following policies:

a) Activities deemed, by OCRM in consultation with the South Carolina Department of Natural Resources, to have a significant negative impact on wildlife and fisheries resources, whether it be on the stocks themselves or their habitat, will not be approved unless overriding socio-economic considerations are involved. In reviewing permit applications relative to wildlife and fisheries resources, social and economic as well as biological impacts as well as biological impacts will be considered.

b) Wildlife and fisheries stocks and populations should be maintained in a healthy and viable condition and these resources should be enhanced to the maximum extent possible.

c) Critical wildlife and fisheries habitat should be protected and enhanced to the extent possible.

Policy Section XII, Activities in Areas of Special Resource Significance

C. Navigation Channels

OCRM will consider the following policies in review and certification of permit applications for projects in or directly affecting existing navigation channels:

4) Resource Policies and Rules and Regulations for Permitting which apply to Dredging and Dredge Material Disposal shall be applied.

D. Public Open Space

OCRM will apply the following policies in review and certification of permit applications located in or which would directly affect public open space areas:

1) Project proposals which would restrict or limit the continued use of a recreational open area or disrupt the character of such a natural area (aesthetically or environmentally) will not be certified where other alternatives exist.

Chapter IV - Special Management

A. Geographic Areas of Particular Concern (GAPCs)

2. Geographic Areas

a. Areas of Unique Natural Resource Value

8) Threatened or Endangered Species Habitats

Policy has been affirmed by both the Federal government and State government in South Carolina that conservation of the natural ecosystem upon which endangered and threatened species depend is a high priority. Untempered economic growth and development can result in the depletion r extinction of various species of fish, wildlife and plants. These species of fish, wildlife and plants are of

esthetic, ecological, educational, historical, recreational, and scientific value to our people, our Nation, and to the international community.

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Management Authority

OCRM is mandated to consider impacts on wildlife species in granting of permits for activities in critical areas of the coastal zone. OCRM will also review and comment on other permits, applications, environmental impact statements and Federally-funded projects (A-95 process) throughout the coastal zone. OCRM comments will include an evaluation of the potential impacts on any designated critical habitats for threatened or endangered species.

b. Activities or Facilities Dependent on Coastal Location

2) Navigation Channels

Priority of Uses - Existing navigation channels should be maintained and utilized, while at the same time conserving the natural environment. The following are the uses of priority for navigation channels in the coastal zone, beginning with the use of highest priority:

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OCRM RULES & REGULATIONS FOR PERMITTING

R.30-12.G.(2)(c) To the maximum extent feasible, dredging and filling activities should be restricted in nursery areas and shellfish grounds and during periods of migration, spawning, and early development of important sport and commercial species.

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R.30-12.G.(2)(j) In all cases, dredging activities shall not be approved until satisfactory disposal sites have been acquired.

R.30-12.H.(1) Certain dredging activities involve the creation and maintenance of navigation channels and access canals. These activities have a potential for severe environmental impacts and should meet a demonstrated public need.

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The previously identified issues must be resolved to the satisfaction of this agency and the resource agencies prior to our approval of any deepening project. We are willing to participate in the preparation of the strategy to continue the restoration and monitoring of the Savannah Harbor system. It is our conclusion that restoration must be completed and, if necessary, enhanced before a deepening alternative at the 50-foot or less depth is approved. The OCRM is hopeful that if a remediation plan is developed and funded as a continuance of this effort, the citizens of both South Carolina and Georgia will have achieved a beneficial result from this project.

Pursuant to 15 CFR.930.110 secretarial mediation through the Secretary of Commerce may be utilized to resolve conflicting issues. If you desire to pursue the mediation process, please contact me so that we may coordinate. The South Carolina Coastal Zone Management Program also provides a means for appeals from staff decisions through the Coastal Zone Appellate Panel.

RESPONSE: The EIS has adequately addressed the issues listed for feasibility study purposes. Further detailed evaluations will be performed to develop a final mitigation plan, which will be subject to a Tier II EIS. A consistency determination will be required from SC before construction.

Water Quality Certification, Standards and Wetlands Programs Branch

DHEC

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, SC 29201-1708

COMMISSIONER:
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Rodney L. Grandy

July 1, 1998

Savannah District, Corps of Engineers
Environmental Resources Branch, Planning Division
Attn: Mr. William G. Bailey
P.O. Box 889
Savannah, GA 29202

RE: Georgia Ports Authority; Savannah Harbor Expansion Draft EIS
401 Water Quality Certification Request

Dear Mr. Bailey:

We have received the above referenced Public Notice and request for 401 Water Quality Certification. The Department has issued 401 Water Quality Certifications authorizing dredging and the use of South Carolina disposal areas in the Savannah Harbor Area. The most recent certification authorizing the Long Term Management Strategy (LTMS) was issued on May 10, 1996. More recently the COE requested a 401 Water Quality Certification for advanced maintenance dredging in the Savannah Harbor in a Joint Public Notice issued on December 22, 1997. This work also involved navigation channel deepening (beyond depths authorized in the LTMS) in 2 areas of the Savannah River and disposal of dredged material in CDF 14B and on Jones Oysterbed

Island. After reviewing elutriate data, the Department determined that the proposed work would not contravene water quality standards, was consistent with the 401 Water Quality Certification issued for the LTMS, and could be approved as a modification of that project. As described in the public notice, the current project proposal is much larger in scope and indicates potential adverse water quality impacts (e.g., permanently lowered D.O. levels and changes in salinity) and associated ecological consequences (e.g., freshwater wetlands impacts and reduction of endangered species habitat) not identified in the LTMS. Therefore, the Department must issue a separate 401 Water Quality Certification decision for the currently proposed work.

Please find attached the 401 Water Quality Certification processing fee and public notice requirements for the above referenced certification request. The 401 Water Quality Certification process will require an evaluation of potential water quality and ecological impacts resulting from dredging and effluent from disposal areas to determine if water quality standards and classified uses of the Savannah River, Back River, and Little Back River will be maintained. This process also requires the Department to evaluate alternatives which could accomplish the project objectives with less adverse impact to water quality. After reviewing the application, we have determined that information provided in the Draft Savannah Harbor EIS is not sufficient to adequately evaluate proposed impacts to water quality. Although this Draft EIS provides information valuable in identifying potential project impacts, it is not complete in addressing project alternatives or adequately assessing adverse impacts and mitigation. It is also suggested that information in the Final EIS be presented in a more organized and useable format. This would include reference to page numbers for figures and tables, identification of water bodies and locations when referring to stations, and more complete numerical summaries of data discussed in the results.

The following additional information and data summaries will he required for the Department to proceed with the 401 Water Quality Certification Process:

- Final calibration of the D.O. and salinity models and presentation of results predicting project impacts.

- A detailed analysis of deepening depth alternatives (incremental deepening options as addressed in the engineering and economic analyses) relative to D.O. impacts, salinity impacts, and wetlands impacts.

- Potential wetland acreages impacted by changes in salinities are discussed in the Draft EIS. More accurate estimates of the extent and location of wetlands impacts needs to be provided to evaluate alternatives and appropriate mitigation.

- Model results addressing salinity and D.O. impacts associated with closing off Middle River.

- A summary of sediment elutriate data addressing material that will be placed in CDF's located in South Carolina and mixing zone dimensions.

- Changes in management of CDF's in South Carolina, or construction of any new CDF's in South Carolina associated with the proposed work.

- The Department will need to review the Final EIS before making a 401 Water Quality Certification decision.

Since these issues are not adequately addressed in the Draft EIS, we will not be able to make a 401 Water Quality Certification decision at this time. We suggest withdrawing your application for 401 Water Quality Certification and resubmitting it when the additional information is available and the Final EIS is completed.

If you wish to proceed with the application at this point, additional information not included above may be required by the Department during evaluation of this project. Information requested must be submitted before a technical review of this project application can be completed. Pursuant to R. 61-30 the Department has 180 days to complete action on an application for 401 Water Quality Certification or the assessed fee must be returned. This 180 days includes only those days in which the application is actively being reviewed by the Department; the clock stops when information is requested and the Department is waiting on a response. Please call Mark Giffin at 734-5302 if you have any questions.

Sincerely,

M. Rheta Geddings, Manager

Water Quality Certification, Standards
and Wetlands Programs Section

CC: Rob Mikell, OCRM

Letter response

DHEC

South Carolina Department of Health and Environmental Control
Water Quality Certification, Standards and Wetlands Programs Section
2600 Bull Street
Columbia, SC 29201-1708

Date: July 1, 1998

1. COMMENT: As described in the public notice, the current project proposal is much larger in scope and indicates potential adverse water quality impacts (e.g., permanently lowered D.O. levels and changes in salinity) and associated ecological consequences (e.g., freshwater wetlands impacts and reduction of endangered species habitat) not identified in the LTMS. Therefore, the Department must issue a separate 401 Water Quality Certification decision for the currently proposed work.

RESPONSE: GPA recognizes that water quality certification must be received for this project.

2. COMMENT: After reviewing the application, we have determined that information provided in the Draft EIS is not sufficient to adequately evaluate proposed impacts to water quality. Although this Draft EIS provides information valuable in identifying potential project impacts, it is not complete in addressing project alternatives or adequately assessing adverse impacts and mitigation. It is also suggested that information in the Final EIS be presented in a more organized and useable format. This would include reference to page numbers for figures and tables, identification of water bodies and locations when referring to stations, and more complete numerical summaries of data discussed in the results.

RESPONSE: Additional information will be developed during the CED phase of the project and will be provided to SC DHEC at that time. GPA recognizes that water quality certification must be received from SC DHEC before any dredging included in this harbor improvement project could be performed. GPA intends to work with DHEC to provide the information needed by that agency to make their determination of the acceptability of this project.

3. COMMENT: The following additional information and data summaries will he required for the Department to proceed with the 401 Water Quality Certification Process:

- Final calibration of the D.O. and salinity models and presentation of results predicting project impacts.
- A detailed analysis of deepening depth alternatives (incremental deepening options as addressed in the engineering and economic analyses) relative to D.O. impacts, salinity impacts, and wetlands impacts.

- Potential wetland acreages impacted by changes in salinities are discussed in the Draft EIS. More accurate estimates of the extent and location of wetlands impacts needs to be provided to evaluate alternatives and appropriate mitigation.
- Model results addressing salinity and D.O. impacts associated with closing off Middle River.
- A summary of sediment elutriate data addressing material that will be placed in CDF's located in South Carolina and mixing zone dimensions.
- Changes in management of CDF's in South Carolina, or construction of any new CDF's in South Carolina associated with the proposed work.
- The Department will need to review the Final EIS before making a 401 Water Quality Certification decision.

RESPONSE: GPA intends to work with DHEC to provide the information they need to make their determination of the acceptability of this project. This information will be developed during the CED phase of the project and will be provided to SC DHEC at that time.

4. COMMENT: Since these issues are not adequately addressed in the Draft EIS, we will not be able to make a 401 Water Quality Certification decision at this time. We suggest withdrawing your application for 401 Water Quality Certification and resubmitting it when the additional information is available and the Final EIS is completed.

RESPONSE: As SC DHEC suggests, GPA intends to withdraw the application for certification for this project until it develops the requested information and can provide it to SC DHEC for review. This information will be developed during the CED phase of the project.

June 1, 1998

South Carolina Archives & History Center
History & Heritage For All Generations

Mr. William G. Bailey
Environmental Resources Branch
Planning Division
Savannah District Corps of Engineers
PO Box 889
Savannah, Georgia 31402-0889

Re: Savannah Harbor Expansion Draft Environmental Impact Statement
And Feasibility Report for Savannah Harbor Expansion

Dear Mr. Bailey:

I'm responding to Mr. M. J. Yuschisin's letter of May 6 regarding the proposed Draft Environmental Impact Statement (DEIS) and Feasibility Report for the Savannah Harbor Expansion.

The stipulations for the treatment of cultural resources affected by the harbor expansion are outlined in the Programmatic Memorandum of Agreement entered into by the Corps of Engineers, the Advisory Council on Historic Preservation, the SC State Historic Preservation Office, and the Georgia Historic Preservation Office. This unsigned document is included as an appendix in Enclosure F. The final signed copy of the Programmatic Agreement should be included in the final Environmental Impact Statement.

This also applies to the referenced Memorandum of Agreement for the New Cut Closure Project and the CSS Georgia. Final signed copies of the memoranda should be included in the final Environmental Impact Statement.

If you have questions, please don't hesitate to call me at 803/896-6169.

Sincerely,

Nancy Brock, Coordinator
Review and Compliance Programs
State Historic Preservation Office

S. C. Department of Archives & History
8301 Parklane Road - Columbia - South Carolina - 29223-4905
(803) 896-6100

Letter response

SC. Department of Archives and History

State Historic Preservation Office
8301 Parklane Road
Columbia, SC 292223-4905

DATE: June 1, 1998

COMMENT: The stipulations for treatment of cultural resources affected by the project are outlined in the draft PMOA that was included in the DEIS. A signed copy of the PMOA and MOAs for the CSS Georgia and New Cut Closure Project should be included in the FEIS.

RESPONSE: Signed copies of the PMOA and the MOA for the New Cut Closure Project are included in the FEIS. The process of obtaining signatures on the MOA for the CSS Georgia is still underway.

Local Government

Chatham County

COMMISSIONERS OF CHATHAM COUNTY
CHATHAM COUNTY COURTHOUSE **http://www.co.chatham.ga.us/manager**
124 BULL STREET
P.0. Box 8161
SAVANNAH, GEORGIA 31412
(912) 652-7869 VOICE
(912) 652-7874 FAX

DR. BILLY B. HAIR
Chairman

DR. PRISCILLA D. THOMAS
District 8
Vice Chairman

FRANK G. MURRAY
District 4
Chairman Pro-tem

DAVID L. SAUSSY
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JOE MURRAY RIVERS
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District 3

HARRIS ODELL, JR.
District 5

BEN PRICE
District 6

EDDIE W. DELOACH
District 7

R. E. ABOLT
County Manager

R. JONATHAN HART
County Attorney

SYBIL E. TILLMAN
County Clerk

July 1, 1998

Colonel Joseph Schmitt
U.S. Army Corps of Engineers
P.0. Box 889
Savannah, Georgia 31402-0889

SUBJECT: Comments on the Savannah Harbor Expansion Draft Environmental

Impact Statement (EIS) and Draft Feasibility Report

Dear Colonel Schmitt:

Based on our review of the Savannah Harbor Expansion Draft EIS and Draft Feasibility Report we do not believe that the issue of Local Sponsor for the Savannah Harbor has been adequately addressed. The U. S. Army Corps of Engineers (COE), Georgia Ports Authority (GPA), and Georgia Department of Transportation (GDOT) have been advised that Chatham County will divest itself of responsibilities as a Local Sponsor (a/k/a Local Assurer) next year. Representatives from GPA agreed to take the lead in the Local Sponsor issue and bring this matter before the members of the Authority in July, 1998. Prior to the July meeting with members of the Authority, GPA was to meet with GDOT to seek help over the continuance of a funded line item in the state budget for disposal area construction and maintenance. It is our understanding that the HQUSACE guidance manual advocates that in the event no party identifies itself as sponsor prior to the Savannah Harbor Expansion, then the sponsor of the Expansion project becomes the new sponsor for the entire harbor.

Chatham County staff concurs with the comments submitted by the GDOT, letter dated June 15, 1998. If there are any questions, please have your staff contact Mr. William L. Simmons at 912-652-7808.

R. E. Abolt

cc: A. G. Bungard, P.E., County Engineer

Letter response

COMMISSIONERS OF CHATHAM COUNTY
CHATHAM COUNTY COURTHOUSE
124 BULL STREET
P.0. Box 8161
SAVANNAH, GEORGIA 31412

Date: July 1, 1998

1. COMMENT: We do not believe that the issue of Local Sponsor for the Savannah Harbor has been adequately addressed. The Corps, GPA and GADOT have been advised that Chatham County will divest itself of responsibilities as a Local Sponsor (a/k/a Local Assurer) next year. Representatives from GPA agreed to take the lead in the Local Sponsor issue and bring this matter before the members of the Authority in July, 1998. Prior to the July meeting with members of the Authority, GPA was to meet with GADOT to seek help over the continuance of a funded line item in the state budget for disposal area construction and maintenance. It is our understanding that the HQUSACE guidance manual advocates that in the event no party identifies itself as sponsor prior to the Savannah Harbor Expansion, then the sponsor of the Expansion project becomes the new sponsor for the entire harbor.

RESPONSE: GPA intends to sign the PCA for the proposed improvement project and serve as the non-Federal sponsor. At the present time, GPA intends to abide by the policies contained in the Corps PGL 47 which specifies the responsibilities of a non-Federal sponsor for a Federal Navigation Project. The full ramifications of that PGL are not completely known at this time. It may be that GPA's sponsorship of this improvement results in its assuming all the responsibilities of the non-Federal sponsors of all previous Federal authorizations for the Savannah Harbor Navigation Project. Those ramifications will be clear before GPA signs the PCA.

2. COMMENT: Chatham County staff concurs with the comments submitted by the GADOT in a letter dated June 15, 1998.

RESPONSE: No response necessary.

City of Savannah (June 7)

CITY OF SAVANNAH -- Office of the City Manager
P.O. Box 1027 Savannah, Georgia 31402
912-65 1-6415 ** FAX 912 238-0872

June 7, 1998

Mr. Myron Yuschishin
Department of the Army
Corps of Engineers
Savannah District
P.O. Box 889
Savannah, Georgia 31402-0889

RE: Savannah Harbor; Draft Feasibility Report

Dear Mr. Yuschishin:

As requested, comments dated June 12, 1998 were offered concerning the Draft Environmental Impact Statement. Based on further review of the Draft Feasibility Report and the many meetings held over the past several weeks, the City of Savannah would like to offer the following additional comments.

Section 6.3.2

1) The Feasibility Study states "The City estimated this would cost $25,000,000, which is equivalent to $1,840,000 annually."

It should be clearly understood that the referenced estimate was made only as a part of general discussion and was not intended to be used or included in the Feasibility Study in this manner. Upon further review, but without benefit of any engineering or environmental investigation such a relocation of the raw water intake has been very roughly estimated to be $46,000,000. Therefore, all references to this alternative should be modified accordingly.

Sections 6.3.2 and 7.6.2

2) The Feasibility Study states "Any improvements or modifications required by an increase in chloride levels would not be a project cost. The cost to protect the water intake was used in determining the National Economic Development (NED) Plan. … For Plan formulation purposes only, it was assumed that relocation of the water intake would be

the preferred option." (Section 6.3.2). This is not a project cost; it is used in determining the National Economic Development (NED) Plan." (Section7.6.2)

Structuring the Feasibility Study in this manner coupled with the statement of the Environmental Impact Statement that "the City does not have a compensable property interest under the Fifth Amendment in the chloride level of the water" can only lead to the conclusion that a degradation in the water quality, on which the City has come to rely for over 50 years, has a negative financial impact with respect to National Economic Development and the responsibility and costs for any required mitigation will be the responsibility of the City of Savannah.

Unfortunately, the structure and wording of these reports leaves the City of Savannah with no assurance that mitigation measures will in fact be funded or take place. In fact, the text of these reports specifically state that the mitigation measures are not included. This position is completely unacceptable. Therefore, the City requests that Table 6-2, as well as any other relative texts and/or tables, of the Final Feasibility Report be modified to include separate mitigation and distinct line items as follows:

1)	Water Intake Relocation	$46,000,000
2)	Reaeration of River Channel	$24,000,000

The City also requests that all language throughout both the Final Environmental Impact Statement and the Final Feasibility Study be modified to reflect the clear and complete inclusion of these mitigation requirements into the project costs and that all existing language to the contrary be removed.

In addition, several discussions have taken place regarding a "Supplemental Environmental Impact Statement". It is our understanding that the purpose of the Supplemental Environmental Impact Statement is to complete additional studies regarding decreased dissolved oxygen and the potential for increased chlorides as a result of the proposed project. The City requests that the Final Environmental Impact Statement make clear and specific reference to the development of a Supplemental Environmental Impact Statement and that City representatives will be consulted in the development of its scope.

The City of Savannah understands and appreciates the significant role and contribution of the Georgia Ports Authority to the local, regional, and national economies. It is very much the desire of the City of Savannah to see this project move forward such that the Georgia Ports Authority remains one of the world's leading seaports. The City also understands that many of the details concerning exact impacts, and necessary mitigation will not be known until the design phase of the project can commence. Therefore, with inclusion in the Final Environmental Impact Statement and Final Feasibility Study of the mitigation and Supplemental Environmental Impact Statement as specified herein, the City of Savannah stands in support of moving forward with the project.
If we can be of any assistance regarding these or other concerns, please contact us.

Sincerely,

Michael Brown
City Manager

cc: File

Letter response

CITY OF SAVANNAH
Office of the City Manager
P.O. Box 1027
Savannah, Georgia 31402

Date: June 7, 1998

1. COMMENT: Section 6.3.2 - The Feasibility Study states "The City estimated this would cost $25,000,000, which is equivalent to $1,840,000 annually." It should be clearly understood that the referenced estimate was made only as a part of general discussion and was not intended to be used or included in the Feasibility Study in this manner. Upon further review, but without benefit of any engineering or environmental investigation such a relocation of the raw water intake has been very roughly estimated to be $46,000,000. Therefore, all references to this alternative should be modified accordingly.

RESPONSE: The estimated project cost for mitigating impacts to the City's water supply has been increased according to the information submitted by the City.

2. COMMENT: Section 6.3.2 and 7.6.2 - The Feasibility Study states "Any improvements or modifications required by an increase in chloride levels would not be a project cost. The cost to protect the water intake was used in determining the National Economic Development (NED) Plan. … For Plan formulation purposes only, it was assumed that relocation of the water intake would be the preferred option." (Section 6.3.2). This is not a project cost; it is used in determining the National Economic Development (NED) Plan." (Section7.6.2)

Structuring the Feasibility Study in this manner coupled with the statement of the EIS that "the City does not have a compensable property interest under the Fifth Amendment in the chloride level of the water" can only lead to the conclusion that a degradation in the water quality has a negative financial impact with respect to NED and the responsibility and costs for any required mitigation will be the responsibility of the City of Savannah.

Unfortunately, the structure and wording of these reports leaves the City of Savannah with no assurance that mitigation measures will in fact be funded or take place. In fact, the text of these reports specifically state that the mitigation measures are not included. This position is completely unacceptable. Therefore, the City requests that ble 6-2, as well as any other relative texts and/or tables, of the Final Feasibility Report be modified to include separate mitigation and distinct line items as follows:

Water Intake Relocation	$46,000,000

Reaeration of River Channel $24,000,000

The City also requests that all language throughout both the FEIS and the Final Feasibility Study be modified to reflect the clear and complete inclusion of these mitigation requirements into the project costs and that all existing language to the contrary be removed.

RESPONSE: The EIS will be revised to include further studies of the cause and effect relationship between salinity increases from the project and chloride levels at the City's water intake. The project will also include costs for the potential mitigation efforts resulting from an increase in chlorides. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

3. COMMENT: In addition, several discussions have taken place regarding a "Tier II EIS". It is our understanding that the purpose of the Tier II EIS is to complete additional studies regarding decreased D.O. and the potential for increased chlorides as a result of the proposed project. The City requests that the Final EIS make clear and specific reference to the development of a Tier II EIS and that City representatives will be consulted in the development of its scope.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. GPA will coordinate the development and implementation of these studies with the City of Savannah and other stakeholders.

4. COMMENT: The City understands and appreciates the significant role and contribution of GPA to the local, regional, and national economies. It is very much the desire of the City to see this project move forward such that GPA remains one of the world's leading seaports. The City also understands that many of the details concerning exact impacts, and necessary mitigation will not be known until the design phase of the project can commence. Therefore, with inclusion in the Final EIS and Final Feasibility Study of the mitigation and Tier II EIS as specified herein, the City stands in support of moving forward with the project.

RESPONSE: GPA appreciates the City’s recognition of the value of the Port in the community and their support for this improvement project.

City of Savannah (June 12)

CITY OF SAVANNAH

Office of the City Manager

P.O. Box 1027
Savannah, Georgia 31402
912-651-6415 FAX 912-238-0872

June 12, 1999

Mr. Myron Yuschishin
Department of the Army
Corps of Engineers
Savannah District
Post Office Box 889
Savannah, GA 31402-0889

RE: **Savannah Harbor - Draft Environmental Impact Statement**

Dear Mr. Yuschishin:

The City of Savannah appreciates the opportunity to have been involved with the study efforts associated with this project. We also appreciate this opportunity to comment on the Environmental Impact Statement draft report. As requested in your letter of May 6, 1998, staff has reviewed the draft report and our comments are as follows:

I. Water Supply - Raw Water Withdrawal

As stated previously, City staff has been involved with Technical Advisory Group (TAG) since the beginning of the study. At the initial TAG meeting, City staff raised the issue that the study parameters and their associated concentration levels were not sufficient to draw any conclusions concerning possible deleterious effects to the surface drinking water supply. We would like to take this opportunity to officially voice our concern that adequate attention has not been paid to this issue. The lack of attention is evidenced by the omission of any substantive discussion of this issue in all of the draft and interim reports issued throughout the study prior to the issuance of the draft now under review.

GPA has, within the last month, commissioned a separate study of the possible effects of contaminates, particularly chloride and bromide, which may have a negative impact on the source water supply of the City's 58 MGD surface water treatment plant. The City

recognizes and appreciates the efforts of this study by GPA and it is with these efforts in mind that the remaining comments are offered.

- Section 5.4.2 of the draft specifies two alternatives under consideration for addressing any deleterious effects of the work proposed by GPA. It should be noted that both of these alternatives were nothing more than general points of discussion during a meeting with GPA's consultant representatives.

  The first alternative is the relocation of the raw water intake to a location with more favorable chloride concentration. Although, this may be a technically viable alternative, it will require the same level of study regarding site selection, raw water quality, additional infrastructure, etc., as would be required of any new raw water source. Also, the existing raw water intake is generally located within properties of the U.S. Fish and Wildlife Service. It is our understanding that permission for construction of an access road, pipelines and facility grounds within this area would not be easily obtained from the U.S. Fish and Wildlife Service. Therefore, any new facility and associated pipelines and access roads would be required to be routed around this area. Relative to this alternative, an estimated cost of $25 million to relocate the raw water station was part of the general discussion with GPA's consultants.

  The second alternative is the implementation of one alternative as provided in the Corps of Engineers feasibility study entitled "Lower Savannah River Basin Feasibility Report". This alternative consist of the modification to a cut opened by the Corps of Engineers for the purposes of enhanced river transportation during the early 1960's. Although, this alternative was desirable by U.S. Fish and Wildlife for the purposes of environmental restoration, it was not the selected alternative as provided in the final report due to the lack of sufficient flow benefits compared to the additional cost of the project. As the focus of the Lower Savannah River study did not include any work associated with specific constituents such as chloride and bromide, it is our opinion that a much more involved and specific study would need to be undertaken to determine the technical viability of this alternative.

  Based on the above discussion, it is our opinion that the alternatives as proposed by the GPA report have not had sufficient study or research to render them viable from either a technical or a cost perspective. Therefore, to consider the alternatives as proposed to be anything more than speculative at this time would be presumptuous.

- Section 5.4.2 correctly indicates that the City provided all available historical raw water data as requested by GPA's consultants. This data was obviously reviewed for correlations between historical river modifications and changes in raw water quality noted by water plant operations staff. The conclusions drawn and stated in this section of the draft are worded as follows:

"Other than the timing, there are no data to establish a cause and effect relationship between the previous deepening and the chloride increases. The City has measurements only at the intake and has no measurements either upstream or downstream. Thus, it is not possible to determine the source of the chlorides, whether chloride levels are chang7ng elsewhere in the river, the effect of further deepening on chloride levels, or what altery7atives may be available to deal with changes in chloride levels even if a cause and effect is determined. "

While the statements made are factual, the wording tends to imply several things to a reader of limited background.

Implication 1

This wording would lead one to believe that although the City has collected raw water data prior to and following other modifications to the harbor, no evidence exist that supports the claims by plant operations that subsequent increases in chlorides actually occurred and, therefore, the City has failed to prove that any substantial problem may exist.

The selection of the proper parameters associated with water quality sampling is extremely dependent on the specific goal to be achieved. Therefore, it is no surprise that a particular cause and effect cannot be found as the sampling, associated schedules, and locations were established for the purpose of routine monitoring of our raw water quality and not for the purposes of determining the effects of harbor modification. In addition, it should be stated without question that, as GPA is proposing the alterations to the river, it is their sole responsibility to prove the absence or degree of any negative impacts associated with their work and not the responsibility of the City to prove their existence.

Implication 2

The wording also needs to be modified to clarify that the inability to determine the source of the chlorides, their change elsewhere in the river, the effects of further deepening and possible alternatives is based only on existing data that was not collected for these purposes. 'The statement as written tends to imply that the technology to obtain the required data is not available.

- Section 5.4.2 of the draft includes the following statement:

"It is the opinion of the Savannah District, Office of Counsel, that the City does not have a compensable property interest under the Fifth Amendment in the chloride level of the water with the navigable channel "

It is not the intent of these comments to argue the legal merit of rights to the raw water quality. However, the following comments are offered in reference to this statement:

1. The industrial customers of the City of Savannah play an important role in the local economy, as does the Georgia Ports Authority. City discussions with these industries have indicated that the cost associated with modifications to their processes could range in the tens of millions of dollars if the chloride levels increase from the current approximate average of 12 ppm to as little as only 40 PPM.

2. The Georgia Environmental Protection Division has already issued an interim strategy associated with the use of ground water. This interim strategy calls for a I 0 million gallon per day reduction in ground water withdrawals within Chatham County by the year 2005. The only reasonable alternative water supply source is surface water influenced by the Savannah River. Therefore, the City's surface water treatment plant will continue to play an ever-increasing role in the growth and health of the southeast Georgia regional community. In fact, the City is well underway in implementing a long range water plan to implement this interim strategy. We are currently under contract to expand our surface water treatment plant at a cost of $18 million. We also expect within the next five years to implement an additional $14.5 million project to expand this plant. These substantial investments absolutely depend upon the quality of our source of water from Abercorn Creek.

3. The City has a vital interest in the quality of the water withdrawn from Abercorn Creek, as it is the life's blood of economic growth in the Southeast Georgia region. As a result of this interest, the City and its industrial customers have expended approximately $2 million over the past six years to improve and monitor the quality of the water supply from Abercorn Creek. The City of Savannah would be extremely concerned about any Federal or State activity that would initiate an action that may negate our efforts to improve water quality without a complete and thorough understanding of the consequences of the proposed activity.

4. A substantial portion of the above referenced expenditure -- approximately $500,000 -- has been expended by the City as the sponsor of the "Lower Savannah River Basin Feasibility Study" in conjunction with the Corps of Engineers. The results of this study have led to a project that has already received congressional approval, but to date has not been incorporated into the President's budget. Since the Corps of Engineers has also expended approximately $500,000 on this project, the City of Savannah would be extremely concerned about any Federal government endorsement or action on a federally cost shared project that might negate the improvements anticipated in the river basin feasibility study.

5. The U.S. Environmental Protection Agency has mandated, and the Georgia Environmental Protection Division is embarking on, an effort referred to as the Source Water Assessment and Protection Program. This regulation mandates that the source water watershed be delineated, an inventory of all potential sources of contaminants be developed, and an assessment of the susceptibility of the contaminants be determined. Compliance with this regulation will require a significant expenditure of resources in both manpower and funds. In light of this Federal requirement, the City of Savannah is extremely concerned about any activity
by State or Federal government that may negate these efforts to improve the source water assessment and protection without a thorough and complete understanding of the consequences of the proposed project.

6. Although current regulations set a Maximum Contaminant Level (MCL) of 250 ppm for chlorides, increased distribution system corrosion (thus increased lead and copper levels) as well as future regulations -- including current scheduling for phased regulations of Trihalomethanes and Disinfection By Products -- may also be effected without raw water chlorides actually exceeding the current MCL. The wording of this statement seems to imply that any amount of contamination below that which is established by law is acceptable. EPD defines maximum contaminant as *"the maximum permissible level of a contaminant in the water which is delivered to any user of a public water system. "* We believe that the intent of the MCL is to establish a maximum level which we are not to exceed. We do not believe that the intent is to establish a level to which we may increase contamination.

- In an effort to continue the progress associated with this project, GPA has made known to the City its intent to continue with the overall schedule of reports, reviews, approvals, etc. To prevent delays in the overall schedule, GPA has indicated a desire to include in its plan the study efforts associated with the City's concerns. While the Georgia Ports Authority has sought to work informally with the City, the Georgia Ports Authority has provided no specific commitment to take any action or to provide any funds necessary as a result of this project to ensure that the City continues to provide its customers with the same level of service and water quality that the City has provided for over 50 years.

- The draft report indicates that GPA is suggesting that their plan selection, environmental impacts, and project justification will not and should not be influenced by the efforts or results of the study concerning effects to the drinking water supply. Other than the single opinion of the Corps Office of Council regarding legal liability, we can find no basis for such a statement. In fact, due to:

  a) the lack of existing data to determine the impacts and their associated magnitude of the drinking water source (there is also no data to show that the chlorides or any other contaminant will not actually exceed mandated MCL's),

b) the order of magnitude of the cost associated with the only alternatives presented in the draft,

c) the order of magnitude of the cost to the local industries to modify their processes should chlorides increase even minimally, continuing to the point of selecting an alternative without these questions being answered could have a severe economic impact on Savannah's industrial customers.

- It also appears that GPA may be suggesting that if the post project effects to water quality cannot be readily projected, then it would be their desire to continue without a quantifiable understanding of the ramifications to the water supply quality and to determine and react to the effects after the project is complete. This approach could have catastrophic results for local industries, the magnitude of which will be proportionate to the actual changes in water quality. Changes to the water supply quality MUST be determined and required process modifications must be complete PRIOR to the commencement of any work associated with this project.

We are concerned that the tenor of the report implies a change in responsibility for the burden of proof concerning any deleterious water quality effects. Currently, as GPA is proposing to change the existing conditions, the burden of proof rests exclusively with GPA. However, the wording of the draft *("If an increase in chloride concentration is identified as having an adverse effect... ")* has the impact of shifting the burden of proof from GPA to the City to prove that the adverse effect exists and that the work by GPA was the cause. This is a completely unacceptable option.

II. Wastewater - Effluent Discharge

The section of the lower Savannah River between Houlihan Bridge on the west and Fields Cut on the east for many years has been classified as an industrial/navigation stream by the Environmental Protection Division (EPD) of Georgia. This classification was designated on the basis of a study by Georgia EPD that a dissolved oxygen (DO) level of 3.0 mg/L was not obtainable in this section of the river. This low DO level is a consequence of naturally occurring conditions rather than man-caused conditions. Nevertheless, the U.S. Environmental Protection Agency (EPA) has been pressuring EPD to reclassify this lower section of the river to a "fishing or above" classification.

If the "fishing or above" classification is assigned to the lower section of the river, it will impose a heavy cost burden on this community. Sewage treatment costs, both capital costs and operating costs, will increase substantially for both the City and the private industries. This in turn will make industrial growth and expansion more difficult.

This community was the first in the State to undertake a comprehensive pollution abatement program as required by the Clean Water Act. Not only did Savannah stop discharging untreated sewage into the river, Savannah also undertook the costly program of eliminating combined sewer lines that carried both stormwater and raw sewage.

The City's cost to date to comply with the mandates of the Federal Clean Water Act has been more than $50 million. The City has also expanded in 1995 the President Street Sewage Treatment Plant at a cost of $27 million. This expansion contained state-of-the-art technology that is designed to discharge a high quality effluent into the river. Unfortunately, this may not be enough to satisfy EPD and EPA if the "fishing or above" classification is assigned to the river. Now being proposed by EPD is that the "biological oxygen demand" (BOD) of the effluent discharge from sewage treatment facilities cannot be increased but may in fact have to be decreased. If mandated, the City cost for expanding the President Street Plant will increase by an estimated $15 million. Industries in Chatham County will be confronted with comparable cost increases for treatment facilities.

Savannah's primary concern is that the DO conditions declared a problem for fish life by EPA and EPD are not caused from BOD discharges from the City or the industries. In fact, analysis has determined that the City and industries account for only 15% of the total DO deficit and that the DO deficit is a result of non-point sources and flushing of organic material from the marshes and other wetlands. Studies also indicate that DO levels now in the river support diverse communities of aquatic life that are very similar to that found in natural estuaries. The study also found that the river was used by many species of fish and invertebrates.

Your office is aware that both EPA and EPD are not in agreement over the various factors affecting DO in the river. There is no doubt that some DO standards may be designated for the river. The standard may be the existing standard of 3.0 mg/L or a higher standard which will most certainly be an economic burden on the community.

A review of the Environmental Impact Statement indicated that a deepening to 50 feet would result in a 1.0 mg/L decrease in DO throughout the water column. As indicated, both EPD and EPA are considering raising the DO standard in the river. This possibility of a regulatory action to raise water quality standards and the projected DO decrease by 1.0 mg/L in the river due to the deepening project may place a severe economic burden on the cities and industries using the river for effluent discharges. Savannah does not want to pay a higher price to comply with a designated water quality standard due to a change in existing conditions in the river due to the deepening project. We are requesting that the following be addressed in terms of this DO decrease:

> Information on the DO model be shared with the industries and the City. Specific information as to calibration and the accuracy of the 1.0 mg/L decrease in DO should also be shared and evaluated by the industries and cities.
>
> Whatever mitigation that is recommended in the EIS to address the predicted decrease in DO is not acceptable. The regulatory agencies are going to require the permitted dischargers to upgrade their operations to meet any new water quality standard proposed for the Savannah River.
>
> The City will expect GPA to pay for any improvements required to meet any new water quality standard that may be designated for the river. This payment will

be based on the proportionate decrease in DO caused by the deepening project and the necessary plant upgrades to obtain this proportionate decrease in DO.

- In summary, the following points have been noted:

1.) The City has voiced our concerns regarding impacts to the drinking water source since the first TAG meeting without any substantial efforts by GPA to reach resolution.

2) The alternatives presented by GPA are based on very general points of discussion and the associated cost of the only technically feasible alternative is generally estimated at $25 million.

3) Several of the statements imply that the City has not proved that a problem exists and that the technology does not exist to quantify and predict the impacts.

4) Provision of the legal opinion, right or wrong, implies that past and current efforts and expenditures to improve and monitor the water quality supply by the City and its customers is without significant merit and that an increase in contamination of drinking water supplies to the maximum limit is unacceptable.

5) Financial impacts to the City's existing water customers could be tens of millions of dollars.

6) GPA requests that the selected alternative be decided without regard to results of any work current proposed on water supply quality.

7) A wait and see approach jeopardizes the ongoing operation of many of the City's existing customers and opens the door for a possible shift in the burden of proof regarding deleterious impacts.

8) The EIS has predicted a DO decrease of 1.0 mg/L in the river due to the deepening which may result in a significant economic impact to the City if the point source discharges are required by the regulatory agencies to improve operations to meet new water quality standards.

9) The model used by GPA to simulate DO in the river should be evaluated by the Harbor Committee members. History has documented that impacts have always been greater than models have predicted.

10) It has been determined that the DO problem in the river is due to the "man made hole" in the river. It is highly possible that any deepening of

the fuming basin will further deplete DO in the river. This should be considered in additional analyses.

Based on the concerns noted above and the fact that there is no clear commitment by GPA to provide mitigation or funding, should their proposed modifications cause deleterious effects to the standard of water quality the City has provided to its customers for over 50 years, it is necessary that the City oppose the selection of any alternative and request that the Corps of Engineers withhold all approvals of the project until such time as these concerns and issues can be addressed. It is also necessary that the City insist that NO actual modifications be made that even has the potential to cause direct or indirect changes in the water supply quality, until such time as those effects are fully understood and any required process modifications have been completed.

Again, we appreciate the opportunity to be involved with this project and to express our concern with the results and proposed plan to date. It is not the intention of the City of Savannah to delay the project nor cause any unnecessary expenditure of resources. It is unfortunate that, for whatever reason, there has been a failure to provide any substantive action throughout the study period regarding the concerns raised early by the City. However, the City of Savannah has an obligation to continue providing the standard of service and water quality as it has done for over 50 years to both its existing and future customers.

If we can be of any assistance in developing solutions with regard to these or other concerns, please contact us.

Sincerely,

Michael B. Brown
City Manager

Letter response

CITY OF SAVANNAH

Office of the City Manager
P.O. Box 1027
Savannah, Georgia 31402

June 12, 1999

I. Water Supply - Raw Water Withdrawal

1. COMMENT: We would like to take this opportunity to officially voice our concern that adequate attention has not been paid to possible deleterious effects to the surface drinking water supply this issue. The lack of attention is evidenced by the omission of any substantive discussion of this issue in all of the draft and interim reports issued throughout the study prior to the issuance of the draft now under review.

RESPONSE: The EIS will be revised to include further studies of the cause and effect relationship between salinity increases from the project and chloride levels at the City's water intake. The project will also include costs for the potential mitigation efforts resulting from an increase in chlorides. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

2. COMMENT: Section 5.4.2 of the draft specifies two alternatives under consideration for addressing any deleterious effects of the work proposed by GPA.

The first alternative is the relocation of the raw water intake to a location with more favorable chloride concentration. Although, this may be a technically viable alternative, it will require the same level of study regarding site selection, raw water quality, additional infrastructure, etc., as would be required of any new raw water source. Also, the existing raw water intake is generally located within properties of the U.S. Fish and Wildlife Service. It is our understanding that permission for construction of an access road, pipelines and facility grounds within this area would not be easily obtained from the U.S. Fish and Wildlife Service. Therefore, any new facility and associated pipelines and access roads would be required to be routed around this area.

The second alternative is the implementation of one alternative as provided in the Corps of Engineers feasibility study entitled "Lower Savannah River Basin Feasibility Report". This alternative consists of the modification to a cut on the Savannah River opened by the Corps of Engineers during the early 1960's. Although, this alternative was desirable by the USFWS for the purposes of environmental restoration, it was not the selected alternative as provided in the final report due to the lack of sufficient flow benefits compared to the additional cost

of the project. As the focus of the Lower Savannah River study did not include any work associated with specific constituents such as chloride and bromide, it is our opinion that a much more involved and specific study would need to be undertaken to determine the technical viability of this alternative.

Based on the above discussion, it is our opinion that the alternatives as proposed by the GPA report have not had sufficient study or research to render them viable from either a technical or a cost perspective. Therefore, to consider the alternatives as proposed to be anything more than speculative at this time would be presumptuous.

RESPONSE: See response to Comment #1 in the letter from the City of Savannah dated June 12, 1998.

3. COMMENT: Section 5.4.2 correctly indicates that the City provided all available historical raw water data as requested by GPA's consultants. This data was obviously reviewed for correlations between historical river modifications and changes in raw water quality noted by water plant operations staff. While the statements made in the DEIS are factual, the wording tends to imply several things to a reader of limited background.

Implication 1

This wording would lead one to believe that although the City has collected raw water data prior to and following other modifications to the harbor, no evidence exists that supports the claims by plant operations that subsequent increases in chlorides actually occurred and, therefore, the City has failed to prove that any substantial problem may exist.

The selection of the proper parameters associated with water quality sampling is extremely dependent on the specific goal to be achieved. Therefore, it is no surprise that a particular cause and effect cannot be found as the sampling, associated schedules, and locations were established for the purpose of routine monitoring of our raw water quality and not for the purposes of determining the effects of harbor modification.

Implication 2

The wording also needs to be modified to clarify that the inability to determine the source of the chlorides, their change elsewhere in the river, the effects of further deepening and possible alternatives is based only on existing data that was not collected for these purposes. 'The statement as written tends to imply that the technology to obtain the required data is not available.

RESPONSE: The intent of the wording in Section 5.4.2 is to identify that the analyses conducted were unable to develop a correlation between the last deepening and the measured chloride increases. The intent was not to state that no correlation exists. It is agreed that no new data was collected to help in developing this correlation and that the existing data set is insufficient for such a purpose. Presently a study plan which identifies a

data collection effort aimed at developing a data set sufficient for that purpose is under review by the City of Savannah. This study will be executed under the next phase upon acceptance by the City of Savannah on the methodology.

4. COMMENT: Section 5.4.2 of the draft includes the following statement: "*It is the opinion of the Savannah District, Office of Counsel, that the City does not have a compensable property interest under the Fifth Amendment in the chloride level of the water with the navigable channel.*" The following six comments are offered in reference to this statement:

1. The industrial customers of the City of Savannah have indicated that the cost associated with modifications to their processes could range in the tens of millions of dollars if the chloride levels increase from the current approximate average of 12 ppm to as little as only 40 ppm.

2. The use of surface water influenced by the Savannah River, such as that from Abercorn Creek, is likely to increase in the future.

3. The City has a vital interest in the quality of the water withdrawn from Abercorn Creek. The City of Savannah would be extremely concerned about any Federal or State activity that would initiate an action that may negate its efforts to improve water quality without a complete and thorough understanding of the consequences of the proposed activity.

4. Since the City of Savannah funded a portion of the Lower Savannah River Basin Feasibility Study, it would be extremely concerned about any Federal government endorsement or action on a federally cost shared project that might negate the improvements anticipated in the reports of that study.

5. GADNR-EPD is embarking on, an effort referred to as the Source Water Assessment and Protection Program. This regulation mandates that the source water watershed be delineated, an inventory of all potential sources of contaminants be developed, and an assessment of the susceptibility of the contaminants be determined. The City of Savannah is extremely concerned about any activity by State or Federal government that may negate these efforts to improve the source water assessment and protection without a thorough and complete understanding of the consequences of the proposed project.

6. Increased distribution system corrosion (thus increased lead and copper levels), as well as future regulations -- including current scheduling for phased regulations of Trihalomethanes and Disinfection By Products, may also be effected without raw water chlorides actually exceeding the current MCL. The wording of the DEIS seems to imply that any amount of contamination below that which is established by law is acceptable. GADNR-EPD defines maximum contaminant as *"the maximum permissible level of a contaminant in the water which is delivered to any user of a public water system. "* We believe that the intent of the

MCL is to establish a maximum level that we are not to exceed. We do not believe that the intent is to establish a level to which we may increase contamination.

RESPONSE: See response to Comment #1 in the letter from the City of Savannah dated June 12, 1998.

5. COMMENT: GPA has indicated a desire to include in its plan the study efforts to address the City's concerns in a more detailed manner. While GPA has sought to work informally with the City, GPA has provided no specific commitment to take any action or to provide any funds necessary as a result of this project to ensure that the City continues to provide its customers with the same level of service and water quality that the City has provided for over 50 years.

RESPONSE: See response to Comment #1 in the letter from the City of Savannah dated June 12, 1998.

6. COMMENT: The draft report indicates that GPA is suggesting that their plan selection, environmental impacts, and project justification will not and should not be influenced by the efforts or results of the study concerning effects to the drinking water supply. Other than the single opinion of the Corps Office of Council regarding legal liability, we can find no basis for such a statement. In fact, due to: (a) the lack of existing data to determine the impacts and their associated magnitude of the drinking water source; (b) the order of magnitude of the cost associated with the alternatives presented in the draft; and (c) the order of magnitude of the cost to the local industries to modify their processes should chlorides increase even minimally; continuing to the point of selecting an alternative without these questions being answered could have a severe economic impact on Savannah's industrial customers.

RESPONSE: See response to Comment #1 in the letter from the City of Savannah dated June 12, 1998.

7. COMMENT: It also appears that GPA may be suggesting that if the post project effects to water quality cannot be readily projected, then it would be their desire to continue without a quantifiable understanding of the ramifications to the water supply quality and to determine and react to the effects after the project is complete. This approach could have catastrophic results for local industries, the magnitude of which will be proportionate to the actual changes in water quality. Changes to the water supply quality must be determined and required process modifications must be complete prior to the commencement of any work associated with this project.

RESPONSE: See response to Comment #1 in the letter from the City of Savannah dated June 12, 1998.

8. COMMENT: We are concerned that the tenor of the report implies a change in responsibility for the burden of proof concerning any deleterious water quality effects. Currently, as GPA is proposing to change the existing conditions, the burden of proof

rests exclusively with GPA. However, the wording of the draft *("If an increase in chloride concentration is identified as having an adverse effect... ")* has the impact of shifting the burden of proof from GPA to the City to prove that the adverse effect exists and that the work by GPA was the cause. This is a completely unacceptable option.

RESPONSE: See response to Comment #1 in the letter from the City of Savannah dated June 12, 1998.

II. Wastewater - Effluent Discharge

9. COMMENT: The section of the lower Savannah River between Houlihan Bridge on the west and Fields Cut on the east for many years has been classified as an industrial/navigation stream by the GADNR-EPD. This classification was designated on the basis of a study by EPD that a dissolved oxygen (DO) level of 3.0 mg/L was not obtainable in this section of the river. This low DO level is a consequence of naturally occurring conditions rather than man-caused conditions. Nevertheless, EPA has been pressuring EPD to reclassify this lower section of the river to a "fishing or above" classification.

If the "fishing or above" classification is assigned to the lower section of the river, it will impose a heavy cost burden on this community. Sewage treatment costs, both capital costs and operating costs, will increase substantially for both the City and the private industries. This in turn will make industrial growth and expansion more difficult.

A review of the DEIS indicated that a deepening to 50 feet would result in a 1.0 mg/L decrease in DO throughout the water column. Both EPD and EPA are considering raising the DO standard in the river. This possibility of a regulatory action to raise water quality standards and the projected DO decrease by 1.0 mg/L in the river due to the deepening project may place a severe economic burden on the cities and industries using the river for effluent discharges. Savannah does not want to pay a higher price to comply with a designated water quality standard due to a change in existing conditions in the river due to the deepening project. We are requesting that the following be addressed in terms of this DO decrease:

a). Information on the DO model be shared with the industries and the City. Specific information as to calibration and the accuracy of the 1.0 mg/L decrease in DO should also be shared and evaluated by the industries and cities.

b). The mitigation is recommended in the EIS to address the predicted decrease in DO is not acceptable. The regulatory agencies are going to require the permitted dischargers to upgrade their operations to meet any new water quality standard proposed for the Savannah River.

c). The City will expect GPA to pay for any improvements required to meet any new water quality standard that may be designated for the river. This payment will be based on the proportionate decrease in DO caused by the deepening project and the necessary plant upgrades to obtain this proportionate decrease in DO.

RESPONSE: The EIS has been revised to provide for further studies of dissolved oxygen impacts and to include mitigation of project impacts on dissolved oxygen levels in the Savannah Harbor. The estimated costs of mitigation have been included in the project costs.

III. Summary:

10. COMMENT: The City has voiced our concerns regarding impacts to the drinking water source since the first TAG meeting without any substantial efforts by GPA to reach resolution.

RESPONSE: See response to Comment #1 in the letter from the City of Savannah dated June 12, 1998.

11. COMMENT: The alternatives presented by GPA are based on very general points of discussion and the associated cost of the only technically feasible alternative is generally estimated at $25 million.

RESPONSE: The estimated potential mitigation cost for relocating the City's water intake has been increased based on further information from the City.

12. COMMENT: Several of the statements imply that the City has not proved that a problem exists and that the technology does not exist to quantify and predict the impacts.

RESPONSE: It is not the intent of section 5.4.2 to state that the technology to project the potential impacts does not exist. Presently a study plan which identifies a data collection effort aimed at developing a data set sufficient for that purpose is under review by the City of Savannah. This study will be executed under the next phase upon acceptance by the City of Savannah on the methodology.

13. COMMENT: Provision of the legal opinion, right or wrong, implies that past and current efforts and expenditures to improve and monitor the water quality supply by the City and its customers is without significant merit and that an increase in contamination of drinking water supplies to the maximum limit is unacceptable.

RESPONSE: The DEIS does not render any judgement on the merits of the City's efforts to provide the highest quality of water. It does however address the drinking water standard for chlorides which is an important environmental issue related to the project. The EIS will be revised to include mitigation for impacts to the City's water supply.

14. COMMENT: Financial impacts to the City's existing water customers could be tens of millions of dollars.

RESPONSE: See response to Comment #1 in the letter from the City of Savannah dated June 12, 1998.

15. COMMENT: GPA requests that the selected alternative be decided without regard to results of any work current proposed on water supply quality.

RESPONSE: See response to Comment #1 in the letter from the City of Savannah dated June 12, 1998.

16. COMMENT: A wait and see approach jeopardizes the ongoing operation of many of the City's existing customers and opens the door for a possible shift in the burden of proof regarding deleterious impacts.

RESPONSE: See response to Comment #1 in the letter from the City of Savannah dated June 12, 1998.

17. COMMENT: The EIS has predicted a DO decrease of 1.0 mg/L in the river due to the deepening which may result in a significant economic impact to the City if the point source discharges are required by the regulatory agencies to improve operations to meet new water quality standards.

RESPONSE: The EIS has been revised to provide for further studies of dissolved oxygen impacts and to include mitigation of project impacts on dissolved oxygen levels in the Savannah Harbor. The estimated costs of mitigation have been included in the project costs.

18. COMMENT: The model used by GPA to simulate DO in the river should be evaluated by the Harbor Committee members. History has documented that impacts have always been greater than models have predicted.

RESPONSE: Stakeholders on the river will be invited to participate in the development of studies in the design phase of the project. This is for development of a final mitigation plan for the design phase.

19. COMMENT: It has been determined that the DO problem in the river is due to the "man made hole" in the river. It is highly possible that any deepening of the turning basin will further deplete DO in the river. This should be considered in additional analyses.

RESPONSE: The DO analysis in the DEIS strictly evaluates the impacts based upon the proposed design. The impacts projected in the model do consider the proposed deepening of the turning basin.

20. COMMENT: Based on the concerns noted above and the fact that there is no clear commitment by GPA to provide mitigation or funding, should their proposed modifications cause deleterious effects to the standard of water quality the City has provided to its customers for over 50 years, it is necessary that the City oppose the selection of any alternative and request that the Corps of Engineers withhold all approvals of the project until such time as these concerns and issues can be addressed. It is also necessary that the City insist that NO actual modifications be made that even has the potential to cause direct or indirect changes in the water supply quality, until such time as those effects are fully understood and any required process modifications have been completed.

RESPONSE: See response to Comment #1 in the letter from the City of Savannah dated June 12, 1998.

21. COMMENT: It is not the intention of the City of Savannah to delay the project nor cause any unnecessary expenditure of resources. It is unfortunate that, for whatever reason, there has not been any substantive action during the study regarding the concerns raised early by the City.

RESPONSE: See response to Comment #1 in the letter from the City of Savannah dated June 12, 1998.

City of Tybee Island (May 11)

Mayor Walter W. Parker

City Manager
Bill Farmer

CITY OF TYBEE ISLAND

City Council
Donald E. Anderson Jr.
Michael A. Hosti
Edward Merves
Anne P. Monaghan
Mallory Pearce
Jack Youmans

Assistant City Manager
Rowena B. Fripp

Clerk of Council
Jacquelyn R. Brown

City Attorney
Edward M. Hughes

May 11, 1998

William Bailey
Environmental Resources Branch
Army Corps of Engineers
P.O. Box 889
Savannah, Georgia 31402

Dear Mr. Bailey:

We are in receipt of several copies of the Draft Environmental Impact Statement (DEIS) for deepening the Savannah Harbor navigation channel, which was provided with a letter from M.J. Yuschishin indicating that any questions should be provided to you.

My major concern initially is whether or not some of the dredged ocean channel materials could be placed on Tybee Island. The issue is addressed in the DEIS, but due to the size of the document, I was unable to find upon a cursory review the needed supporting data. Could you kindly assist me in finding this information?

The 1993-1994 Channel Deepening Project reportedly deposited approximately 918,000 cubic yards of dredged material on Tybee Island. This material was judged suitable for beach material, but not as desirable as material from other borrow areas. Tybee Island was considered as an alternate dredged material disposal site, as opposed to beach nourishment as a primary purpose. The primary issue is if a similar handling of some ocean channel dredged material could result in having dredged material again be placed on Tybee Island.

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(912) 786-4573 - FAX (912) 786-5737

To facilitate a discourse on this, the following is provided:

1. Paragraph 7.1.3.2 states in part: "Based on data available geotechnical information, it appears that not all of the dredged material is suitable for beach placement. Therefore this disposal option was eliminated from further study during feasibility." If CED investigations indicate that sufficient suitable material is available, direct placement on Tybee will be reconsidered."

Tables 7-10 addresses the percentage of course sands versus the percentage of fines found in the locations of the channel from the mouth of Savannah River inland, but no similar table was found illustrating the "geotechnical information" for the ocean channel stations. Where is the data referenced in Paragraph 7.1.3.2?

2. Paragraph 7.1.3.1 states in part: "Based on the data used for the feasibility study, the percent fines was evaluated and determined to be unacceptable for placement in the nearshore zone. The evaluation is discussed in Reference 2.10. As a result, the material dredged from the entrance channel will be placed in the EPA offshore disposal site."

In addition to not finding this data, a question arises as to who should participate in making such a determination.

3. Paragraph 8.6 states in part: "Computations have been based on the assumption that all materials from Station 0+000 to -85+OOOB will be removed by hopper and clamshell dredges. All materials from Station 103+000 to 0+0000 will be removed by hydraulic pipeline dredges."

This assumption might preclude disposal on Tybee Island of some of the materials in the ocean channel from Station 0+000 to -85+OOOB. Should an analysis be made, rather than assumed?

4. Paragraph 7.1.4 states in part: "At this time, with the geotechnical information available, it does not appear the new work dredged material will be suitable for any of the alternate disposal sites. Additional sampling and testing will be conducted during the engineering and design phase, and if this data indicates the proposed dredged material is possibly suitable, these alternate disposal sites will be given further consideration. These additional borings will be done to support the dredging plans and specifications and are not being taken for evaluation of the alternate disposal sites."

This geotechnical information has not been found in the DEIS. Also, the last sentence appears that the possibility of placing material on Tybee Island is remote.

5. Paragraph 7.1.4.2 states in part: "Material percentages developed for the last deepening were used to determine the percentages of fine and coarse grained materials. Tables 23, 24, 25 and 26 contain a breakdown of the percentages of dredging volumes of fine and coarse-grained materials."

Tables 23-26 may have been re-identified as Tables 7-7 through 7-10, and this data excludes ocean channel information, depicting only the upriver locations. Similar Tables for the ocean Stations were not located.

In brief, the placement of some dredged materials on Tybee Island appears to be a deferred issue at best. My concern is that unless the DEIS is modified, that it will be difficult to have this option seriously considered. It appears that assumptions were made and/or decisions were made regarding disposal of dredged materials, which merit additional documentation and/or review and re-consideration.

The 1993-1994 Deepening Project placed materials on Tybee Island, and the supporting data pertaining to that action might be referenced to support a similar decision for the upcoming project. A reasonable assumption would be that such placement would be environmentally sound and cost-effective, and available data might support such a determination in the DEIS.

In addition to placing sand on the shoreline of Tybee Island, the City is also interested in having sand dunes develop for added storm protection. The DEIS does not appear to address this possible use of the dredged materials. If feasible, there could be positive economic benefits from placement of sands on Tybee Island, either on the shoreline or in the construction of sand dunes, rather than a neutral "disposal" offshore of all dredged materials.

It may be possible to partially coordinate an upcoming Tybee Beach Renourishment Project with the Savannah Harbor Navigation Project, providing some cost savings to both projects, as well as having other engineering benefits to both projects.

After you have had an opportunity to review this material, it would be appreciated if we could meet to discuss the issues.

Sincerely,

Bill Farmer

cc: Mayor and City Council
Doug J. Marchand
M..J. Yuschishin

Letter response

City of Tybee Island

P.0. Box 2749
403 Butler Avenue
Tybee Island, Georgia 31328-2749

DATE: May 11, 1998

1. COMMENT: Where is the geotechnical data referenced in Section 7.1.3.2 of the Feasibility Report?

RESPONSE: That information can be found in Section 3.6.4 of the EIS. Additional information can be found in a separate referenced document prepared by ATM for this project titled "Dredged Material Effects Evaluation".

2A. COMMENT: Where is the data and evaluation referenced in Section 7.1.3.1 of the Engineering Appendix?

RESPONSE: That reference is to the Alternative Ocean Dredged Material Placement Study dated December 1997 that was prepared by ATM. A copy is available to the public for review in the District office. A copy has also been provided to the City's coastal engineering consultant, Olsen Associates, Inc.

2B. COMMENT: Who should participate in determining the suitability of sediments for nearshore or direct beach placement?

RESPONSE: The determination of the suitability of sediments is both an engineering and environmental decision. Concerns related to the potential adverse effects of turbidity on aquatic life in the nearshore area make it prudent to limit the content of fine-grained materials in sediments to be deposited either in the nearshore area or directly on a beach. The 75 percent coarse-grained criteria for new work sediments stated in the DEIS was selected based on judgements of what would criteria would limit turbidity impacts on nearshore biota to acceptable levels. The public comment period on the DEIS allows everyone in the public an opportunity to comment on that criteria and participate in the decision of what criteria would be most appropriate. Project approvals received from natural resource agencies ultimately decide the conditions under which the project could be implemented.

3. COMMENT: An analysis should be made of the type of equipment to be used to excavate the sediments, rather than assuming certain equipment would be used.

RESPONSE: The statement in Section 8.6 of the Engineering Appendix will be revised to state that the computations were based on the use of equipment that would be most efficient in excavating, transporting and depositing the sediments within the guidelines established for constructing this project.

4. COMMENT: Where is the geotechnical information referenced in Section 7.1.4 of the Feasibility Report?

RESPONSE: That information is primarily contained in a separate referenced document prepared by ATM for this project titled "Dredged Material Effects Evaluation".

5. COMMENT: Unless the DEIS is modified, it will be difficult to have the placement of dredged sediments seriously considered after authorization. It appears that assumptions and/or decisions were made regarding placement of dredged sediments that merit additional documentation and/or review and reconsideration.

RESPONSE: The EIS will be revised to clarify that placement of dredged sediments in the nearshore and directly on Tybee Beach will be reconsidered. When additional geotechnical information becomes available during CED activities, a better characterization of the sediments to be excavated will be possible. If that information indicates that sufficient volumes of suitable sediments exist in a manner that would make their deposition in the nearshore or directly on the beach a cost-effective alternative to placement in the ODMDS, this project would implement such a placement plan.

6. COMMENT: The data supporting the 1993/1994 placement of dredged sediments on Tybee Island during that Deepening Project might be referenced to support a similar decision for this project.

RESPONSE: Information obtained during that project was used in the evaluation of direct beach placement during this proposed project.

7. COMMENT: The DEIS does not appear to address the City's desire to use sands to construct dunes along the shoreline. If feasible, this could have positive economic benefits.

RESPONSE: The DEIS does consider potential beneficial uses for dredged sediments. Sufficient volumes of suitable sandy sediments were not identified that could be excavated and transported to the beach in a cost-effective manner for potential use for dune construction. Should the investigations that will be performed prior to construction reveal that such beneficial uses could be accommodated in a cost-effective manner, the City will be contacted.

8. COMMENT: Coordination between the proposed project and the Tybee Beach Nourishment Project could provide cost savings and engineering benefits to both projects.

RESPONSE: All the economic benefits resulting from placing sediments from the navigation project directly on the beach are included in the economic analysis of such placement. If an engineeringly feasible, economically justified, and environmentally acceptable dredged material placement procedure can be developed for this project that would benefit the Tybee Beach Nourishment Project, it will be pursued. However, based on the preliminary construction schedule, placement of material on the beach should not be considered as a substitute for the proposed beach nourishment project.

9. COMMENT: A meeting was requested to discuss these issues.

RESPONSE: Representatives of the GPA met with Mr. Farmer and Mayor Parker on June 10 and discussed these issues.

CITY OF TYBEE ISLAND

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Mayor Walter W. Parker

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Assistant City Manager
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Clerk of Council
Jacquelyn R. Brown

City Attorney
Edward M. Hughes

May 22, 1998

Colonel Grant M. Smith
District Engineer
Savannah District
U.S. Army Corps of Engineers
Post Office Box 889
Savannah, Georgia 31402

RE: Savannah Harbor Expansion

Dear Colonel Smith:

1. In accordance with the Joint public Notice issued May 8, 1998 regarding the Savannah Harbor Expansion, a Public Hearing is requested in order to discuss plans for the Savannah Harbor Expansion Project, and to cause modifications to the Draft Feasibility Report and to the Draft Environmental Impact Statement, hereinafter referred to as the harbor Study Documents. The full particulars of the City's concerns will be established by City Council Resolution on May 28, 1998, and provided to you as a supplement to this communication.

2. The City of Tybee Island, situated immediately south of the planned Savannah Harbor Expansion Project, will be adversely impacted by the project without adequate mitigation, as currently described in the April Harbor Study Documents, due in part to the entrapment of additional quantities of sand in the channel due to its increased depth by the

project, and the resulting adverse economic and environmental impact to Tybee Island caused by a net increase in beach erosion.

3. Prior to the construction of the federal navigation project, Tybee island received sand which naturally passed along portions of the Savannah River ebb tidal shoals platform. The construction of the navigation channel essentially constructed a littoral trap which has deprived Tybee island of this sand source, thereby resulting in much of the historical and ongoing erosional trends experienced on Tybee island. Implementation of the Savannah Harbor Expansion Project will necessarily increase the capability of the channel to trap sand, additional sand entrapment in the channel will occur, and the increased littoral transport impacts will increase net erosion rates on Tybee Island. These effects will increase federal, state, and local governmental expenditures, decrease storm protection and recreational capabilities of the beaches of Tybee Island, increase channel maintenance costs, increase Tybee Island Beach Renourishment expenditures, and potentially result in increased property damage, loss of life, and decreases in the health, safety, and general welfare of Tybee island residents and visitors to the City, and otherwise cause adverse economic and environmental impacts to Tybee Island. Adequate mitigation of these effects is required and necessary, and the current Harbor Project Documents must be revised to reflect these facts.

4. The City of Tybee Island must receive all reasonably accessible beach compatible sand from all channel dredgings, to be placed on the northern half of Tybee Island, including both new work and future maintenance dredgings. Tybee Island must also receive all marginal sand from all new work and maintenance channel dredgings, which is reasonably accessible, by having such material placed within a feeder berm as close to the north and northeastern shores of Tybee Island as possible.

5. The City of Tybee Island must be represented on appropriate committees involved in the development and drafting of studies and plans associated with the Savannah Harbor Expansion Project, and must also be included in the official list of agencies for comment in the review process, as a result of the interrelationships which exist between the Savannah Harbor and Tybee Island.

6. Savannah Harbor Deepening Projects, Savannah Harbor Channel Maintenance Projects, and Tybee Island Beach Renourishment Projects are interrelated as a result of the close proximity of the Savannah Harbor and the City of Tybee Island, and the relationships of j3and movements in the area which impact such projects, or are impacted by such projects. As a result, the costs and benefits of all such projects must be fully evaluated on an area-wide basis, reflecting applicable interrelationships between the Savannah Harbor and Tybee Island.

7. Criteria and guidelines which govern the deposition of sediments on Tybee Island and/or in the nearshore areas to construct submerged berms, such as the 75% coarse grain guideline used by the Georgia Ports Authority, must be evaluated in light of current scientific data, and must be applied by affected shareholders with flexibility to reflect conflicting objectives and differing environments.

8 . Vibracore samples of sediments taken at six stations within the bar channel boundaries indicate that sediment in the vicinity of the bar channel is of beach quality and / or is highly suitable for nearshore placement along Tybee Island, with data indicating 63.5% to 93.7% sand, with fines percentages ranging from a low of 5.8% in the O&M segment of the channel near the maintained offshore limit, to a high of 35.1% fines in the new work material located within the first channel bend widener northeast of Tybee Island. Other data, including the 1993-1994 Channel Deepening Project experience whereby 918,000 cubic yards of dredged material was placed on Tybee Island, indicate that placement of dredged materials from the bar channel onto Tybee Island and the nearshore areas of Tybee Island is appropriate and cost effective; and is preferred to all other possible locations.

9. Placement of some dredged materials from the Savannah Harbor Expansion Project onto Tybee Island and the nearshore areas of Tybee Island would be at less cost than placement of these materials in the Ocean Disposal Site. The Harbor Project Documents need to be modified to reflect this fact. In addition, the benefits to society will be increased by placement of some dredged materials from the Harbor Expansion Project onto Tybee Island and the nearshore areas of Tybee Island, as compared to the benefits to society associated with disposal of these materials in the ocean disposal site. The Harbor Project Documents must be modified to reflect this fact.

10. Beach erosion has many causes, including tidal currents, wave effects, sea level fluctuation, storm action, and the net effects of the deposition of sand by littoral drift. Deepening the Savannah Harbor Channel will adversely affect the deposition of littoral drifted sand on Tybee Island, since the direction of net littoral drift along the shoreline is generally to the south, and a deeper channel will trap additional quantities of sand which would be drifting towards Tybee Island from the north, and from upstream in the Savannah River. conversely, a shallowing of the channel would decrease the amount of sand trapped in the harbor channel, and increase the littoral drift of sand to Tybee Island. In the extreme, removal of the ocean channel would restore natural littoral drift of sand which naturally bypassed along portions of the Savannah River ebb tidal shoals platform. Therefore, the proposed project would further incrementally change the present littoral drift system in the region, and adversely impact Tybee Island by capturing additional sand and decreasing the littoral drift of sand to Tybee Island. The composition of sand contained in the littoral drift contains both beach quality sand as well as other materials, all of which contribute to storm protection characteristics of the beach and nearshore areas of Tybee Island. Additional deprivation of littoral sand to Tybee Island is unnecessary, environmentally unsound, and economically unjustified.

Additional particulars and modifications to this document will be provided following the May 28th City Council meeting.

Sincerely,

Bill Farmer
City Manager

cc: Mayor & City Council
Mr. William G. Bailey, Environmental Resources Branch,
Planning Division, C.O.E.
M.J. Yuschishin, Chief, Planning Division, C.O.E.
Doug J. Marchand, GPA
Charles F. Griffen, GPA
Terry West GA DNR
Stuart Stevens, GA DNR
Erik Olsen, Olsen Associates

Letter response

City of Tybee Island

P.0. Box 2749
403 Butler Avenue
Tybee Island, Georgia 31328-2749

DATE: May 22, 1998

1. COMMENT: The City requests a Public Hearing to discuss the proposed project and cause modifications to the study reports.

RESPONSE: GPA has been meeting with individual groups and agencies during the Public Comment period, and plans to hold public information meetings and hearings during the CED phase as part of the preparation of the Tier II EIS.

2. COMMENT: The City of Tybee Island will be adversely impacted by the project due in part to the entrapment of additional quantities of sand in the channel due to its increased depth by the project, and the resulting adverse economic and environmental impact to Tybee Island caused by a net increase in beach erosion.

RESPONSE: An engineering analysis performed by Savannah District hydraulic engineers indicates that the proposed additional depth of the entrance channel will not increase the amount of material that accumulates in the existing channel. The study documents also reflect the impacts expected from removal of sediments from the oceanward extension of the entrance channel. The annual removal of that sediment from the channel at a distance of from 34,500 to 59,000 feet from the beach, and its subsequent relocation to the ODMDS located east of Tybee Island, is not expected to produce any discernable impact to Tybee Island. The engineering analyses do not indicate any increase in beach erosion would occur as a result of this proposed project.

3A. COMMENT: The construction of the navigation channel essentially constructed a littoral trap which has deprived Tybee island of this sand source, thereby resulting in much of the historical and ongoing erosional trends experienced on Tybee Island.

RESPONSE: When assessing the impact of the navigation channel on the littoral system, as it relates to the stability of the Tybee Island shoreline, the following facts must be considered:

(1) Most of the material removed from the entrance channel on an annual basis is not beach quality sand;

(2) No studies performed to date have conclusively demonstrated that either the existence or maintenance of the navigation channel has resulted in significant erosion of Tybee Island's beach; and

(3) Geologic data indicates that ocean shorelines are not stable, but have been moving for many years, sometimes over great distances.

Therefore, one cannot conclude that the navigation channel has caused much of the historical and ongoing erosional trends experienced on Tybee Island.

3B. COMMENT: Implementation of the Expansion Project will necessarily increase the capability of the channel to trap sand, additional sand entrapment in the channel will occur, and the increased littoral transport impacts will increase net erosion rates on Tybee Island.

RESPONSE: An engineering analysis performed by Savannah District hydraulic engineers indicates that the proposed additional depth of the entrance channel will not increase the amount of sand that accumulates in that existing channel. The study documents also reflect the impacts expected from removal of sediments from the oceanward extension of the entrance channel. The annual removal of that sediment from the channel at a distance of from 34,500 to 59,000 feet from the beach, and its subsequent relocation to the ODMDS located east of Tybee Island, is not expected to produce any discernable impact to Tybee Island. The engineering analyses do not indicate any increase in beach erosion would occur as a result of this proposed project.

4. COMMENT: The City of Tybee Island must receive all reasonably accessible beach compatible sand from all channel dredging, to be placed on the northern half of Tybee Island, including both new work and future maintenance dredging. Tybee Island must also receive all marginal sand from all new work and maintenance channel dredging, which is reasonably accessible, by having such material placed within a feeder berm as close to the north and northeastern shores of Tybee Island as possible.

RESPONSE: Federal policy requires that the project be constructed in the lowest cost manner that is environmentally acceptable. The study documents reflect that further investigations will be performed prior to construction to assess the quality of the sediments more completely. If those investigations indicate that sufficient volumes of suitable sediments exist in a manner that would make their deposition in the nearshore or directly on the beach a cost-effective alternative to placement in the ODMDS, this project would implement such a placement plan. If suitable sediments are found, but the cost of such placement would be higher than at the ODMDS, the Federal government could not participate in the additional costs which that such placement would produce. If another government entity paid the incremental costs of such placement, it could be implemented as part of this project. This same policy and procedure applies to the deposition of sediments during future channel maintenance operations.

5. COMMENT: The City of Tybee Island must be represented on appropriate committees involved in the development and drafting of studies and plans associated with the Expansion Project, and must also be included in the official list of agencies for comment in the review process, as a result of the interrelationships that exist between Savannah Harbor and Tybee Island.

RESPONSE: The City of Tybee Island is on the list of parties to review and comment on proposed actions that may affect Savannah Harbor. GPA and Savannah District will keep the City informed of the progress of the Expansion Project

6. COMMENT: The Expansion Project, channel maintenance projects, and Tybee Island Beach Renourishment Projects are interrelated as a result of the close proximity of the harbor and Tybee Island, and the relationships of sand movements in the area. As a result, the costs and benefits of all such projects must be fully evaluated on an area-wide basis, reflecting applicable interrelationships between the harbor and Tybee Island.

RESPONSE: Federal policy requires that all effects of a proposed project are to be evaluated and disclosed prior to the Federal decision-maker's decision whether to implement that project. The study reports acknowledge the complex interaction of sediments in the tidal delta. The hydraulic and coastal engineering studies performed in this study did not indicate that Tybee Island would experience any measurable impact from the proposed project. Potential landside economic benefits resulting from either nearshore or direct beach placement could have been included if sediment quality and engineering feasibility investigations had indicated that such placement should have been a feature of the proposed project.

7. COMMENT: The 75% coarse-grain criteria that governs the deposition of new work sediments on Tybee Island and/or in the nearshore areas must be evaluated in light of current scientific data, and must be applied by affected shareholders with flexibility to reflect conflicting objectives and differing environments.

RESPONSE: The criteria proposed in the study reports to judge the acceptability of sediments for nearshore or direct beach placement during the project's initial construction was selected based on the following factors: (1)scientific data on the effects of turbidity on biota in ocean waters, (2)observations made during the beach placement component of the previous harbor deepening project, (3)concerns expressed by environmental agencies for potential impacts to nearshore fisheries from excessive turbidity, (4)criteria commonly used for beach nourishment projects, (5)criteria used on a recently-approved nearshore placement project in Brunswick, and (6)coordination between Savannah District and GA DNR-CRD. The 45-day comment period on the draft study reports provides an opportunity for affected shareholders to express their views on this aspect of the project.

8. COMMENT: Placement of sediments dredged from the entrance channel onto Tybee Island and the nearshore areas of Tybee Island is appropriate and cost effective; and is preferred to all other possible locations.

RESPONSE: The sediment quality analysis performed on the entrance channel sediments for this study included all applicable borings for that reach. That analysis indicated that the sediments for the entire reach did not meet the environmental acceptability criteria established for this project. Further analyses will be performed prior to construction when additional information becomes available that will allow a better

characterization of the sediments that will be removed. If sufficient volumes of sediments are found that meet the suitability criteria, the costs will be recalculated to determine the best location (ODMDS, nearshore, or directly on the beach) to place those sediments. The project would then proceed to deposit the sediments in the lowest cost environmentally-acceptable manner and location.

9A. COMMENT: Placement of some sediments dredged from the Expansion Project onto Tybee Island and the nearshore areas of Tybee Island would be at less cost than placement of these materials in the ODMDS.

RESPONSE: The preliminary sediment quality evaluation indicated that the sediments in the entrance channel were unacceptable for placement in the nearshore or directly on the beach. Based on that determination, placement in the ODMDS would be less costly than placement in a CDF. A sediment evaluation will be performed again prior to construction when more detailed information becomes available on the sediments to be excavated during the initial construction. . If sufficient volumes of sediments are found that meet the suitability criteria, the costs will be recalculated to determine the best location (ODMDS, nearshore, or directly on the beach) to place those sediments. The project would then proceed to deposit the sediments in the lowest cost environmentally-acceptable manner and location.

9B. COMMENT: The benefits to society will be increased by placement of some sediments dredged from the Expansion Project onto Tybee Island and the nearshore areas of Tybee Island, as compared to disposal of these materials in the ODMDS.

RESPONSE: The preliminary sediment quality evaluation indicated that the sediments in the entrance channel were environmentally unacceptable for placement in the nearshore or directly on the beach. Therefore, estimation of societal benefits from such placement was not warranted. An evaluation of potential adverse impacts from placement in the ODMDS was included in the study reports.

10. COMMENT: The proposed project would further incrementally change the present littoral drift system in the region, and adversely impact Tybee Island by capturing additional sand and decreasing the littoral drift of sand to Tybee Island. The composition of sand contained in the littoral drift contains both beach quality sand as well as other materials, all of which contribute to storm protection characteristics of the beach and nearshore areas of Tybee Island. Additional deprivation of littoral sand to Tybee Island is unnecessary, environmentally unsound, and economically unjustified.

RESPONSE: An engineering analysis performed by Savannah District hydraulic engineers indicates that the proposed additional depth of the entrance channel will not increase the amount of material that accumulates in the existing channel. The study documents also reflect the impacts expected from removal of sediments from the oceanward extension of the entrance channel. The annual removal of that sediment from the channel at

a distance of from 34,500 to 59,000 feet from the beach, and its subsequent relocation to the ODMDS located east of Tybee Island, is not expected to produce any discernable impact to Tybee Island. The engineering analyses do not indicate any increase in beach erosion would occur as a result of this proposed project.

CITY OF TYBEE ISLAND

P.0. Box 2749 - 403 Butler Avenue,
Tybee Island, Georgia 31328-2749
(912) 786-4573 - FAX (912) 786-5737

June 12, 1998

Colonel Grant M. Smith
District Engineer
Savannah District
U.S. Army Corps of Engineers
Post Office Box 889
Savannah, Georgia 31402

RE: Savannah Harbor Expansion

Dear Colonel Smith:

By letter dated May 22, 1998 a public hearing was requested on the referenced project in accordance with the Joint Public Notice issued May 8, 1998. That communication indicated that the City Council would adopt a Resolution which would set forth the full particulars of the City's concerns, and that the Resolution would serve as a supplement to the May 22nd letter.

On June 11, 1998 the City Council of Tybee Island adopted the attached Resolution, which serves as a supplement to the May 22nd letter request for a public hearing to discuss plans for the Savannah Harbor Expansion Project, and to cause modifications to the Draft Feasibility Report and to the Draft Environmental Impact Statement regarding this project.

Sincerely,

Bill Farmer
City Manager

cc: Mayor & City Council
Mr. Bill Bailey, C.O.E.
M. J. Yuschishin, C.O.E.
Doug J. Marchand, GPA
Charles F. Griffen, GPA
Terry West, DNR
Stuart Stevens, GA DNR
Erik Olsen, Olsen Associates

RESOLUTION
SAVANNAH HARBOR EXPANSION PROJECT

CITY OF TYBEE ISLAND
June 11, 1998

WHEREAS, the City of Tybee Island has responsibilities for the care and maintenance of the beaches of Tybee Island, and the Georgia Ports Authority, in conjunction with the Savannah District U. S. Army Corps of Engineers, is planning a Savannah Harbor Expansion which will affect Tybee Island,

NOW, THEREFORE, the City Council of Tybee Island does hereby declare that:

1. In accordance with the Joint Public Notice issued May 8, 1998 regarding the Savannah Harbor Expansion, a Public Hearing is requested in order to discuss plans for the Savannah Harbor Expansion Project, and to cause modifications to the Draft Feasibility Report and to the Draft Environmental Impact Statement, hereinafter referred to as the "Harbor Study Documents".

2. The City of Tybee Island, situated immediately south of the planned Savannah Harbor Expansion Project, will be adversely impacted by the project without adequate mitigation, as currently described in the April Harbor Study Documents, due in part to the entrapment of additional quantities of sand in the channel due to its increased depth by the project, and the resulting adverse economic and environmental impact to Tybee Island caused by a net increase in beach erosion.

3. Prior to the construction of the federal navigation project, Tybee Island received sand which naturally passed along portions of the Savannah River ebb tidal shoals platform. The construction of the navigation channel essentially constructed a littoral trap which has deprived Tybee Island of this sand source, thereby resulting in much of the historical and ongoing erosional trends experienced on Tybee Island. Implementation of the Savannah Harbor Expansion Project will necessarily increase the capability of the channel to trap sand, additional sand entrapment in the channel will occur, and the increased littoral transport impacts will increase net erosion rates on Tybee Island. These effects will increase federal, state, and local governmental expenditures, decrease storm protection and recreational capabilities of the beaches of Tybee Island, increase channel maintenance costs, increase Tybee Island Beach Renourishment expenditures, and potentially result in increased property damage, loss of life, and decreases in the health, safety, and general welfare of Tybee Island residents and visitors to the City, and otherwise cause adverse economic and environmental impacts to Tybee Island.. Adequate mitigation of these effects is required and necessary, and the current Harbor Project Documents must be revised to reflect these facts.

4. The City of Tybee Island must receive all reasonably accessible beach compatible sand from all channel dredgings, to be placed on the northern half of Tybee Island, including both new work and future maintenance dredgings. Tybee Island must also receive all marginal sand from all new work and maintenance channel dredgings, which is reasonably accessible, by having such material placed within a feeder berm as close to the north and northeastern shores of Tybee Island as possible.

5. The City of Tybee Island must be represented on appropriate committees involved in the development and drafting of studies and plans associated with the Savannah Harbor Expansion Project, and must also be included in the official list of agencies for comment in the review process, as a result of the interrelationships which exist between the Savannah Harbor and Tybee Island.

6. Savannah Harbor Deepening Projects, Savannah Harbor Channel Maintenance Projects, and Tybee Island Beach Renourishment Projects are interrelated as a result of the close proximity of the Savannah Harbor and the City of Tybee Island, and the relationships of sand movements in the area which impact such projects, or are impacted by such projects. As a result, the costs and benefits of all such projects must be fully evaluated on an area-wide basis, reflecting applicable interrelationships between the Savannah Harbor and Tybee Island.

7. Criteria and guidelines which govern the deposition of sediments on Tybee Island and/or in the nearshore areas to construct submerged berms, such as the 75% coarse grain guideline used by the Georgia Ports Authority, must be evaluated in light of current scientific data, and must be applied by affected shareholders with flexibility to reflect conflicting objectives and differing environments.

8. Vibracore samples of sediments taken at six stations within the bar channel boundaries indicate that sediment in the vicinity of the bar channel is of beach quality and/or is highly suitable for nearshore placement along Tybee Island, with data indicating 63.5% to 93.7% sand, with fines percentages ranging from a low of 5.8% in the O&M segment of the channel near the maintained offshore limit, to a high of 35.1% fines in the new work material located within the first channel bend widener northeast of Tybee Island. Other data, including the 1993-1994 Channel Deepening Project experience whereby 918,000 cubic yards of dredged material was placed on Tybee Island, indicate that placement of dredged materials from the bar channel onto Tybee Island and the nearshore areas of Tybee Island is appropriate and cost effective; and is preferred to all other possible locations.

9. Placement of some dredged materials from the Savannah Harbor Expansion Project onto Tybee Island and the nearshore areas of Tybee Island would be at less cost than placement of these materials in the Ocean Disposal Site. The Harbor Project Documents need to be modified to reflect this fact. In addition, the benefits to society will be increased by placement of some dredged materials from the Harbor Expansion Project onto Tybee Island and the nearshore areas of Tybee Island, as compared to the benefits to society associated with disposal of these materials in the ocean disposal site. The Harbor Project Documents must be modified to reflect this fact.

10. Beach erosion has many causes, including tidal currents, wave effects, sea level fluctuation, storm action, and the net effects of the deposition of sand by littoral drift. Deepening the Savannah Harbor Channel will adversely affect the deposition of littoral drifted sand on Tybee Island, since the direction of net littoral drift along the shoreline is generally to the south, and a deeper channel will trap additional quantities of sand which would be drifting towards Tybee Island from the north, and from upstream in the Savannah River. Conversely, a shallowing of the channel would decrease the amount of sand trapped in the harbor channel, and increase the littoral drift of sand to Tybee Island. In the extreme, removal of the ocean channel would restore natural littoral drift of sand which naturally bypassed along portions of the Savannah River ebb tidal shoals platform. Therefore, the proposed project would further incrementally change the present littoral drift system in the region, and adversely impact Tybee Island by capturing additional sand and decreasing the littoral drift of sand to Tybee Island. The composition of sand contained in the littoral drift contains both beach quality sand as well as other materials, all of which contribute to storm protection characteristics of the beach and nearshore areas of Tybee Island. Additional deprivation of littoral sand to Tybee Island is unnecessary, environmentally unsound, and economically unjustified.

11. The Draft Environmental Impact Statement for the Harbor Deepening Project indicates, in Section 2.3, that "A central aim of the DEIS is full consideration of all expectant impacts and environmental issues of concern." However, the DEIS (Draft Environmental Impact Statement) and the Draft Feasibility Study documents do not include Tybee Island in the listing of "all expectant impacts and environmental issues of concern", despite abundant data and other documentation that Tybee Island is indeed adversely impacted by the presence of the harbor channel, and that an approximate twenty percent (20%) deepening of the harbor channel would be expected to further adversely impact Tybee Island.

For example, Section 1.4 of the Executive Summary in the Draft Feasibility Report states in part: "Preliminary data indicated six areas which might be affected by implementation of a harbor expansion project: ... " A review of the six areas listed illustrates that Tybee Island, located adjacent and south of the harbor expansion project, is not included in the list of even " ... areas which <u>might</u> be affected... " A review of both reports indicates that Tybee Island is not included in the final list of areas impacted by the Harbor Deepening Project.

<u>The City of Tybee Island asserts that the environmental impact of the Harbor Deepening Project on Tybee Island needs to be assessed by the Georgia Ports Authority and/or the Corps of Engineers in order to comply with established requirements</u>.

Further, Section 5.8.1 of the Draft Environmental Impact Statement does not adequately address the environmental assessment of the impact to Tybee Island, namely:

> "... A common belief is that the presence of a navigation channel intercepts this ('deposition of sand carried by littoral drift') transportation mechanism and retains this sand. In the Savannah region, the direction of net littoral drift along the shoreline is generally to the south. Historic data of dredge material

composition indicate the majority is not beach quality sand. Therefore, the proposed project is not expected to incrementally change the present littoral drift system in the region."

This section of the DEIS does not adequately address the environmental assessment of the impact to Tybee Island for the following reasons:

a. The sentence in the paragraph does not develop a logic set resulting in the stated conclusion.

b. The expression “common belief” in the first quoted sentence implies that the balance of the sentence is not supported by fact, when in reality the navigation channel does intercept sand which is drifting towards Tybee Island, with the second sentence affirming that the direction of sand drift from regions north of the channel is to the south, towards Tybee Island.

c. The third sentence references historic data of dredge material composition, which " ... indicate the majority is not beach quality sand." However, there is some beach quality sand in the littoral drifted sand, and the channel does intercept this sand. The environmental impact of this interception needs to be evaluated. Also, that sand which is not beach quality sand in the littoral drifted sand also contributes to the sand sharing system and benefits to Tybee Island, and even if in the majority, the deprivation of this non-beach quality sand has some environmental impact to Tybee Island. There may also be issues of "average composition" of dredged materials in different regions of the channel, at different times, versus current data or future expectations.

d. The stated conclusion reflected in the last sentence misses the point. The last sentence appears to conclude the analysis of impact to Tybee Island by concluding "Therefore, the proposed project is not expected to incrementally change the present littoral drift system in the region." This conclusion does not follow from the prior sentences, but more importantly, it refers to a possible littoral drift system change, or a sand transportation mechanism change, whereas the issue is whether or not there is an environmental impact to Tybee Island, and not whether or not a littoral drift system (or transportation mechanism) in the region is changed. Further, the "system" may or may not be impacted, but "sand flow" within the system will be impacted.

The DEIS and Draft Feasibility Report should be amended to address all environmental issues, as stated in Section 2.3 of the DEIS: "A central aim of the DEIS is full consideration of all expectant impacts and environmental issues of concern."

RESOLVED, by the City Council of Tybee Island, this 28th day of May, 1998.

Attest,
Jackie Brown, Clerk of Council

Walter W. Parker, Mayor
City of Tybee Island, Georgia

Letter response

CITY OF TYBEE ISLAND
P.0. Box 2749 - 403 Butler Avenue,
Tybee Island, Georgia 31328-2749

June 12, 1998

1. COMMENT: By letter dated May 22, 1998 a public hearing was requested on the referenced project in accordance with the Joint Public Notice issued May 8, 1998. That communication indicated that the City Council would adopt a Resolution which would set forth the full particulars of the City's concerns, and that the Resolution would serve as a supplement to the May 22nd letter.

On June 11, 1998 the City Council of Tybee Island adopted the attached Resolution, which serves as a supplement to the May 22nd letter request for a public hearing to discuss plans for the Savannah Harbor Expansion Project, and to cause modifications to the Draft Feasibility Report and to the Draft Environmental Impact Statement regarding this project.

RESPONSE: Noted.

City of Tybee Island – Olsen Associates (May 19)

May 19,1998

Mr. William Bailey, P.E.
Environmental Resource Branch
Savannah District, Corps of Engineers
P.O- Box 889
Savannah, GA 31402

Re: Savannah River Navigation Project Deepening

Dear Bill:

As the engineering representative of the City of Tybee Island, I am reviewing the DEIS for the deepening project. Accordingly, I would like to receive the following information:

- Dredging records for the project (i.e., date of volume) as far back as they go. Breakdown by inner project and bar cut would be useful.
- Dates and volumes of new construction i.e., project modifications) similarly broken down, if possible.

Thank you for your expedience in this matter.

Sincerely,

Erik J. Olsen, P.E.

EJO:lfm

cc: Bill Farmer, City Manager
City of Tybee Island

Olsen Associates, Inc.
4438 Herschel Street
Jacksonville, FL 32210
(904) 387-6114
(Fax) 384-7368

Letter response

City of Tybee Island

Olsen Associates, Inc.
4438 Herschel Street
Jacksonville, FL 32210

Date: May 19,1998

COMMENT: As the engineering representative of the City of Tybee Island, I would like to receive the following information:

- Dredging records for the project (i.e., date of volume) as far back as they go. Breakdown by inner project and bar cut would be useful.
- Dates and volumes of new construction i.e., project modifications) similarly broken down, if possible.

RESPONSE: This information was sent to Olsen Associates on June 2, 1998.

City of Tybee Island – Olsen Associates (May 20)

MEMORANDUM

TO: Myron Yuschishin, Chief of Planning
Savannah District C.O.E.

CC: Bill Farmer, City of Tybee Island

FROM:Erik J. Olsen, P.E.

DATE: May 20,1998

RE: Savannah Harbor Expansion - Request For Information

In my continuing review of the DEIS and supporting materials related to the above--referenced project for the City of Tybee Island, I have noted several certain sub-studies related to the project. Accordingly, I would greatly appreciate receiving copies of the following publications:

- Preliminary Coastal Erosion Study - Savannah Harbor Deepening (ATM, 1997)
- Hydrodynamic and Water Quality Monitoring of the Lower Savannah River Estuary, July - September, 1997 (ATM? - source not given)
- LTMS report (USACE, 1996).

Please note that although these studies are cited throughout the DEIS, they are not included in any list of references.

Thank you for your expeditious assistance in this manner.

Olsen Associates, Inc.
4438 Herschel Street
Jacksonville, FL 32210
(904) 387-6114
(Fax) 384-7368

Letter response

City of Tybee Island

Olsen Associates, Inc.
4438 Herschel Street
Jacksonville, FL 32210

Date: May 20,1998

1. COMMENT: As part of my review for the City of Tybee Island, I would greatly appreciate receiving copies of the following publications:

- Preliminary Coastal Erosion Study - Savannah Harbor Deepening (ATM, 1997)
- Hydrodynamic and Water Quality Monitoring of the Lower Savannah River Estuary, July - September, 1997 (ATM? - source not given)
- LTMS report (USACE, 1996).

RESPONSE: A copy of these reports was provided to Olsen Associates.

2. COMMENT: Please note that although these studies are cited throughout the DEIS, they are not included in any list of references.

RESPONSE: The EIS will be revised to list these references.

Organizations, Industries, and Corporations

Coastal Georgia Audubon Society

COASTAL GEORGIA AUDUBON SOCETY

Post Office Box 2l726
St. Simons Island, Georgia 31522

June 20, 1998

William Bailey
William Bailey
Planning Division
U.S. Army Corps of Engineers
P.0. Box 889
100 W. Oglethorpe Avenue Savannah, GA 31402

Dear Sir:

The Coastal Georgia Audubon Society opposes the proposal to deepen the lower 21.3 miles of the Savannah River to a depth of 44 to 50 feet. We consider the feasibility study to be totally inadequate. Insufficient consideration has been given to the effect of the deepening on the valuable Savannah Wildlife Refuge, and to the endangered wood storks which depend on the freshwater marsh for their food. Another endangered species, the shortnose sturgeon, would also be impacted. Other fishes and a very large number of bird species would also be jeopardized.

In addition to the wildlife impacts, the commercial fishery would be subject to further damage. Dredging would also endanger beachfront properties by increasing the rate of erosion of sand from the beaches, which would decrease nesting habitat for threatened loggerhead turtles. The biggest unknown is the effect of the dredging on water quality for municipal and industrial purposes. All of these issues are too important to be decided without further study.

It is difficult to say whether our main objection to this project is for its effect on the environment, or the effect on us as taxpayers. How long can we make decisions on costly harbor deepening projects strictly on a political basis? Must each harbor on the coast be deepened to allow a limited number of large ship to be accommodated? Budget restraints should require that a comprehensive study be made to decide which harbor or harbors can most economically be deepened. The cost of maintenance should also be factored in.

Our natural resources and our pocketbooks have been severely impacted by previous one-at-a time decisions on projects. It is time to consider the whole picture. What better time to start than now?

We appreciate this opportunity to comment on this proposal.

Very truly yours,

Lorraine Dusenbury, Secretary

Letter response

COASTAL GEORGIA AUDUBON SOCETY

Post Office Box 2l726
St. Simons Island, Georgia 31522

Date: June 20, 1998

1. COMMENT: The Coastal Georgia Audubon Society opposes the proposal to deepen the lower 21.3 miles of the Savannah River to a depth of 44 to 50 feet.

RESPONSE: No response necessary.

2. COMMENT: We consider the feasibility study to be totally inadequate. Insufficient consideration has been given to the effect of the deepening on the valuable Savannah Wildlife Refuge, and to the endangered wood storks which depend on the freshwater marsh for their food. Another endangered species, the shortnose sturgeon, would also be impacted. Other fishes and a very large number of bird species would also be jeopardized.

RESPONSE: The EIS recognizes the value of these resources in the Savannah River estuary. The project includes impact avoidance features and mitigation for those impacts that are unavoidable.

3. COMMENT: In addition to the wildlife impacts, the commercial fishery would be subject to further damage. Dredging would also endanger beachfront properties by increasing the rate of erosion of sand from the beaches, which would decrease nesting habitat for threatened loggerhead turtles. The biggest unknown is the effect of the dredging on water quality for municipal and industrial purposes. All of these issues are too important to be decided without further study.

RESPONSE: These issues have been adequately addressed in the EIS, which has either concluded there is no impact or has offered a mitigation plan for project impacts.

4. COMMENT: It is difficult to say whether our main objection to this project is for its effect on the environment, or the effect on us as taxpayers. How long can we make decisions on costly harbor deepening projects strictly on a political basis? Must each harbor on the coast be deepened to allow a limited number of large ship to be accommodated? Budget restraints should require that a comprehensive study be made to decide which harbor or harbors can most economically be deepened.

RESPONSE: NEPA requires that the project must be economically justified and environmentally acceptable.

5. COMMENT: The cost of maintenance should also be factored in.

RESPONSE: Potential increases in harbor maintenance costs were evaluated. The Feasibility Report does identify increases that are expected, and those costs are included in the economic analysis of the proposed project.

6. COMMENT: Our natural resources and our pocketbooks have been severely impacted by previous one-at-a time decisions on projects. It is time to consider the whole picture.

RESPONSE: NEPA requires that the project must be economically justified and environmentally acceptable.

Coastal Georgia Center for Sustainable Development

17 June 1998

William Bailey
Attn: SESASPO-E
US Army Corps of Engineers
PO Box 889
Savannah, GA 31402-0889

Dear Mr. Bailey:

I am writing to comment on the *Draft Environmental Impact Statement* for the Savannah harbor and channel deepening project. Along with many others with whom I have spoken, I am deeply troubled by the inadequate assessment of significant impacts on natural and economic resources in the area that are highly probable if the project is implemented.

The value of key resources and activities most likely to be affected by the project are so enormous that even marginal impacts of a few percent translate into major annual economic losses. According to more complete preliminary assessment of these factors than any provided to date, adverse economic consequences could easily outweigh the projected net benefits that have been estimated in the draft EIS. For your review, I have enclosed a rudimentary summary of the estimated dollar value of the primary types of adverse impacts that are of greatest concern.

What is perhaps most troubling about the current status of this project and the analysis that supports it is the overwhelming inference that the official record (the EIS) has been prepared as a *pro forma* exercise, bridging the gap between preconceived notions and foregone conclusions. Contrary to how the Georgia Ports Authority represents this project, it is highly questionable that the harbor deepening is in the "public interest." Instead of an objective assessment, the draft EIS is a masked accounting (and promotion) of GPA's far more limited self-interest. And when substantial risks and consequences to key components of the local economy are overlooked in evaluating the project's feasibility, GPA's self-interest can hardly be described as "enlightened."

David C. Kyler, Executive Director
103 Saint Catherine Street, Saint Simons Island, Georgia 31522
Voice: (912) 638-4434Fax: (912) 634-1273 E-Mail: dksusdev@gate.net

Clearly, this project has profound implications for both natural resources and a wide range of important economic activities dependent on these resources, including industry, tourism, and fisheries. To proceed with a project in the name of economic progress while thereby exposing numerous existing businesses to substantial unacknowledged costs is simply naive and short-sighted. As further evidence of this counterproductive reasoning, it is my understanding that adverse consequences that were evaluated in the last Savannah harbor deepening project some 6 - 8 years ago have since been demonstrated to have been underestimated by a factor of 7 or more. Moreover, compensation that was promised to those incurring such adverse consequences has still not been made, many years after they were initially encountered.

Under such circumstances, it is surely in the public's interest to proceed cautiously. If my initial assessment is as impartial as various professional colleagues believe it to be, far more detailed and comprehensive study must be completed before revenues are committed to initiating this project. I urge you to consider the compelling reasons why the proposed channel and harbor modifications must not be permitted without extensive, objective assessment of the long-term consequences for all members of the regional community, particularly those having economic interests in natural resources. To be reliable, equitable, and accountable, such evaluation must be considerably more thorough than the analysis presented in the draft EIS.

If you have questions or comments about my observations and opinions, please call.

Sincerely,

David C Kyler
Executive Director

cc. Senator Max Cleland
Senator Paul Coverdell
Congressman Jack Kingston
Governor Zell Miller
Chairman Ben Porter, Board of Natural Resources
Commissioner Lonice Barrett, Georgia Department of Natural Resources

Coastal Georgia Center for Sustainable Development

Preliminary Estimates of Costs Related to Selected Impacts of the Proposed Savannah Harbor and Channel Deepening

[Estimated for Increasing Navigable Depth from 38-Feet to 44-Feet)
Annual and Five-Year Cumulative Impacts
Source: Coastal Georgia Center for Sustainable Development June 1998)

Impact Type	Estimated Annual Value	Estimated Annual Impact	Estimated One – Time Cost	Estimat*ed* 5-year Impact
Commercial Fisheries (habitat disruption)	50 million	$3 million (6.0%)		$15 million
Recreational Fisheries (habitat disruption)	$40 million	$2 million (5.0 %)		$10 million
Wildlife (habitat disruption)	$50 million	$20 million		$10 million
Tourism (shore erosion, water recreation)	$800 million	$5 million (0.6%)		$25 million
City of Savannah (water treatment facility)			$25 million (minimum)	$25 million
Industrial Water Treatmen (additional equipment)			$10 million (minimum)	$25 million
Facility Protection & Repai (docks – shore erosion)			$2 million (minimum)	$2 million
Facility Protection & Repai (Ft. Jackson			$1 million	$1 million
Total Cost of Impact		**$12 million a year**	**$38 million (one-time)**	**$98 million (5-year)***

Estimated minimum average annual cost of impacts (First 5 years) = $19.6 million

Total net annual benefits (from *Draft* Environmental *Impact Statement*) at

44 feet	46 feet	48 feet	50 feet
$6.2 million	$11.6 million	$1 1.0 million	$9.5 million

Conclusion:

Minimum estimated adverse impacts exceed net benefits by an average factor of 2:1.

Letter response

Coastal Georgia Center for Sustainable Development

David C. Kyler, Executive Director

103 Saint Catherine Street
Saint Simons Island, Georgia 31522

Date: 17 June 1998

1. COMMENT: I am deeply troubled by the inadequate assessment of significant impacts on natural and economic resources in the area that are highly probable if the project is implemented.

RESPONSE: The EIS recognizes the value of these resources in the Savannah River estuary. The project includes impact avoidance features and mitigation for those impacts that are unavoidable.

2. COMMENT: The value of key resources and activities most likely to be affected by the project are so enormous that even marginal impacts of a few percent translate into major annual economic losses. According to more complete preliminary assessment of these factors than any provided to date, adverse economic consequences could easily outweigh the projected net benefits that have been estimated in the draft EIS.

RESPONSE: NEPA requires that the project must be economically justified and environmentally acceptable.

3. COMMENT: What is perhaps most troubling about the current status of this project and the analysis that supports it is the overwhelming inference that the official record (the EIS) has been prepared as a *pro forma* exercise, bridging the gap between preconceived notions and foregone conclusions. Contrary to how GPA represents this project, it is highly questionable that the harbor deepening is in the "public interest." Instead of an objective assessment, the draft EIS is a masked accounting (and promotion) of GPA's far more limited self-interest. And when substantial risks and consequences to key components of the local economy are overlooked in evaluating the project's feasibility, GPA's self-interest can hardly be described as "enlightened."

RESPONSE: NEPA requires that the project must be economically justified and environmentally acceptable.

4. COMMENT: Clearly, this project has profound implications for both natural resources and a wide range of important economic activities dependent on these resources, including industry, tourism, and fisheries. To proceed with a project in the name of

economic progress while thereby exposing numerous existing businesses to substantial unacknowledged costs is simply naive and short-sighted.

RESPONSE: NEPA requires that the project must be economically justified and environmentally acceptable.

5. COMMENT: As further evidence of this counterproductive reasoning, it is my understanding that adverse consequences that were evaluated in the last Savannah harbor deepening project some 6 - 8 years ago have since been demonstrated to have been underestimated by a factor of 7 or more. Moreover, compensation that was promised to those incurring such adverse consequences has still not been made, many years after they were initially encountered.

RESPONSE: No response necessary.

6. COMMENT: It is surely in the public's interest to proceed cautiously. Far more detailed and comprehensive study must be completed before revenues are committed to initiating this project. I urge you to consider the compelling reasons why the proposed channel and harbor modifications must not be permitted without extensive, objective assessment of the long-term consequences for all members of the regional community, particularly those having economic interests in natural resources. To be reliable, equitable, and accountable, such evaluation must be considerably more thorough than the analysis presented in the draft EIS.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

7. COMMENT: I have enclosed a rudimentary summary of the estimated dollar value of the primary types of adverse impacts that are of greatest concern.

RESPONSE: No response necessary.

Coastal Group Sierra Club
P.0. Box 8502
Savannah, GA 31412-85O2

June 18,1998

William Bailey
US Army Corp of Engineers
Savannah District
P.O. Box 889
Savannah, GA 31402-889

Dear Mr. Bailey:

The Coastal Group Sierra Club, in reviewing the Draft Environmental Impact Statement (DEIS) and talking with various entities, has grave concerns and reservations about the Georgia Parts Authority (GPA) proposed deepening of the Savannah Harbor. These concerns center around, but are not limited to, impacts to the Savannah National Wildlife Refuge (SNWR), the striped bass and endangered shortness sturgeon as well as, beach renourishment and the Floridian Aquifer.

The SNWR, established in 1927, provides refuge and breeding grounds for migratory birds and other wildlife on 26,500 acres of various uplands and wetlands. Of that 26,500 acres, at one time 6,000 acres were freshwater tidal marsh, a rapidly declining habitat Previous deepenings and implementation of the tide gate resulted in significant saltwater intrusion which has greatly reduced this type of habitat in the refuge. The DEIS states that the currently proposed deepening will impact roughly 60% of the remaining freshwater tidal marsh which represents roughly 5% of remaining habitat along the Atlantic Coast. Of even greater concern is that past deepenings have underestimated the damage to the refuge by a factor of at least 7 and that GPA has yet to fulfill **all** its mitigation promises for the previous deepening,

Previous harbor deepenings and the routine operation of the tide gate, which began in 1977, have decimated the striped bass population in the Savannah River. Previously, the Savannah River supported one of the most important populations of this popular recreational fishery. But after implementation of tide gate operations, the reproduction of striped bass in the Savannah River estuary dropped to almost nothing. After the cessation of tide gate operations and even with a supplemental stocking program, and with significant financial investment from state and federal funds, the striped bass population has not recovered. Increased salinity from the currently proposed harbor deepening will further reduce the chances of ever reestablishing this once thriving population of striped bass.

The endangered shortness sturgeon habitat will be further stressed by the proposed project Dissolved oxygen levels in the River, already frequently at marginal levels for supporting a healthy aquatic habitat, will become even more deleterious. The shortnose sturgeon has used the Kings Island Turning Basin as nursery and foraging habitat. Decreased dissolved oxygen levels could result in a total lose of habitat for this endangered species in this location.

Prior to deepening and dredging the harbor, Tybee Island received sand from the Savannah River and the natural current of sand which flows southward along the Atlantic Coast. Disruption of these natural processes of which the continued deepenings are a contributing factor has resulted in significant erosion of Tybee Island's beach. Sediment samples in the DEIS indicate some of the material is of beach quality and/or highly suitable for nearshore placement near Tybee Island. Consideration needs to be given to the placement of these sediments on Tybee Island beach for renourishment rather than at the Ocean Disposal Site which removes beneficiary sediments completely from the natural process. The DEIS is does not completely address this issue.

The DEIS dismisses questions regarding breaching the Floridian Aquifer but if the upper, unconfined aquifers above the Floridian aquifer are penetrated, an exchange of water of poorer quality with that of the Floridian aquifer might be possible. As this issue is of great importance to the economic growth and quality of life of the area, it is our opinion that further study is warranted for this Issue.

Other concerns that are not adequately addressed and require further study include the following:

- Decrease in water quality including an increase in chloride levels and a decrease in dissolved oxygen levels
- Prediction of siltation locations
- Determination of harbor wideners (impacting property owners)
- Ship simulation studies
- Long-term disposal needs
- Clear economic justification of project
- Inclusion of **all** direct costs such as mitigation, loss of recreational activities and costs to water users such as industry in economic projections

In light of the aforementioned concerns, Coastal Group Sierra Club finds the Savannah Harbor proposed deepening DEIS seriously deficient and submits that the project not proceed without further study and input. In that regard, our group requests at least a 30 day time extension and public hearings for further comment on the DEIS.

Sincerely,

Terri Leffek
Chairman, Coastal Group Sierra Club

CC: Governor Zell Miller
Representative Jack Kingston
Senator Max Clelland
Senator Paul Coverdell
Lonice Barrett, GA DNR
Harold Reheis, GA DNR, EPD

Letter response

Coastal Group Sierra Club

P.0. Box 8502
Savannah, GA 31412-8502

Date: June 18,1998

1. COMMENT: Previous deepenings and implementation of the Tidegate resulted in significant saltwater intrusion that has greatly reduced the freshwater tidal marsh habitat in the Refuge.

RESPONSE: The adverse impacts of previous harbor improvements were identified during the planning for those projects and mitigated during their construction.

2. COMMENT: The DEIS slates that the currently proposed deepening will impact roughly 60% of the remaining freshwater tidal marsh which represents roughly 5% of remaining freshwater tidal marsh habitat along the Atlantic Coast.

RESPONSE: The EIS recognizes the value of the freshwater tidal marsh in the Savannah River estuary. The project includes impact avoidance features and mitigation for those impacts that are unavoidable.

3. COMMENT: Past harbor deepenings underestimated the damage to the Refuge by a factor of at least seven.

RESPONSE: The perception that the projections for salinity made in the last deepening project were off by a factor of 7 were derived from an analysis conducted by representatives of the USF&W. The results of this analysis were presented in a letter from Sam Hamilton of the USF&W. Review of the analyses identified that the calculations erroneously evaluated the "net" effect of the last deepening. This error was identified and accepted by USF&W. The statement therefore is not valid.

4. COMMENT: GPA has yet to fulfill all its mitigation promises for the previous deepening project.

RESPONSE: Concur. A transfer of ownership of land at Jones Island from the GADOT to the SC DHEC-OCRM has not yet occurred. GPA has not secured all the signatures needed from officials within the state of Georgia to transfer ownership of that state property. Work is continuing on that process. In the interim, the property has

remained undeveloped and in an undisturbed condition, fulfilling the biological purposes for which the ownership transfer was intended.

5. COMMENT: Increased salinity from the currently proposed harbor deepening will further reduce the chances of ever reestablishing the once thriving population of striped bass.

RESPONSE: The project is committed to examining and implementing impact avoidance features, especially avoidance of salinity and DO impacts. This might include options such as the closure of Middle River (which would reduce salinity levels in the main historic spawning area of the Back River). These avoidance measures will aim at enhancing the quality of the historic striped bass spawning and nursery area, thereby increasing the probability of recovery of that population.

6. COMMENT: Decreased dissolved oxygen levels could result in a total loss of habitat for the endangered shortnose sturgeon at the Kings Island Turning Basin.

RESPONSE: The proposed project will take steps to avoid, through mitigation, DO decreases that would cause adverse impacts to the SNS. In addition the project will fund long-term studies to ascertain any potential adverse impacts to SNS and these studies will serve as early warning controls for avoiding or correcting any future impacts. Furthermore, the project proposes to undertake habitat improvement measures upon concurrence from the appropriate agencies.

7. COMMENT: Disruption of the natural nearshore processes, of which the continued harbor deepenings are a contributing factor, has resulted in significant erosion of Tybee Island's beach.

RESPONSE: When assessing the impact of the navigation channel on the littoral system, as it relates to the stability of the Tybee Island shoreline, the following facts must be considered:

(1) Most of the material removed from the entrance channel on an annual basis is not beach quality sand;

(2) No studies performed to date have conclusively demonstrated that either the existence or maintenance of the navigation channel has resulted in significant erosion of Tybee Island's beach; and

(3) Geologic data indicates that ocean shorelines are not stable, but have been moving for many years, sometimes over great distances.

Therefore, one cannot conclude that the navigation channel has resulted in significant erosion of Tybee Island's beach.

8. COMMENT: Consideration needs to be given to the placement of suitable sediments on Tybee Island beach for renourishment rather than at the Ocean Dredged Material

Disposal Site (ODMDS) which removes beneficiary sediments completely from the natural process. The DEIS is does not completely address this issue.

RESPONSE: The potential beneficial use of channel sediments was evaluated. Based on information available at this time, the sediments do not appear suitable for placement in either the nearshore or directly on the beach. When additional geotechnical information becomes available during the CED phase, this determination will be reevaluated. Should sufficient volumes of suitable sediments be found that could be feasibly excavated and used in one of those beneficial manners, it would be pursued if found to be economically warranted. Previous seabed drifter studies conducted by the Corps and GADNR found that sediments deposited at the ODMDS are not removed from the natural process, but remain within the littoral drift and sand sharing system.

9. COMMENT: The DEIS dismisses questions regarding breaching the Floridian Aquifer. As this issue is of great importance to the economic growth and quality of life of the area, it is our opinion that further study is warranted for this issue.

RESPONSE: An evaluation was performed of the potential for the proposed project to impact groundwater resources, including the Floridan aquifer. Those investigations found that the proposed dredging would not breach that aquifer. A discussion of that investigation is contained in Section 5.2 of the Engineering Appendix.

10. COMMENT: Other concerns that are not adequately addressed and require further study include the following:

A. Decrease in water quality including an increase in chloride levels and a decrease in dissolved oxygen levels
B. Prediction of siltation locations
C. Determination of harbor wideners (impacting property owners)
D. Ship simulation studies
E. Long-term disposal needs
F. Clear economic justification of project
G. Inclusion of all direct costs such as mitigation, loss of recreational activities and costs to water users such as industry in economic projections

RESPONSE: GPA believes these concerns are addressed to a sufficient level in the EIS to determine the environmental acceptability and economic viability of the proposed project. The study documents include an assessment of the project's impacts on the existing long-term disposal needs (Concern E) and the management plan developed in 1996 through the Long Term Management Strategy Study. The documents – particularly the Economic Appendix – evaluated the economic justification of the project (Concern F). That evaluation included all direct costs that are reasonably certain to occur (Concern G). The EIS states that additional work will be performed during CED in the following areas: (A)further evaluation of potential impacts to chloride levels upstream of the harbor (Concern A), (B)more detailed sedimentation modeling to identify any changes in shoaling patterns (Concern B), and

(C)ship simulation investigations will specify what bend wideners would be needed to safely navigate the larger ships through the harbor (Concerns C and D).

11. COMMENT: The Coastal Group Sierra Club requests public hearings for further comment on the DEIS.

RESPONSE: GPA has been meeting with individual groups and agencies during the Public Comment period, and plans to hold public information meetings and hearings during the CED phase as part of the preparation of the Tier II EIS.

Coastal Group Sierra Club
P.0. Box 8502
Savannah, GA 31412-8502

July 6,1998

William Bailey
US Army Corp of Engineers
Savannah District
P.O. Box 889
Savannah, GA 31402-889

Dear Mr. Bailey:

In light of the review period extension, the Coastal Group Sierra Club maintains that the Draft Environmental Impact Statement (DEIS) for the Georgia Ports Authority (GPA) proposed deepening of the Savannah Harbor is seriously deficient. Concerns that are not adequately addressed and require further study include but are not limited to the following:

- Inadequate economic analysis including but not limited to the omission of mitigation costs, loss of recreational activities, and definition of the state taxpayer cost burden for deepening past 47 feet.

- Progressive loss of habitat, especially that of freshwater tidal marsh, at the Savannah National Wildlife Refuge due to underestimation of the saltwater intrusion and previous mitigation promises yet unfulfilled.

- Significant decreases in dissolved oxygen for which the current proposed solution, diffuser aeration, by the Corp requires further study as to cost and feasibility.

- Significant increases of chloride, bromides and other metals in saltwater affecting the City of Savannah I&D plant.

- Lack of ship simulation studies for the proposed project.

- Lack of definition of the wideners required which will impact real estate.

- Lack of prediction of siltation locations.

- Lack of clear economic justification for a 50 foot depth.

- Conflicting information regarding the increase in siltation in the harbor. (Note: The DEIS maintains no increase in siltation will occur resulting in no increase in maintenance dredging costs. Yet the June 15, 1998 GA DOT letter to the Corp states under General Comment #21 that based on actual observations, the DOT anticipates relocation of additional shoals upstream thus increasing the dredging and disposal costs.)

- Unclear impacts on both the striped bass and shortnose sturgeon due to predicted salinity increases and dissolved oxygen decreases.

- Lack of consideration for the disruption of the natural sand sharing system by the deepening and for placement of Ocean Disposal Site sediments on the Tybee Island beach.

Lack of analyses for incremental deepening options which does not allow an informed alternative analysis to be conducted

In light of the aforementioned concerns, Coastal Group Sierra Club continues to find the Savannah Harbor proposed deepening DEIS seriously deficient and again submits that the project not proceed without further study and input.

Sincerely,

Teri Leffek
Chairman, Coastal Group Sierra Club

cc: Governor Zell Miller
Representative Jack Kingston
Senator Max Cleland
Senator Paul Coverdell
Lonice Barrett, GA DNR
Harold Reheis, GA DNR, EPD

Letter response

Coastal Group Sierra Club

P.0. Box 8502
Savannah, GA 31412-8502

Date: July 6,1998

1. COMMENT: The Coastal Group Sierra Club maintains that the DEIS for GPA's proposed deepening of the Savannah Harbor is seriously deficient. Concerns that are not adequately addressed and require further study include but are not limited to the following:

- A. Inadequate economic analysis including but not limited to the omission of mitigation costs, loss of recreational activities, and definition of the state taxpayer cost burden for deepening past 47 feet.
- B. Progressive loss of habitat, especially that of freshwater tidal marsh, at the SNWR due to underestimation of the saltwater intrusion and previous mitigation promises yet unfulfilled.
- C. Significant decreases in dissolved oxygen for which the current proposed solution, diffuser aeration, by the Corp requires further study as to cost and feasibility. Significant increases at chloride, bromides and other metals in saltwater affecting the City of Savannah I&D plant.
- D. Lack of ship simulation studies for the proposed project.
- E. Lack of definition of the wideners required which will impact real estate.
- F. Lack of prediction of siltation locations.
- G. Lack of clear economic justification for a 50-foot depth.
- H. Conflicting information regarding the increase in siltation in the harbor. (Note: The DEIS maintains no increase in siltation will occur resulting in no increase in maintenance dredging costs. Yet the June 15, 1998 GA DOT letter to the Corp states under General Comment #21 that based on actual observations, the DOT anticipates relocation of additional shoals upstream thus increasing the dredging and disposal costs.)
- I. Unclear impacts on both the striped bass and shortnose sturgeon due to predicted salinity increases and dissolved oxygen decreases.
- J. Lack of consideration for the disruption of the natural sand sharing system by the deepening and for placement of Ocean Disposal Site sediments on the Tybee Island beach.
- K. Lack of analyses for incremental deepening options which does not allow an informed alternative analysis to be conducted

RESPONSE: The EIS is based on a maximum impact analysis of the 50-foot alternative. Some of the studies identified are scheduled to be performed during PED; dissolved oxygen features (Item C), ship simulation (Item D), detailed sedimentation analysis (Item F), shortnose sturgeon (Item I), and evaluation of the environmental effects of incremental project depths (Item K). The economic analysis (Item A) does include the costs of

environmental mitigation (wetland acquisition) and impact avoidance features (closure of Middle River and construction of shortnose sturgeon habitat in the upper harbor). The distribution of costs (Item A) between Federal and non-Federal partners are described in the Feasibility Report. The EIS contains an assessment of the harbor's confirmed cumulative impacts on the estuary (Item B). The Engineering Appendix identifies where wideners are expected to be needed (Item E). The Economic Appendix describes how the benefits were calculated that indicated that a 50-foot channel improvement is economically justified (Item G). No increase in the volume of sediments is expected in the inner harbor (Item H). Some upstream shift is expected in the location of the shoaling and the costs for that shift are included in the economic analysis. ATM performed a Coastal Erosion Study that evaluated the expected impacts of the project on the beaches within 10 miles of the project (Item J)..

2. COMMENT: The Coastal Group Sierra Club again submits that the project not proceed without further study and input.

RESPONSE: Additional environmental and engineering studies would be conducted during PED.

Coastal Heritage Society

Dedicated to preserving the cultural and natural heritage of the coastal area and providing a sense of awareness and pride in this heritage through programs of active public involvement.

June 22, 1998

Mr. William Bailey
Environmental Resources Branch
U.S. Army Corps of Engineers
P.O. Box 889
Savannah, GA 31402-0889

Dear Mr. Bailey,

I am enclosing the position taken by the Coastal Heritage Society relating to the C.S.S. Georgia and Fort Jackson. We have asked our supporters to indicate their support through letters and comment cards also.

The Society would like to add that it is very appreciative of the proposed efforts relating to the C.S.S. Georgia and Fort Jackson. But, in the case of Fort Jackson, it does not feel adequate measures are proposed in the DEIS. The Society feels, as does the Department of Natural Resources, that complete protection of the historic fort is required by the potential effects of the project.

The Society also wishes to state that if studies or agreements to mitigate damage in the future are suggested as solutions to its concerns then these must be accompanied by escrowed funds dedicated to this purpose. Past experience has shown the Society that unfunded MOS and Programmatic Agreements are not adequate protection.

Should you have questions about this position, please call our office at 912/651-6833 or 651-6840 and we will be happy to clarify any point.

Sincerely,

Scott W. Smith

SWS/lhb
Enclosures
Directors Office
P.O. Box 1153
Savannah, Georgia 31402

Position of the Coastal Heritage Society relating to the Environmental Impact Statement (EIS) for the proposed deepening of the Savannah Ship Channel as it relates to Fort Jackson

The Coastal Heritage Society has observed that the mud bank protecting Fort Jackson's wooden foundations from exposure to rot and marine parasites has been significantly reduced from past harbor improvements, the amount of the original mud bank that protects the wooden foundations of the fort from eventual collapse is measured in inches at this time.

It is the position of the Coastal Heritage Society that future deepening projects must include adequate physical shoreline protection for Fort Jackson.

The current EIS proposes 90 feet of steel sheet pile at a cost of $548,000.

This leaves approximately 190 feet unprotected from potential damage.

The EIS does not address the effect on the almost 800 feet of flanking stone rip rap that has protected the fort from damage from the sides and rear. The EIS does not address the effect on the stone rip rap in front of the historic walls of the fort. The EIS does not address the changed hydraulics of the river caused by the deeper channel and changes in the tide gates. The EIS does not address the method of tie in to the historic structure for the incomplete sheet piling proposed.

The Coastal Heritage Society after consultations with an independent engineering firm finds the recommendations in the EIS to be incomplete and inadequate to protect the fort from the effects of the project. The Society cannot support this project without these concerns being addressed. More complete physical protection must be included to protect the historic structure and it protecting mudbanks and riprap.

Adopted by the Board of Trustees of the Coastal Heritage Society at its June 2, 1998

Fort Jackson is publicly owned property listed on the National Register of Historic places and is the oldest fortified structure standing in Georgia. It has been operated by the Coastal Heritage Society for 23 years. Its application to be designated a National Historic Landmark will be submitted this year. It is also a rare example of a second system U.S. fort. It is operated as a public resource and is used by over 60,000 people a year.

Position of the Coastal Heritage Society relating to the Environmental Impact Statement (EIS) for the proposed deepening of the Savannah Ship Channel as it relates to the C.S.S. Georgia

It is the position of the Coastal Heritage Society that the C.S.S. Georgia is one of the most important historic resources in Georgia. The Society also feels that the $13,419,000 of effort

proposed in the Environmental Impact Statement is a legitimate approach to the preservation of this resource.

The Coastal Heritage Society has advocated the preservation the C.S.S. Georgia since 1978. The Society at this time states that in its role as managers of the Savannah History Museum and Old Fort Jackson it will seek to cooperate with the C.S.S. Georgia- project to as great an extent as possible. The Society will also use its influence and effort to include the C. S. S. Georgia project as a part of the Battlefield Park development concept for both the conservation and curation phases of this project.

Adopted by the Board of Trustees of the Coastal Heritage Society at its June 2, 1998

The C. S. S. Georgia is a federally owned historic resource listed on the National Register of Historic Places. The vessel is perhaps one of the ten most significant historic ship wrecks in U. S. waters. Even though the vessel has received much damage in the past its remains will allow a greater understanding of Southern technology and Confederate Naval life. Displays of the vessels artifacts and major components will be available to over 100,000 visitors a year.

EMC Engineering Services

EMC Engineering Services
23 East Charlton Street (31401)
P.O. Box 8101
Savannah, Georgia 31412
Phone (912) 232-6533
Fax (912) 232-2920

June 22, 1998

Mr. Scott Smith
Coastal Heritage Society
Post Office Box 782
Savannah, GA 31402

RE: EFFECTS OF SAVANNAH HARBOR DEEPENING ON FT. JACKSON

Dear Mr. Smith,

At your request, we have completed a cursory review of the Impact Assessment and Preliminary Stabilization Plan presented by the Georgia Port Authority. We are in agreement as to the preferred method of stabilization being steel sheet piling as this is a durable product with proven record of success in areas where maximum protection is needed.

The Preliminary Stabilization Plan indicates the need for 90 l. ft of steel sheet pile wall downstream of the moat tunnel structure and 21 l. .ft upstream of the moat tunnel structure. Figure 62 of the Savannah Harbor, Georgia Expansion Feasibility Study proposes an additional 150 l. ft of steel sheet pile wall downstream and 60 l. ft upstream of the areas previously identified. We believe that the survey information provided is insufficient to determine the point where the Savannah Harbor Deepening will not effect the slope areas adjacent to Fort Jackson. In lieu of further investigation in this area we recommend the installation of the entire sheet wall to insure that all structures of the fort are protected.

If you have any further questions concerning this matter please feel free to call.

Sincerely,

Larry M. Stuber, P.E.

Letter response

Coastal Heritage Society

Directors Office
P.O. Box 1153
Savannah, Georgia 31402

June 22, 1998

1. COMMENT: I am enclosing the position taken by the Coastal Heritage Society relating to the C. S. S. Georgia and Fort Jackson. We have asked our supporters to indicate their support through letters and comment cards also.

The Society would like to add that it is very appreciative of the proposed efforts relating to the C.S.S. Georgia and Fort Jackson. But, in the case of Fort Jackson, it does not feel adequate measures are proposed in the DEIS. The Society feels, as does the Department of Natural Resources, that complete protection of the historic fort is required by the potential effects of the project.

The Society also wishes to state that if studies or agreements to mitigate damage in the future are suggested as solutions to its concerns then these must be accompanied by escrowed funds dedicated to this purpose. Past experience has shown the Society that unfunded MOS and Programmatic Agreements are not adequate protection.

Should you have questions about this position, please call our office at 912/651-6833 or 651-6840 and we will be happy to clarify any point.

Position of the Coastal Heritage Society relating to the Environmental Impact Statement (EIS) for the proposed deepening of the Savannah Ship Channel as it relates to Fort Jackson

The Coastal Heritage Society has observed that the mud bank protecting Fort Jackson's wooden foundations from exposure to rot and marine parasites has been significantly reduced from past harbor improvements, the amount of the original mud bank that protects the wooden foundations of the fort from eventual collapse is measured in inches at this time.

It is the position of the Coastal Heritage Society that future deepening projects must include adequate physical shoreline protection for Fort Jackson.

The current EIS proposes 90 feet of steel sheet pile at a cost of $548,000.

This leaves approximately 190 feet unprotected from potential damage.

The EIS does not address the effect on the almost 800 feet of flanking stone rip rap that has protected the fort from damage from the sides and rear. The EIS does not address the effect on the stone rip rap in front of the historic walls of the fort. The EIS does not address the changed hydraulics of the river caused by the deeper channel and changes in the tide gates. The EIS does not address the method of tie in to the historic structure for the incomplete sheet piling proposed.

The Coastal Heritage Society after consultations with an independent engineering firm finds the recommendations in the EIS to be incomplete and inadequate to protect the fort from the effects of the project. The Society cannot support this project without these concerns being addressed. More complete physical protection must be included to protect the historic structure and it protecting mudbanks and riprap.

Position of the Coastal Heritage Society relating to the Environmental Impact Statement (EIS) for the proposed deepening of the Savannah Ship Channel as it relates to the C.S.S. Georgia

It is the position of the Coastal Heritage Society that the C.S.S. Georgia is one of the most important historic resources in Georgia. The Society also feels that the $13,419,000 of effort proposed in the Environmental Impact Statement is a legitimate approach to the preservation of this resource.

The Coastal Heritage Society has advocated the preservation the C.S.S. Georgia since 1978. The Society at this time states that in its role as managers of the Savannah History Museum and Old Fort Jackson it will seek to cooperate with the C.S.S. Georgia- project to as great an extent as possible. The Society will also use its influence and effort to include the C. S. S. Georgia project as a part of the Battlefield Park development concept for both the conservation and curation phases of this project.

RESPONSE: The proposed project was revised in the final study documents to include sheet pile protection of the entire length of the fort structure along the river shoreline.

Letter response

EMC Engineering Services

June 22, 1998

COMMENT: At your request, we have completed a cursory review of the Impact Assessment and Preliminary Stabilization Plan presented by the Georgia Port Authority. We are in agreement as to the preferred method of stabilization being steel sheet piling as this is a durable product with proven record of success in areas where maximum protection is needed.

The Preliminary Stabilization Plan indicates the need for 90 l. ft of steel sheet pile wall downstream of the moat tunnel structure and 21 l. .ft upstream of the moat tunnel structure. Figure 62 of the Savannah Harbor, Georgia Expansion Feasibility Study proposes an additional 150 l. ft of steel sheet pile wall downstream and 60 l. ft upstream of the areas previously identified. We believe that the survey information provided is insufficient to determine the point where the Savannah Harbor Deepening will not effect the slope areas adjacent to Fort Jackson. In lieu of further investigation in this area we recommend the installation of the entire sheet wall to insure that all structures of the fort are protected.

RESPONSE: The proposed project was revised in the final study documents to include sheet pile protection of the entire length of the fort structure along the river shoreline.

Coastal Heritage Society trustee (W.Donald Cogdell)

Copy of a handwritten letter

W. DONALD COGDELL
2 Rivers Edge Drive
SAVANNAH, GEORGIA 31406

July 5, 1998

Col. Grant M. Smith
District Engineer
Corps of Engineers
Savannah District
P.O. Box 889
Savannah, Ga. 131402

Dear Col. Smith;

As a member and trustee of the Coastal Heritage Society I would like to make the following comments concerning the deepening of Savannah Harbor.

As for the C.S.S. Georgia it has been ravaged by time and tide. It is regrettable that more cannot be done to preserve this valuable ship. However, I don't think that this is possible at this time. Therefore, I believe that the present proposal is the best that can be done at this time. Partial preservation is better than none.

The effects of the deepening on Fort Jackson is an entirely different matter. Past deepenings have taught us what this can do to the Fort. I do believe that further deepening would gravely endanger the Fort unless further steps are taken to protect it. Therefore, I do urge that we do whatever is necessary to protect Fort Jackson. We cannot afford to further damage or lose Fort Jackson as a result of the deepening. It can be protected and I urge that this be done.

Sincerely,

W.D. Cogdell

Cy. Mr. Marc E. Edwards
Mr. Robert D. Bush

Letter response

W. DONALD COGDELL
2 Rivers Edge Drive
SAVANNAH, GEORGIA 31406

Date: July 5, 1998

1. COMMENT: The C.S.S. Georgia has been ravaged by time and tide. It is regrettable that more cannot be done to preserve this valuable ship. However, I don't think that this is possible at this time. Therefore, I believe that the present proposal is the best that can be done at this time. Partial preservation is better than none.

RESPONSE: GPA appreciates the support for the actions included in the project pertaining to the C.S.S. Georgia.

2. COMMENT: Past deepenings have taught us what this can do to Fort Jackson. I believe that further deepening would gravely endanger the Fort unless further steps are taken to protect it. Therefore, I do urge that we do whatever is necessary to protect Fort Jackson. We cannot afford to further damage or lose Fort Jackson as a result of the deepening. It can be protected and I urge that this be done.

RESPONSE: The proposed project was revised in the final study documents to include sheet pile protection of the entire length of the fort structure along the river shoreline.

Coastal Heritage Society trustee (Hal V. Mangin)

June l5, 1998

Col. Grant M. Smith, District Engineer,
U.S. Army Corps of Engineers,
Savannah District
P.O. Box 889
Savannah, Ga. 31402

Dear Sir:

The Environmental Impact Statement for the proposed deepening of the Savannah Ship Channel includes C.S.S Georgia, and Fort Jackson.

The Coastal Heritage Society, whose broad mission is "to preserve the cultural and natural heritage of the coastal area…" applaudes the action proposed for the removal and preservation of artifacts from C. S. S Georgia. However, the Society, after consultations with an independent engineering firm, finds the recommendations in the EIS for Fort Jackson to be incomplete and inadequate, to protect the fort from the effects of the deepening. The Society cannot support this project unless these concerns are addressed.

Sincerely,

Hal V. Mangin, Trustee
Coastal Heritage Society

Letter response
Hal V. Mangin, Trustee
Coastal Heritage Society

June l5, 1998

1. COMMENT: The Coastal Heritage Society, whose broad mission is "to preserve the cultural and natural heritage of the coastal area applaudes the action proposed for the removal and preservation of artifacts from C.S.S Georgia.

RESPONSE: No response necessary.

2. COMMENT: The Society, after consultations with an independent engineering firm, finds the recommendations in the EIS for Fort Jackson to be incomplete and inadequate, to protect the fort from the effects of the deepening. The Society cannot support this project unless these concerns are addressed.

RESPONSE: The proposed project was revised in the final study documents to include sheet pile protection of the entire length of the fort structure along the river shoreline.

Mr. William Baily
Environmental Resources Branch
U.S. Army Corps of Engineers
P.O. Box 889
Savannah, GA 31402-0889

I support the Position of the Coastal Heritage Society relating to the C.S.S. Georgia and Fort Jackson as outlined below. This position is in response to proposals in the Environmental Impact Statement (EIS) that has been prepared as part of a new harbor deepening project.

C.S.S. GEORGIA: It is the position of the Coastal Heritage Society that the C.S.S. Georgia is one of the most important historic resources in Georgia. The Society also feels that the $13,419,000 of effort proposed in the EIS is a legitimate approach to the preservation of this resource. I support this portion of the project as written.

FORT JACKSON: It is the position of the Coastal Heritage Society that the proposed sheet pile protection in the EIS does not adequately safeguard the fort. Additional physical protection from effects of this project must be included in the plan and further studies completed. These should include protection for the complete river frontage of the historic structure and study as to the effects on the stone flanking protection structures. I oppose this portion of the project as written.

Name

Address

City, State Zip code

Signature

Coastal Heritage Society trustee (Murray K. Barnard)

BARNARD & KING

ARCHITECTS

MURRAY K. BARNARD, A.I.A CAMPBELL A. KING, III, A.I. TELEPHONE
204 EAST 39th STREET, SAVANNAH, GEORGIA 31401 (912)336-9804

July 3, 1998

Col. Grant M. Smith, District Engineer
U.S. Army Corps of Engineers
Savannah District
P.O. Box 889
Savannah, Georgia 31402

RE: PROPOSED SAVANNAH HARBOR DEEPENING

Dear Col. Smith:

As an interested citizen, who happens to also serve as a member of the Board of Trustees of the Coastal Heritage Society, I am concerned about the proposal for deepening the Savannah River Harbor and the effects this will have on the adjacent environment as well as such historical treasurers as the CSS Georgia wreckage and Fort Jackson.

I have been involved with the Coastal Heritage Society, which operates and cares for Fort Jackson, for over 20 years. In this time I have seen first hand the damage done to the foundations and shore line of the property adjacent to the fort caused by previous projects such as the Back River Project and the last deepening project. While public hearings were held, our concerns were ignored and the environmental impact studies were skewed as to minimize the detrimental effects on these historic properties.

Unless measures are taken to ensure that further damage to the Fort, its adjacent property, and the CSS Georgia wreckage is built into the planning and design of this project and adequate funds arc appropriated to accomplish this protection, we will be in grave danger of loosing these valuable resources. I am prepared to do everything in my power to see that this doesn't happen.

I therefore appeal to you to exercise the authority vested in you to ensure the protection and well being of these treasures.

Sincerely,

Murray K. Barnard, A.I.A.

cc: Coastal Heritage Society

Letter response

BARNARD & KING ARCHITECTS
204 EAST 39th STREET
SAVANNAH, GEORGIA 31401

Date: July 3, 1998

1. COMMENT: As an interested citizen, who happens to also serve as a member of the Board of Trustees of the Coastal Heritage Society, I am concerned about the proposal for deepening the Savannah River Harbor and the effects this will have on the adjacent environment as well as such historical treasurers as the CSS Georgia wreckage and Fort Jackson.

RESPONSE: The proposed project was revised in the final study documents to include sheet pile protection of the entire length of the fort structure along the river shoreline. When combined with the measures included for the CSS Georgia, GPA believes the proposed project fully addresses these two significant cultural and historic resources.

2. COMMENT: I have seen first hand the damage done to the foundations and shoreline of the property adjacent to the Fort caused by previous projects such as the Back River Project and the last deepening project. While public hearings were held, our concerns were ignored and the environmental impact studies were skewed as to minimize the detrimental effects on these historic properties.

RESPONSE: No response necessary.

3. COMMENT: Unless measures are taken to ensure that further damage to the Fort, its adjacent property, and the CSS Georgia wreckage is built into the planning and design of this project and adequate funds arc appropriated to accomplish this protection, we will be in grave danger of loosing these valuable resources. I am prepared to do everything in my power to see that this doesn't happen.

RESPONSE: The proposed project was revised in the final study documents to include sheet pile protection of the entire length of the fort structure along the river shoreline. When combined with the measures included for the CSS Georgia, GPA believes the proposed project fully addresses these two significant cultural and historic resources.

4. COMMENT: I therefore appeal to you to exercise the authority vested in you to ensure the protection and well being of these treasures.

RESPONSE: The proposed project was revised in the final study documents to include sheet pile protection of the entire length of the fort structure along the river shoreline. When combined with the measures included for the CSS Georgia, GPA believes the proposed project fully addresses these two significant cultural and historic resources.

Coastal Heritage Society supporters

CARDS STATING AN INDIVIDUAL'S SUPPORT OF THE POSITION OF THE COASTAL HERITAGE SOCIETY

1. COMMENT: C.S.S. GEORGIA: The C.S.S. Georgia is one of the most important historic resources in Georgia. The $13,419,000 of effort proposed in the DEIS is a legitimate approach to the preservation of this resource. I support this portion of the project.

RESPONSE: The project recognizes the cultural and historic value of the C.S.S. Georgia. The plan proposed to address the project's impacts on this resource would result in invaluable historic information on this resource and its place in history.

2. COMMENT: FORT JACKSON: The proposed sheet pile protection in the EIS does not adequately safeguard the fort. Additional physical protection from effects of this project must be included in the plan and further studies completed. These should include protection for the complete river frontage of the historic structure and study as to the effects on the stone flanking protection structures. I oppose this portion of the project as written.

RESPONSE: The proposed project was revised in the final study documents to include sheet pile protection of the entire length of the fort structure along the river shoreline.

(See list of individuals who sent in a card supporting position of the Coastal Heritage Society at end of comments)

INDIVIDUALS WHO SUPPORT OF THE POSITION OF THE COASTAL HERITAGE SOCIETY

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	Sam	Downing	15345 Mason Ferry Road	Citronelle	AL	36522	10-Jun
Ms.	Karen	Markham	P.O. Box 2666	Daphne	AL	36526	9-Jun
Ms.	Kitty	Lowe	1880 Harford Hwy C12	Dothan	AL	36301	8-Jul
Mr.	James R.	Spradlin	220 Stonegate Dr.	Dothan	AL	36305	8-Jul
Mr.	James Edwin	Pentecost	1410 Reid Circle	Gadsden	AL	35903	10-Jun
Mrs.	James Edwin	Pentecost	1410 Reid Circle	Gadsden	AL	35903	10-Jun
Mr.	Frank	Fitch	7071 S. Street Highway 95	Gordon	AL	36343	10-Jun
Mr.	Morgan	Cross	1804 Main St.	Greensboro	AL	36744	18-Jun
Mr.	David	McCormick	833 Main St. W.	Hartselle	AL	35640	30-Jun
Ms.	Jeannine	McCormick	833 Main St. W.	Hartselle	AL	35640	30-Jun
	Arlie	Cecil	317 Walker Lane	Hazel Green	AL	35750	8-Jul
Ms.	Tracie	Cecil	317 Walker Lane	Hazel Green	AL	35750	8-Jul
Mrs.	Mickey	Eads	349 Village at Moody	Leeds	AL	35094	18-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	William R.	Eads	349 Village at Moody	Leeds	AL	35094	18-Jun
Mrs.	Jo Ann	Martin	3070 Peeks Hill Road	Ohatchee	AL	36271	10-Jun
Mr.	Laurence	Martin	3070 Peeks Hill Road	Ohatchee	AL	36271	10-Jun
Mr.	James E.	McNabb (USA-Ret)	154 Woodard Dr.	Oneonta	AL	35121	6-Jul
Mr.	Robert	Shelley	5088 Sumerville Road	Phenix City	AL	36860	10-Jun
Mr.	Earby S.	Markham	131 Wilson Drive	Spanish Fort	AL	36527	8-Jun
Mr.	Philip	Holmes	78 48 W. Lamur Rd.	Glendale	AZ	85303	2-Jul
Mr.	William S.	Coffman	859 Oxford Wy.	Benleta	CA	94510	8-Jul
	E.	Cooperrider	P.O. Box 942	Boonville	CA	95415	19-Jun
Mr.	Andy	Hammer	P.O. Box 848	Boonville	CA	95415	11-Jun
Mr.	Hani	Zubi	634 E. Harvard Rd. #3	Burbank	CA	91501	24-Jun
Ms.	E. Louise	O'Con	17700 S. Avalon Blvd #120	Carson	CA	90796	8-Jul
Mr.	Joseph R.	O'Con	17700 S. Avalon Blvd #120	Carson	CA	90796	8-Jul
Ms.	Lenora A.	Timm	25344 County Road 95	Dans	CA	95616	12-Jun
Ms.	Ann	Carlos	3438 Silver Maple Dr.	Danville	CA	94506	8-Jul
Mr.	J. Craig	Carlos	3438 Silver Maple Dr.	Danville	CA	94506	8-Jul
Mr.	Jon	Carlos	3438 Silver Maple Dr.	Donville	CA	94506	8-Jul
Ms.	Bev	MacDonald	1557 W. Orangethorpe #5	Fullerton	CA	92833	29-Jun
Mr.	Pete	MacDonald	1557 W. Orangethorpe #5	Fullerton	CA	92833	29-Jun
Ms.	Deborah	Klein	5691 Via De Mansion	La Verne	CA	91750	2-Jul
Mr.	Kenneth	Klein	5691 Via De Mansion	La Verne	CA	91750	2-Jul
	v. K.	Hudson	27 Pemberly	Mission Viejo	CA	92692	19-Jun
Ms.	Linda	Stiegmann	231 N. Maple Place	Montebello	CA	90640	8-Jul
Mr.	Michael	Stiegmann	231 N. Maple Place	Montebello	CA	90640	8-Jul
Mr.	J. William	Johnson	2240 Honolulu Ave	Montrose	CA	91020	16-Jun
Ms.	Vicki S.	Johnson	2240 Honolulu Ave.	Montrose	CA	91020	16-Jun
Mr.	Robert C.	Winters	2935 McKenzie Dr.	Richmond	CA	94806	25-Jun
	Viva Dean	Winters	2935 McKenzie Dr	Richmond	CA	94806	30-Jun
Mrs.	Eileen	Garson	5163 Willow Wood Rd.	Rolling Hills Est.	CA	90274	22-Jun
Mr.	Richard	Garson	5163 Willow Wood Rd.	Rolling Hills Est.	CA	90274	22-Jun
Mr.	Neil	Havlik	672 Serrana Dr., #11	San Luis Olsispo	CA	93405	25-Jun
Ms.	Elizabeth	Hathaway	1448 W. 9th Street #8	San Pedro	CA	90732	9-Jun
Mr.	John D.	Hathaway	1448 W. 9th Street #8	San Pedro	CA	90732	9-Jun
Ms.	Sherry	Moore	2302 Oak St.	Santa Monica	CA	90405	8-Jul
Mr.	Bill	Hopman	1436 Audrey Dr.	Tracy	CA	95376	30-Jun
Ms.	Debra	Hopman	1436 Audrey Dr.	Tracy	CA	95376	30-Jun
Mr.	Mike	Druding	2281 Ross Place		CA		15-Jun
	M. C.	Fell	7251 S. Homesteader Dr.	Morrison	CO	80465	17-Jun
Ms.	Sarah	Fell	7251 S. Homesteader Dr.	Morrison	CO	80465	16-Jun
Ms.	Carolyn K.	Evans	273 Legend Hill	Madison	CT	6443	9-Jun
Mr.	Ted	West	2815 North Street NW.	Washington	DC		10-Jun
Mr.	Kenneth J.	Raia	4 Old Flint Circle	Hockessin	DE	19707	2-Jul
Ms.	Carroll W.	Cooper	P.O. Box 1337	Ocean View	DE	19970	2-Jul
Ms.	Nancy	Cooper	P.O. Box 1337	Ocean View	DE	19970	2-Jul
Ms.	Linda	Everson Kasidic	P.O. Box 1300	Archer	FL	32618	11-Jun
Ms.	Carabeth D.	Johnson	809 E. High Street	Archer	FL	32618	10-Jun
Mr.	Robert	Kasicki	P.O. Box 1300	Archer	FL	32618	8-Jun
Ms.	LuAnne	Andringa	8299 Garden Gate Pl.	Bocakaton	FL	33433	26-Jun
Ms.	Beatrice	Cotellis	1411 29th Avenue W	Bradenton	FL	34205	18-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	Richard L.	Chapman	P.O. Box 1181	Brandon	FL	33509	11-Jun
Mr.	John	Thrush	Route 1, Box 683	Brycevilla	FL	32009	16-Jun
Mr.	Larry	Skinner	P.O. Box 209	Bryceville	FL	32009	16-Jun
Ms.	Jean P.	Beique	403 Polk Ave	Cape Canaveral	FL	32920	24-Jun
Mr.	Russ	Bensen	303 Fillmore Ave	Cape Canaveral	FL	32920	16-Jun
Mr.	Dan	Wendly	3665 E. Nai Rd.	Cayo	FL		16-Jun
Mr.	Leon W.	Cook	7710 C. R. 736	Center Hill	FL	33514	8-Jul
Ms.	Janet	Ledsome	597 S.E. Hwy 19	Crystal River	FL	34429	16-Jun
Mr.	Roy	Ensiminger	2709 Foxtail Ct.	DeLand	FL		19-Jun
Mr.	David J.	James	128 A Oak Dr.	Eglin AFB	FL	32542	30-Jun
	LaLoni	James	128 A Oak Dr.	Eglin AFB	FL	32542	30-Jun
Mr.	Robert H.	Snead	P.O. Box 707	Ft. Meade	FL	33841	16-Jun
	Len	Bartkowiak	Box 60231	Ft. Myers	FL	33906	18-Jun
Mr.	Tim	Hughes	672 Astanal Cir	Ft. Myers	FL	33919	15-Jun
Mr.	Gary	Quay	9301 NW. 9th Ave	Gainsville	FL	32606	16-Jun
Mr.	Harold	Gunter	Route 2 box 2075	Glen St. Mary	FL	32040	10-Jun
Mr.	Patrick	Kelley	3141 SW. 37th Ave	Hollywood	FL	33023	20-Jul
Ms.	Ellen	Conassi	97 D. Niemira Ave.	Indialantic	FL	32903	26-Jun
Mr.	John A.	Mayock, Jr.	97 D. Niemira Ave.	Indialantic	FL	32902	26-Jun
	S.	Allington		Jacksonville	FL		6-Jul
	Toney	Altieri	P.O. Box 24812	Jacksonville	FL	32241	16-Jun
Ms.	Corinne	Baglame	3361 Eve Dr. E.	Jacksonville	FL	32246	16-Jun
Mr.	James	Baglana	3361 Eve Dr. E.	Jacksonville	FL	32246	16-Jun
	Bobby	Beck	2024 Deer Run Tr.	Jacksonville	FL	32246	8-Jul
Mr.	John A.	Bunker	1307 San Mateo Ave	Jacksonville	FL	32207	16-Jun
Mr.	Mel	Carver	9441 Derby Acres Ln.	Jacksonville	FL	32220	16-Jun
Mr.	Keith	Cottrill	6535 Romilly Dr.	Jacksonville	FL	32210	8-Jul
Mr.	Burl	Davis	7016-2A Ponce De Leon Ave.	Jacksonville	FL	32217	8-Jul
Mr.	Ken R.	Giddens	4632 Birkenhead Road	Jacksonville	FL	32210	10-Jun
	K. R.	Lindquist		Jacksonville	FL		8-Jul
Mr.	Dave	Nelson	6140 St. Augustine Rd	Jacksonville	FL	32217	16-Jun
Mr.	Matt	Robbins	8443 San Martano Dr. W.	Jacksonville	FL	32217	24-Jun
Ms.	Robin	Robbins	8443 San Martano Dr. W.	Jacksonville	FL	32217	24-Jun
	B.	Stephens	10418 Marble Egret Dr.	Jacksonville	FL	32257	16-Jun
Ms.	Linda	Wigosz	10924 Oak Ridge Dr. S.	Jacksonville	FL	32225	16-Jun
Mr.	Chris	Tolbert	136 Gulfstream Dr.	Jupiter	FL	33469	8-Jul
Ms.	Madeleine	Burnside	536 White St.	Key West	FL	33040	9-Jul
Ms.	Joyce	Day	2605 Walker Road	Lakeland	FL	33810	11-Jun
Ms.	Christina C.	Tatum	23051 NW. CR 200 A	Lawtly	FL	32058	8-Jul
Mr.	John W.	Tatum	23051 NW. CR 200 A	Lawtly	FL	32058	8-Jul
Ms.	Debra	Cavanah	1100 College Dr.	Madison	FL	32340	16-Jun
Mr.	James L.	Cavanah, II	1100 College Dr.	Madison	FL	32340	16-Jun
Mr.	Doug	Miller	5530 Lakeside Drive	Margate	FL	33063	16-Jun
Mr.	Raymond A.	Meinberg	319 SW. 76 Terrace	N. Ft. Lauderdale	FL	33068	14-Jul
Mr.	Jim	Schmidt	16308 Lake G.	Odem	FL	33556	16-Jun
Ms.	Debbie	Clark	220 Stone Ave #23	Orange Park	FL	32073	8-Jul
Mr.	D.J.	Barth	12155 Sandpebble Way	Orlando	FL		16-Jun
Ms.	Joan	Barth	12155 Sandpebble Way	Orlando	FL		16-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	John	Craig	4322 Anderson Rd.	Orlando	FL	32812	25-Jun
Mr.	Ed	Sexton	6218 Chinaberry Dr.	Orlando	FL	32808	16-Jun
Ms.	Linda	Sexton	6218 Chinaberry Dr.	Orlando	FL	32808	16-Jun
	C. W.	Sheffield	4322 Anderson Road	Orlando	FL	32812	8-Jun
	M. L.	Deelen	105 Jamestown Dr.	Ormond Beach	FL	32176	19-Jun
Ms.	Sandra	Miller	3289 Fairfax NE.	Palm Bay	FL	32905	30-Jun
	Sidney	Miller	3259 Fairfax NE.	Palm Bay	FL	32905	29-Jun
Ms.	Debbie	Joslyn	10046 Fox Fire Place	Pensacola	FL	32514	14-Jul
Mr.	Mike	Joslyn	10046 Fox Fire Place	Pensacola	FL	32514	14-Jul
Mr.	Guy	DiCarlo, Jr.	104 Buck Island Court	Ponte Vedra Beach	FL	32082	15-Jun
Ms.	Virginia	Raszewski	10050 88th Street North	Saminole	FL	33777	10-Jun
Mr.	John	Nelson	6260 Media Ct. #102	Senesote	FL		17-Jun
Mr.	Charles	Dale	1108 Prince Rd.	St. Augustine	FL	32086	25-Jun
Mr.	Ryan J.	Wallace	4 Talavera Ct.	St. Augustine	FL	32086	6-Jul
Mr.	Alec	Fleming	2865 Godwin Rd.	St. Cloud	FL	34777	8-Jul
Ms.	Marilyn	Ortiz	9331 N. 43 St	Sunrise	FL	33351	15-Jun
Mr.	Paul	Sampson	1128 Victory Garden Dr.	Tallahasee	FL	32301	16-Jun
Mr.	Alan	Wonuman	954 Richardson Rd.	Tallahassee	FL	32301	16-Jun
Mr.	Joel Craig	Bostic	1403 E. Elm St.	Tampa	FL	33604	17-Jun
Ms.	Gail	Myers	13305 Meadow Wood Court	Tampa	FL	33624	9-Jun
Ms.	Lea Ann	Wimmert	9601 Orange Grove Drive	Tampa	FL	33618	9-Jun
Mr.	Greg	Tolbert	136 Gulfstream Dr.	Tequesta	FL	33469	8-Jul
	Renee	Tolbert	136 Gulfstream Dr.	Tequesta	FL	33469	8-Jul
Mr.	Billie	Aldridge	6020 Whispering Lane	Titusville	FL	32780	24-Jun
Mr.	Glenn	Lashley	2503 Rivier Dr.	Titusville	FL	32780	30-Jun
Ms.	Shirley	Lashley	2503 Rivier Dr.	Titusville	FL	32780	30-Jun
Mr.	Jerry	Vaughn	9291 NE 144th Terrace	Williston	FL	32696	10-Jun
Mr.	Donald O.	Casey	567 Plainview Road SE.	Adairsville	GA	30103	10-Jun
Ms.	Barbara	Chastain	P.O. Box 712	Adairsville	GA	30103	6-Jul
Mr.	Robert	Garland	P.O. Box 523	Adairsville	GA	30103	22-Jun
Mrs.	Christine	Jefty	112 Cheron St.	Adairsville	GA	30103	15-Jun
Mr.	Robert	Jefty	112 Cheron St.	Adairsville	GA	30103	15-Jun
Mr.	Erun	Gamto	Route 1 Box 184A	Adrian	GA	31002	15-Jun
Mr.	Wayne	Furman	6013 James Drive	Albany	GA	31705	11-Jun
Ms.	Faith	Coomes	1275 Hopewell Crest	Alpharetta	GA	30004	25-Jun
Mr.	Joe	Coomes	1275 Hopewell Crest	Alpharetta	GA	30004	25-Jun
Mr.	James W.	Phillips	14150 Hopewell Rd.	Alpharetta	GA	30004	15-Jun
Mr.	Richard S.	White	330 Gunston Hall Circle	Alpharetta	GA	30004	17-Jun
Mr.	Phillip	Whiteman	2032 Eagle Glen Road	Alpharetta	GA	30022	15-Jun
Ms.	Linda P.	Aaron	P.O. Box 80614	Athens	GA	30608	19-Jun
Mr.	Goodloe Y.	Erwin	354 Milledge Cir.	Athens	GA	30606	15-Jun
Mr.	David	Evans	140 Baxter Drive Apt H4	Athens	GA	30606	22-Jun
Mr.	Joe	Gaines, MD	165 Walton Creek Rd.	Athens	GA	30607	16-Jun
COL	Clyde E.	Noble	766 Riverhill Drive	Athens	GA	30606	9-Jun
Mrs.	Grace	Noble	801 Riverhill Dr./Lanier Gardens	Athens	GA	30606	19-Jun
Ms.	Dorothy	Alson	431 Capitol	Atlanta	GA	30334	17-Jun
Mr.	D.H.	Armstrong	PO Box 28642	Atlanta	GA	30328	16-Jun
Mr.	Phil	Autrey	416 Candler St. NE.	Atlanta	GA	30307	6-Jul
Mr.	John Sammons	Bell	3072 Argonne Dr. NW.	Atlanta	GA	30305	17-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	Donald	Browne	255 Abington Dr. NE.	Atlanta	GA	30328	24-Jun
Mr.	James F.	Bush	3993 Pinehill Pl. NW.	Atlanta	GA	30342	24-Jun
Mr.	Barry L.	Cox	3685 Briarcliff Road	Atlanta	GA	30345	15-Jun
Mr.	Brown	Dennis, MD	76 Palisades Rd.	Atlanta	GA	30309	22-Jun
Mr.	Clyde	Downing	306 Hascall Rd., NW.	Atlanta	GA	30309	6-Jul
Mr.	Todd B.	Frary	P.O. Box 420142	Atlanta	GA	30342	15-Jun
Mr.	Byron A.	gilbreath	1016 Kentucky Ave.	Atlanta	GA	30308	30-Jun
Mr.	Randolph	Goulding	1031 Wadsworth Dr. NW.	Atlanta	GA	30318	2-Jul
Mrs.	Randolph	Goulding	1031 Wadsworth Dr. NW.	Atlanta	GA	30318	2-Jul
Ms.	Amy	Henderson	292 Midvale Dr.	Atlanta	GA	30342	15-Jun
Mr.	Leonard	Hultquist	2690 Habersham Rd.	Atlanta	GA	30305	18-Jun
Mr.	Jim	Jensen	87 Howard St.	Atlanta	GA		1-Jul
Mr.	John D.	Johnson	825 Moores Mill Rd.	Atlanta	GA	30327	15-Jun
Mr.	Oliver J.	Keller	1150 Peachtree Battle Avenue NW.	Atlanta	GA	30327	9-Jul
Mr.	O. J.	Keller, Jr.	1150 Peachtree Battle Ave., NW.	Atlanta	GA	30327	8-Jul
Ms.	Susan	Kidd	1898 Wycliff Road #11	Atlanta	GA	30309	9-Jun
Mr.	Michael	Leaf	P.O. Box 53472	Atlanta	GA	30355	8-Jul
COL	Floyd W.	Mc Rae, Jr.	3075 Habersham Rd. NW.	Atlanta	GA	30305	17-Jun
Mr.	Kevin	McCauley	551 Chateagay Lane	Atlanta	GA	30342	23-Jun
Mr.	Gary Reed	Moss	3662 Briarcliff Rd	Atlanta	GA	30345	22-Jun
Mr.	Bart	Norman	921 Glen Droven Way	Atlanta	GA	30306	24-Jun
Mr.	John H.	Olden	4027 Glen Deron Drive	Atlanta	GA	30327	15-Jun
Mr.	Jane	Powers Weldon	1393 Harvard Rd. NE.	Atlanta	GA	30306	22-Jun
Mr.	David	Raith	1432 Cornell Road	Atlanta	GA	30306	15-Jun
Ms.	Karen	Ross, Ph.D.	93 Delmont Dr., NE.	Atlanta	GA	30305	6-Jul
Ms.	Linda	Serrano	3600 Shallow Ford Rd E-1	Atlanta	GA	30341	8-Jul
Mr.	H.A.	Stephens, Jr.	2928 Rockingham Dr. NW.	Atlanta	GA	30327	16-Jun
Mr.	Gregoree Chon	Stevenses	3044 B. Rd. #1	Atlanta	GA	30329	2-Jul
Mr.	Phil	Stomu	1062 Winding Branch Ct.	Atlanta	GA	30338	10-Jul
Mr.	L. Jack	Swertfeger, Jr.	1363 N. Decatur Rd.	Atlanta	GA	30306	17-Jun
COL	Henry	Taylor (RET)	361 Blanton Rd., NW.	Atlanta	GA	30342	24-Jun
Mr.	John W.	Thomas	2783 Mabry Rd., NE	Atlanta	GA	30319	18-Jun
Ms.	Maxine	Turner	Box 5267	Atlanta	GA	31107	17-Jun
Mr.	David	Williams	1162 Brookgate Way	Atlanta	GA	30319	15-Jun
Ms.	Kathy	Williams	1162 Brookgate Way	Atlanta	GA	30319	15-Jun
Mr.	Robert E.	Zaworski, M.D.	980 Johnson Ferry Rd N.E. Suite 450	Atlanta	GA	30342	15-Jun
Ms.	Margaret	Mason	2061 Blackberry Ln.	Auburn	GA	30611	16-Jun
	E. Randall	Flyd	Harbor House 3010 Stratford Dr.	Augusta	GA	30909	17-Jun
Mr.	William	Muse	3109 Bransford Rd.	Augusta	GA	30909	22-Jun
	R. A.	Sanders	2571 Mt. Auburn St.	Augusta	GA	30904	16-Jun
Mr.	Bob	Young	1058 Hickman Rd.	Augusta	GA	30904	15-Jun
Mr.	Douglas R.	Davis	5925 Mulberry St.	Austell	GA	30168	15-Jun
Mr.	Gary	Smith	1449 Oak Ridge Road	Austell	GA	30168	15-Jun
Mr.	James O.	Wynn	1572 Greenbrook Dr.	Austell	GA	30168	18-Jun
Ms.	Trisha	Warren	6883 Cochran Rd.	Austen	GA	30168	15-Jun
Ms.	Estelle	Ford-Williamson	3191 Rockbridge Road	Avondale Estates	GA	30002	9-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	Richard R.	Williamson	3191 Rockbridge Road	Avondale Estates	GA	30002	9-Jun
Mr.	John T.	Flammer	441 Coker Drive	Ball Ground	GA	30107	15-Jun
Mr.	Bill	Perrin	4427 Hightower Rd.	Ballground	GA	30107	30-Jun
Mr.	Ted P.	Craven	4219 Lennox Rd	Baxley	GA	31513	16-Jun
Mr.	Charles A.	Johnson	P.O. Box 775	Baxley	GA	31513	16-Jun
Mr.	Donald E.	Lodge	547 Big Canoe	Big Canoe	GA	30143	18-Jun
	Lannis	Deal	4076 Elm Rd.	Blackshear	GA	31516	25-Jun
Mr.	Emory	Perkins	1232 Indian Trail	Blackshear	GA	31516	24-Jun
Ms.	Sharon	Perkins	1232 Indian Trail	Blackshear	GA	31516	24-Jun
Mr.	William M.	Decker	7938 Beaver Run Rd.	Blairsville	GA	30512	26-Jun
Ms.	Linda	Carper	P.O. Box 46	Bloomingdale	GA	31302	15-Jun
	Tony	Giroux	412 Ash St.	Bloomingdale	GA	31302	17-Jun
Ms.	Megan	Hughes	311 South Walnut Street	Bloomingdale	GA	31302	16-Jun
Ms.	Rosemary	Hughes	311 S. Walnut St.	Bloomingdale	GA	31302	16-Jun
Mr.	Harny W.	Hughes, Sr.	311 S. Walnut St.	Bloomingdale	GA	31302	16-Jun
Mr.	William	Kersey	Deerfield Rd.	Bloomingdale	GA	31302	23-Jun
Mr.	George A.	Lowman, Jr.	107 Cherry St	Bloomingdale	GA	31302	16-Jun
Ms.	Karen	Sikes	131 Cape Fear Dr.	Bloomingdale	GA	31302	16-Jun
Mr.	Willard	Sikes	Rt 4, Box 293-B	Bloomingdale	GA	31302	25-Jun
Mr.	Richard	Slater	2867 U.S. Hwy 80	Bloomingdale	GA	31302	16-Jun
Mr.	Steven	Smith	188 Oak Crove Rd.	Bloomingdale	GA	31302	16-Jun
Mr.	Joe	Sikes	131 Cape Fear Dr.	Bloomingdale	GA	31320	16-Jun
Mr.	James	Bath	4100 Old River Rd. S.	Brooklet	GA	30415	25-Jun
Mr.	John	Cashion	746 Aroca Villa Rd.	Brunswick	GA	31523	15-Jun
	T. L.	Hensler	878 Timber Landing Tr.	Brunswick	GA	31525	16-Jun
Mr.	Larry W.	Latham, Sr.	3875 Darien Hwy, Apt. #7-H	Brunswick	GA	31525	8-Jun
Mr.	William	Studdard, CPA	1128 Kings Cross	Brunswick	GA	31525	19-Jun
Mr.	Joseph	Westbrook	190 Roxanne St.	Brunswick	GA	31525	16-Jun
Mr.	Billy D.	Sharp	5741 Harbor Dr.	Buford	GA	30518	9-Jul
Mr.	Dalton	Sharp	5741 Harbor Dr.	Buford	GA	30518	9-Jul
Ms.	Gail L.	Sharp	5741 Harbor Dr.	Buford	GA	30518	9-Jul
Ms.	Cheryl	Johnson	1432 Dunbar Rd.	Byron	GA	31008	8-Jul
Mr.	Winfred	Gray Sr.	1332 US 41 South	Calhoun	GA	30701	16-Jun
	Ashley	Purvis	211 Ivey Dr. NW.	Calhoun	GA	30201	19-Jun
Ms.	Tammy	Parker	20 West Stephens St.	Camilla	GA	31730	16-Jun
Mr.	Donald	Floyd	1270 New Franklin Rd.	Canon	GA	30520	15-Jun
	Edie Kay	Floyd	1270 New Franklin Rd.	Canon	GA	30520	15-Jun
Ms.	Rachael	Waldrep	45 Muddy Branch Ct.	Canon	GA	30520	16-Jun
Mr.	Bruce	Purvis	567 Stillbranch Dr.	Canton	GA	30115	17-Jun
Mr.	Jerry K.	Wood	1143 Beavers Rd.	Canton	GA	30115	17-Jun
Mr.	James Howard	Johnson	101 West Lakeshore Dr.	Carrollton	GA	30117	17-Jun
	Lewis H.	Larson	State University of West GA	Carrollton	GA	30118	19-Jun
Ms.	Sandra M.	Cunningham	27 Country Lane SE.	Cartersville	GA	30121	6-Jul
Mr.	Steve	Fubbington	7 Roving Hills Cir., SE.	Cartersville	GA	30121	6-Jul
Mr.	Gary W.	Glaze	948 Grassdale Rd. NW.	Cartersville	GA	30121	6-Jul
	Cherry	Horn	27 Oakdale Dr.	Cartersville	GA	30120	6-Jul
Ms.	Mildred	Jones	4 Oakdale Dr.	Cartersville	GA	30120	6-Jul
Ms.	Faye	Knight	107 Georgia Blvd.	Cartersville	GA	30120	6-Jul
Mr.	Donald L.	Myers	100 Dover Road, NW	Cartersville	GA	30120	18-Jun
Ms.	Barbara	Partain	1465 Douthit Ferry Rd.	Cartersville	GA	30120	6-Jul

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Ms.	Martha	Stone	17 Roving Hill Cr.	Cartersville	GA	30121	6-Jul
Ms.	Carol	Webb	185 Walker Rd.	Cartersville	GA	30121	6-Jul
Mr.	David G.	Archer	43 Robin Dr.	Carterville	GA	30120	1-Jul
Ms.	Ellen	Archer	43 Robin Dr.	Carterville	GA	30120	1-Jul
Mr.	Larry E.	White	52 Fannen St. P.O. Box 645	Cave Spring	GA	30124	17-Jun
Mr.	Robert L.	Johnson	P.O. Box 309	Chickamauga	GA	30707	10-Jun
Mr.	Mary Ellen	Johnson	P.O. Box 309	Chickamaya	GA	30707	9-Jun
Ms.	Pat	Reynolds	216 Carolyn St.	Church Hill	GA	37642	25-Jun
Mr.	Peter	Strickland	Route 4 Box 8	Claxton	GA	30417	16-Jun
	R. R.	Tippins	204 S. Spring St.	Claxton	GA	30417	16-Jun
Mr.	Wes	Tippins	Rt. 2 Box 35B	Claxton	GA	30417	16-Jun
Mr.	Ira S.	Wamble, Jr.	402 Perry St.	Claxton	GA	30417	18-Jun
Mr.	Risher	Willard	306 W. Liberty Street	Claxton	GA	30417	2-Jun
Ms.	Tally S.	Willard	306 W. Liberty Street	Claxton	GA	30417	2-Jun
CPT	Paul	Wimmer	RR 2 Box 2105A	Clayton	GA	30525	18-Jun
Mr.	Thomas W.	Hayes, Sr.	42 Ridgewood Dr.	Cleveland	GA	30528	18-Jun
	Sonny	Giddens	1122 Lamaz Rd.	Cochgan	GA	31014	16-Jun
Mr.	John M.	Dykes, Sr.	1116 North Lake Shore Dr.	Cochran	GA	31014	15-Jun
Ms.	Connie R.	Godin	1122 Lamer Dr.	Cochran	GA	31014	16-Jun
Mr.	Moses B.	Kohn	639 Garden Walk Bldv. #722	College Park	GA	30349	8-Jul
Mr.	Billy J.	Burkes	4110 2nd Avenue	Columbus	GA	31904	15-Jun
Mr.	Andrew C.	Dodgen	5650 Winvelly Drive	Columbus	GA	31909	8-Jun
Mr.	Paul	McNahl	5821 Windsor Drive	Columbus	GA	31909	18-Jun
M+r.	Thomas	Benefield	PO Box 22	Conley	GA	30288	16-Jun
Mr.	Robert E.	Waters	1241 Maple St.	Conners	GA	30013	17-Jun
Mr.	Frank L.	Stalling	2581 Lakeshore Dr. NE>	Conyers	GA	30012	6-Jul
Mr.	Thomas L.	Parham	95 Russell Dr.	Covington	GA	30014	16-Jun
Mr.	Gregory G.	Allen	2025 Crescent Ridge	Cumming	GA	30041	30-Jun
Mr.	Donald A.	Herrick	2130 Nottingham Wy.	Cumming	GA	30040	18-Jun
Mr.	George B.	Allen	107 Hickory Knoll	Cummung	GA	30040	15-Jun
Mr.	Gus	Valer	1715 Windsong Park Dr.	Dacula	GA	30019	18-Jun
Mr.	Norman	Dasinger, Jr.	224 Hart Circle	Dallas	GA	30132	15-Jun
Mr.	Dave	Ingman	187 Davis Mill Hollow	Dallas	GA	30132	18-Jun
Mr.	Jackie W.	Strickland	2957 Marietta Highway	Dallas	GA	30132	9-Jun
Mrs.	Pauline R.	Strickland	1571 Marietta Highway	Dallas	GA	30132	9-Jun
Mr.	Andy	Babb	2666 Dug Gap Rd. SW.	Dalton	GA	30720	22-Jun
Mr.	William M.	Blackman, MD	1717 Briarcliff Circle	Dalton	GA	30720	17-Jun
Ms.	Carolyn	Hodges	Box 1526	Darien	GA	31305	17-Jun
Mr.	John	Keys	307 Adair Street, Unit C-3	Decatur	GA	30030	25-Jun
Mr.	David	O'Connell	225 Upland Rd.	Decatur	GA	30030	25-Jun
Ms.	Gail	Wrigth	565 Collingwood Drive	Decatur	GA	30032	15-Jun
Mr.	Thomas R.	Cave	4426 Redwood St.	Doraville	GA	30360	15-Jun
	Orlando	Botello	308 E. Jefferson Street	Douglas	GA	31533	19-Jun
Mr.	Todd	Womack	108 West Franklin Street	Douglas	GA	31533	16-Jun
Mr.	Daniel S.	Roy	3617 Players Court	Douglasville	GA	30135	25-Jun
	Bonnie	Spiva	4331 Kings Hwy	Douglasville	GA	30135	6-Jul
Mr.	Danny	Spiva	4331 King's Hwy	Douglasville	GA	30135	6-Jul
Mr.	Robert F.	Steele	120 Springlaurel Ct.	Duluth	GA	30097	24-Jun
Mr.	Chris	Brooks	1735 Kings Down Circle	Dunwoody	GA	30338	11-Jun
Mr.	Thomas E.	Goolsby	4587 Kingsgate Dr.	Dunwoody	GA	30338	22-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	Charles	Mosby	2375 Jackson Dr.	East Point	GA	30344	15-Jun
Mr.	Sam	Mincey	PO Box 504	Eden	GA	31307	25-Jun
	L. H.	Peavy, Sr.	P.O. Box 805	Eden	GA	31307	23-Jun
Mr.	Ward	Chastain	413 Hickory Dr.	Elberton	GA	30635	17-Jun
Mr.	Terry M.	Johnson	2363 Washington Hyw.	Elberton	GA	30635	15-Jun
Ms.	Kimmy	Collins	140 Kings Way	Ellabell	GA	31308	25-Jun
Mr.	Greg	Hatcher	276 Pevey Rd.	Ellabell	GA	31308	16-Jun
Ms.	Stephanie	Miller	P.O. Box 32	Ellabell	GA	31308	17-Jun
Ms.	Nina	Turner	431 Stubbs Lane	Ellabell	GA	31308	16-Jun
Mr.	Walter W.	Turner	431 Stubbs Lane	Ellabell	GA	31308	16-Jun
Ms.	Vicki	Justice	P.O. Box 181	Ellaville	GA	31806	15-Jun
Mr.	Wilbur	Justice	P.O. Box 181	Ellaville	GA	31806	15-Jun
Mr.	William J.	Cavender	P.O. Box 386	Eton	GA	30724	17-Jun
Mrs.	William J.	Cavender	P.O. Box 386	Eton	GA	30724	17-Jun
Mr.	James	North	4560 Betty's Branch Way	Evans	GA	30809	18-Jun
Mr.	James	North	4560 Betty's Branch Way	Evans	GA	30809	1-Jul
Mrs.	E. L.	Bolin	115 Horseshoe Cir.	Fayetteville	GA	30215	16-Jun
Mrs.	Carolyn J.	Cary	P.O. Box 495	Fayetteville	GA	30214	15-Jun
Dr.	Edgar	Bolin	115 Horseshoe Cir.	Fayettville	GA	30215	16-Jun
Mr.	Johnie R.	Winn	130 N. Main Ext.	Fitzgerald	GA	31750	23-Jun
Ms.	Kelley	McKenzie	734 Pate Rogers Road	Fleming	GA	31309	16-Jun
Ms.	Elizabeth	Lyon	PO Box 1269	Flowery Branch	GA	30542	18-Jun
Mr.	Freeman	Farr	5403 Union church Rd.	Flowory Branch	GA	30542	15-Jun
	Rogena	Sheppard	Rt. 1 Box 2830	Folkston	GA	31537	17-Jun
Mr.	James B.	Bonham, III	1063 Shieldcrest Way	Forest Park	GA	30297	15-Jun
Ms.	Marie L.	West	4512 Montclair Dr.	Forest Park	GA	30297	30-Jun
Mr.	H. Truett	Goodwin, Jr.	1214 Forsyth Landing Dr.	Forsyth	GA	31029	17-Jun
Mr.	Irby	Jones	150 Riverview Road	Franklin	GA	30217	16-Jun
Ms.	Rosemary	Jones	150 Riverview Road	Franklin	GA	30217	16-Jun
Mr.	Randall R.	Caruso	123 Sig Bn	Ft. Stewart	GA	31314	16-Jun
Ms.	Colleen M.	Hill	7056 #E Subic Circle	Ft. Stewart	GA	31315	8-Jul
Mr.	Richard A.	Hill	7056 Subic Cir apt E.	Ft. Stewart	GA	31315	8-Jul
Mr.	Harris	Flanders	214 Dean Forest Rd.	Garden City	GA	31408	25-Jun
Mr.	Steven D.	Hibberts	324 Griffin Ave.	Garden City	GA	31408	18-Jun
Mr.	Alan	Lamb	4613 Old Louisville Rd.	Garden City	GA	31408	25-Jun
Ms.	Catherine	Lamb	4613 Old Louisville Rd.	Garden City	GA	31408	25-Jun
Mr.	Richard H.	McAuley	145 Rommel Ave.	Garden City	GA	31408	30-Jun
	M.	McMichael	Apt 304 Wyndmere Place	Garden City	GA	31408	17-Jun
Ms.	Leisa	Neal	2303 Spivey Avenue	Garden City	GA	31408	16-Jun
Mr.	Terry	Young	2303 Shaw Avenue	Garden City	GA	31408	16-Jun
Ms.	Rebecca	Bernardo	201 N. Henry	Glennville	GA	30427	23-Jun
Ms.	Melissa	Fitzgerald	Route 3 Box 2570	Glennville	GA	30427	16-Jun
Mr.	Michael	Fitzgerald	Rt. 3 Box 2570	Glennville	GA	30427	16-Jun
Mr.	Tom	Perry	Route 1 box 28	Glennville	GA		2-Jul
Mr.	Thomas	Perry	Route 1, Box 28	Glenville	GA	31407	16-Jun
Mr.	Jim B.	Grantham	Rt. 2 Box 1870	Gray	GA	31032	16-Jun
Ms.	Anne B.	Hamilton	RFD #5 Box 143	Gray	GA	31032	17-Jun
Ms.	Judith	Drapeau	560 Flowring Trl	Grayson	GA	30017	8-Jul
Mr.	Fred	Roney	124 Sunset Strip Rd.	Griffin	GA	30224	16-Jun
Ms	Jane	Roney	124 Sunset Strip Rd.	Griffin	GA	30224	16-Jun
Mr.	E. Marvin	Thomas	647 Brook Cir.	Griffin	GA	30224	24-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Ms.	Susan	Meeks	2257 Blue Jay Road	Guyten	GA	31312	16-Jun
Mr.	Donald	Cannon	441 Hodgeville Road	Guyton	GA	31312	16-Jun
Ms.	Margaret	Carmer	441 Hodgeville Rd	Guyton	GA	31312	16-Jun
Mr.	Scott	Dubois	117 Scholar	Guyton	GA	31312	15-Jun
Mr.	Phil	Hanakes	5287 Hwy 17	Guyton	GA	31315	15-Jun
Mr.	Winton	Howard	566 McLaw Rd.	Guyton	GA	31312	25-Jun
Mr.	Colan V.	Hutson	311 Zettler Loop	Guyton	GA	31312	16-Jun
Mr.	Alan	Meeks	2257 Blue Jay Road	Guyton	GA	31312	16-Jun
Mr.	S. Dwayne	Pack	153 Sherouse Rd.	Guyton	GA	31312	25-Jun
Mr.	Harold A.	Partin, Jr.	370 Springfield Tusculum Rd.	Guyton	GA	31312	2-Jul
Mr.	Julius L.	Pippin	501 Marlow Rd.	Guyton	GA	31312	25-Jun
Ms.	Susan	Prescott	204 Allison Rd.	Guyton	GA	31312	2-Jul
Mr.	Larry	Saxon	P.O. Box 123	Guyton	GA	31312	17-Jun
Mr.	Greg	Short	253 Scuffletown Rd.	Guyton	GA	31312	15-Jun
Ms.	Rhonda	Shot	253 Scuffletown Rd.	Guyton	GA	31312	15-Jun
Mr.	Roy	Wendelken	1748 Pleasant Acres Rd.	Guyton	GA	31312	25-Jun
Mr.	Andrew C.	Miller	Rt. 1, Box 249	Haddock	GA	31033	18-Jun
Mr.	Anthony	Blackburn	320 South Dr.	Hampton	GA	30228	8-Jul
Mr.	Wendell A.	Gresham	6132 Veterans Dr.	Harlem	GA	30814	17-Jun
	B. H.	Claxton	Rt. 5 Box 294	Hazlehurst	GA	31539	10-Jul
Ms.	Andrea M.	Harris	3509 F Oak View Place	Hephzibah	GA	30815	8-Jul
	G. Roy	Lockwood, Ph.D.	Box 770	Hiawassee	GA	30546	15-Jun
Ms.	Sharon	Churchwell	618 Ogden Ave	Hinesville	GA	31313	7-Jul
Ms.	Jennifer	Crigger	900 Bradwell	Hinesville	GA	31313	16-Jun
Mr.	Kelly	Crigger	900 Bradwell	Hinesville	GA	31313	16-Jun
Mr.	Kevin	Farley	1110 Cobra Circle	Hinesville	GA	31313	18-Jun
Ms.	Martha B.	Farley	1110 Cobra Circle	Hinesville	GA	31313	18-Jun
Ms.	Anne	Garozzo	132 Deann Dr.	Hinesville	GA	31313	16-Jun
Mr.	David	Gaston	375 Davis Road #7	Hinesville	GA	31313	16-Jun
Mr.	Jim J.	Gray	624 south Main St	Hinesville	GA	31313	16-Jun
Mr.	Paul	Hebert	512 Wellington Way	Hinesville	GA	31313	25-Jun
Mr.	Bruce	Kent	356 Margaret Rd.	Hinesville	GA	31313	17-Jun
Ms.	Ginger	Maddox	1343 W. Oglethorpe Hwy #3	Hinesville	GA	31313	16-Jun
Mr.	Paul E.	Marion	2580 Zachary Court	Hinesville	GA	31313	10-Jun
Ms.	Sandra	Pope	P.O. Box 2072	Hinesville	GA	31310	16-Jun
Ms.	Barbara	Porter	132 Dearn Dr.	Hinesville	GA	31313	16-Jun
Mr.	Ken	Porter	132 Deann Dr.	Hinesville	GA	31313	16-Jun
Mr.	Rick	Price	233 Maple Dr. S.	Hinesville	GA	31313	16-Jun
Mr.	David	Silvius	847 Lyndsi Ln.	Hinesville	GA	31313	16-Jun
Mr.	David	Swinford	662 Mahoney Rd.	Hinesville	GA	31313	16-Jun
	Myers	Brown	1495 Hiram Sudie Rd.	Hiram	GA	30141	17-Jun
Ms.	Frances	Jennings	P.O. Box 95	Hiram	GA	30141	8-Jun
Mr.	M. J.	Jennings	P.O. Box 95	Hiram	GA	30141	8-Jun
	K.	Mobley	P.O. Box 1745	Hiram	GA	30141	16-Jun
Ms.	Diane	Robinson	P.O. Box 250	Hiram	GA	30141	15-Jun
Mr.	Keith C.	Southern	1344 Cochran Ridge Rd.	Hiram	GA	30141	16-Jun
Mr.	William E.	Smith	115 Riverside Road	Jackson	GA	30233	15-Jun
	Sidney H.	Watts	260 Biles Road	Jackson	GA	30233	8-Jun
Mr.	Charles	Geiger	2300 Yanoo Trace	Jasper	GA	30143	16-Jun
Mr.	Frank C.	Gilbert	177 Hickory Hollow Dr.	Jefferson	GA	30549	19-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
	Chip D.	Craven	615 S. Elm St.	Jesup	GA	31546	16-Jun
Ms.	Katey	Phillips	2485 Mahogany St.	Jesup	GA	31546	16-Jun
Mr.	John	Guss	495 Oglethorpe Square Apt N	Jonesboro	GA	30236	15-Jun
Mr.	Chuck	Johnson	2695 Emerald Dr.	Jonesboro	GA	30231	16-Jun
Ms.	Debbie	Epps	523 Pates Rd.	Julie	GA	31046	30-Jun
Mr.	Mike H.	Buchner	Rt. 1, Box 76	Junction City	GA	31812	18-Jun
Ms.	Betty Anne	Buckner	Route1 Box 81	Junction City	GA	31812	9-Jun
Mr.	John	Buckner	Route 1 Box 76	Junction City	GA	31812	8-Jun
Mr.	Josh E.	Buckner	Route 1 Box 76	Junction City	GA	31812	8-Jun
Mr.	Mike H.	Buckner	Route 1 Box 76	Junction City	GA	31812	8-Jun
Mr.	William Harvey	Buckner, Jr.	Route 1 Box 81	Junction City	GA	31812	9-Jun
Mr.	Willie	Sanders	Rt. 1, Box 77	Junction City	GA	31812	18-Jun
Mr.	Willie F.	Sanders	Route 1 Box 77	Junction City	GA	31812	9-Jun
Mrs.	Edna	Searcy	P.O. Box 85	Junction City	GA	31812	8-Jun
Mr.	Mark B.	Bullman, Esq.	4048 Willowmere Trail	Kennesaw	GA	30144	23-Jun
Mr.	James T.	Dale	3983 Cripple Creek Drive	Kennesaw	GA	30144	15-Jun
Mr.	Kenneth	Macaluso	2536 Kennesaw Dr.	Kennesaw	GA	30152	1-Jul
	Aticha	McQueen	3780 Town Crossing #113	Kennesaw	GA	30144	6-Jul
Mr.	James G.	Moore	266 Mossy Way	Kennesaw	GA	30152	15-Jun
Ms.	Robin	Riddle	1581 Greers Chapel Road	Kennesaw	GA	30152	8-Jun
Mr.	Scott	Riddle	1581 Greers Chapel Road	Kennesaw	GA	30152	8-Jun
Dr.	Philip L.	Secrist	835 Frank Kirk Rd.	Kennesaw	GA	30152	19-Jun
Ms.	Sandie	Macaluso	2536 Kennesaw Dr.	Kennesaw	GA	30152	1-Jul
Ms.	Pat	Betchik	814 Griffin Bluff Rd.	Kingsland	GA	31548	16-Jun
Ms.	Betty	Brazell	814 Griffin Bluff Rd.	Kingsland	GA	31548	16-Jun
Ms.	NaDean	Moore	Route 1, Box 35	Kite	GA	31049	16-Jun
Mr.	Randy	Moore	Rt. 1, Box 35	Kite	GA	31049	16-Jun
Mr.	Charles L.	Wood, Sr.	321 Laurel Ln	Lagrange	GA	30241	17-Jun
Ms.	Alice	Franklin	HC 10 Box 232	Lakemont	GA	30552	30-Jun
Ms.	Dale	Kilby	HC 10 Box 232	Lakemont	GA	30552	29-Jun
Ms.	Pam	Kilby	HC 10 Box 232	Lakemont	GA	30552	30-Jun
Ms	Dale	Jane'	985 Burycove Lane	Lawrenceville	GA	30043	15-Jun
Mr.	Warren	Jane'	985 Burycove Lane	Lawrenceville	GA	30043	15-Jun
Mr.	Gerald A.	McGowan	1421 Omie Way	Lawrenceville	GA	30043	18-Jun
Ms.	Donna	Menefee	164 D Maddox St.	Lawrenceville	GA	30045	30-Jun
Mr.	Jason	Menefee	164 D Maddox St.	Lawrenceville	GA	30045	30-Jun
Mr.	Gerard R.	Nacin	396 Ridgedale Way	Lawrenceville	GA	30244	15-Jun
	J.H.	Segars	340 Regal Dr.	Lawrenceville	GA	30045	25-Jun
Mr.	Charles	Westbrook	2565 Winthrope Way	Lawrenceville	GA	30044	22-Jun
Mr.	Thomas	Lanford	3195 Haverhill Rowe	Lewisville	GA	30094	15-Jun
Mr.	David L.	Floyd	4696 Kellogg Dr. SW.	Lilburn	GA	30047	17-Jun
Mr.	Paul	Little	4223 Russet Court SW	Lilburn	GA	30047	16-Jun
Mr.	Charles E.	Glaze	3625 Irvin Drive	Lithonia	GA	30058	8-Jul
Mr.	Randy	Frost	Rt 1 Bx 614 Sprghl Ch. Rd.	Lizbiia	GA	31052	15-Jun
Mrs.	Nina R.	Reeves	P.O. Box 514	Lizella	GA	31052	17-Jun
Mr.	W. L.	Reeves	P.O. Box 514	Lizella	GA	31052	17-Jun
Mr.	Marty B.	Fleming	2470 Broadnax Mill Rd, SW.	Loganville	GA	30052	17-Jun
Mr.	Robert	Duncan	Route 2 Box 89D	Ludowici	GA	31316	16-Jun
Ms.	Marsha	Starr	Route 2 Box 89 D	Ludowici	GA	31316	16-Jun
Mr.	Jeffrey D.	Bridges	11626 Magnolia Court	Macon	GA	31210	15-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	David	Chambers, Jr.	P.O. Box 2622	Macon	GA	31203	15-Jun
Mr.	Carl V.	Dixon	2264 Companion Dr.	Macon	GA	31217	18-Jun
Mr.	William A.	Huskey	136 N. Springs Court	Macon	GA	31210	15-Jun
Mr.	Harold L.	Newberry	PO Box 974	Macon	GA	31202	18-Jun
Mr.	Shaw	Rowland	1134 Will Scarlet Way	Macon	GA	31220	8-Jul
Ms.	Barbara	Ancar	1498 Bentley Lane	Marietta	GA	30067	6-Jul
Mr.	John	Bailey	1488 Bailey Farm Drive, SW	Marietta	GA	30064	16-Jun
Ms.	Sherry	Bailey	1488 Bailey Farm Drive, SW	Marietta	GA	30064	16-Jun
Mr.	Mark R.	Barnes	906 Trailside Lane SW	Marietta	GA	30064	18-Jun
Mr.	Chris	Bock	222 Maple Ave	Marietta	GA	30064	12-Jun
Mr.	Hubert	Brown	654 Elberta Drive	Marietta	GA	30066	16-Jun
Ms	Rebecca	Burnaugh	2085 Roswell Rd. NE. #732	Marietta	GA	30062	15-Jun
	Gene	Estensen	774 Sharpshooters Ridge	Marietta	GA	30064	17-Jun
Mr.	Harvey D.	Gambrell	2816 Beverly Ahills Dr.	Marietta	GA	30068	17-Jun
Ms.	Marilyn	Gilhuly	3750 Waterlilly Way	Marietta	GA	30067	17-Jun
Mr.	Leonard K.	Hail	1943 Bill Murdock Road	Marietta	GA	30062	15-Jun
Mr.	Grady	Ireland	1008 Greymont Circle	Marietta	GA	30064	15-Jun
Mr.	Tom	Larkin	2124 Meadowind Lane	Marietta	GA	30062	8-Jul
Mr.	Austin	Macmullan	3845 Swallow Ct.	Marietta	GA	30066	1-Jul
Mr.	Michael	Novosel	1500 Paxfact Overlook	Marietta	GA	30066	15-Jun
Ms.	Karla J.	Sampson	300B Woodchase Lane	Marietta	GA	30067	25-Jun
Ms.	Meg	whittemore	1675 Roswell Rd., apt 538	Marietta	GA	30062	6-Jul
Mr.	James D.	Williamson, Jr.	1677 Rustic Dr.	Marietta	GA	30008	13-Jul
Mr.	James O.	Wilson, Jr.	4420 Sylvia Drive	Marietta	GA	30064	11-Jun
Mr.	Henry E.	Buhman	1314 E Cobb Dr.	Marietta	GA	30068	15-Jun
Mr.	Gordon A.	Blaker	4689 Red Leaf Way	Martinez	GA	30907	1-Jul
Ms.	Kerry M.	Haney	410 Parkway Drive	Martinez	GA	30907	9-Jun
Mr.	William G.	Dodd	156 Cotton Indian Creek Rd.	McDonough	GA	30252	16-Jun
	Francis Y.	Fife, Jr.	488 Hwy 81 East	McDonough	GA	30252	17-Jun
Mr.	David M.	Bynres	250 Withlacoochee Ave.	Meldrin	GA	31318	22-Jun
Mr.	John E.	Greene	798 Day Rd.	Mensville	GA	30256	22-Jun
Mrs.	Patricia A.	Greene	798 Day Rd.	Mensville	GA	30256	22-Jun
	Robin	Todd	P.O. Box 196	Meridian	GA	31319	16-Jun
Mr.	John	Greenway	Rt. 3 Box 595	Metter	GA	30439	16-Jun
	Clinton	Phillips	7219 Westport Ct.	Midland	GA	31820	16-Jun
Mr.	Wayne	Rountree	P.O. Box 257	Midville	GA	30441	16-Jun
Mr.	Roger S.	Durham	521 Marsh View Dr.	Midway	GA	31320	16-Jun
Mr.	Michael W.	Folker	15 Bridgon Rd.	Midway	GA	31320	30-Jun
Mr.	John C.	Tyon, Jr.	560 Marsh View Dr.	Midway	GA	31320	6-Jul
Mr.	Robert Lamar	Chambers	101 Lakecrest Dr	Milledgeville	GA	31061	26-Jun
	Gabe	Gaddis	312 N. Jefferson St.	Milledgeville	GA	31061	16-Jun
Mr.	Gene	Hammett	165 Log Cabin	Milledgeville	GA	31061	16-Jun
Mrs.	Donna	Telley	122 Swan Court	Monticello	GA	31064	15-Jun
Mr.	Patrick	Telley	122 Swan Court	Monticello	GA	31064	15-Jun
Mr.	Dan	Loftin	18 Bethlehem Ch. Rd.	Moreland	GA	30259	13-Jul
Ms.	Faye	Bridwell	1916 2nd St., SE.	Moultrie	GA	31768	17-Jun
Mr.	Jack	Bridwell	1916 2nd St., SE.	Moultrie	GA	31768	17-Jun
Mr.	Martin	Loyley	3232 Sylvester Drive	Moultrie	GA	31768	8-Jun
Ms.	Cathy	Macomber	1027 Millpond Road	Moultrie	GA	31768	9-Jun
Mr.	Robert	Macomber	1027 Millpond Road	Moultrie	GA	31768	9-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	Mark	Carter	610 E. Dobbins Street	Mt. Vernon	GA	30445	16-Jun
Mr.	William	Liles	Johnson Rd.	Musella	GA	31066	17-Jun
Mr.	Richard C.	Fischer	5291 W. Jones Bridge Road	Norcross	GA	30092	9-Jun
Mr.	Joseph H.	Smoak, Sr.	6265 Applegate Ct., NW	Norcross	GA	30092	18-Jun
Mr.	Mike	Hudson	204 N. Irwin Ave.	Ocilla	GA	31774	23-Jun
Mr.	Charles L.	Hannah	300 Sawmill Trace	Peachtree City	GA	30269	15-Jun
Mr.	J. Edward	Jackson	204 Fieldstone Lane	Peachtree City	GA	30269	22-Jun
Mr.	Jimmy	Cook	P.O. Box 143	Pembroke	GA	31321	16-Jun
Ms.	Judy	Cook	P.O. Box 143	Pembroke	GA	31321	16-Jun
Ms.	Tanya	Kargeter	P.O. Box 1433	Pembroke	GA	31321	16-Jun
Mr.	Percy	Stewart	6272 B Hwy 280 E	Pembroke	GA	31321	25-Jun
Mr.	George	Strickland	757 Harveytown Road	Pembroke	GA	31321	16-Jun
Mr.	Howard	App	215 Cullen St.	Pooler	GA	31322	16-Jun
Mr.	Randall C.	Bodyford	431 Cliff Dr.	Pooler	GA	31322	23-Jun
Ms.	Norma	Carper	320 Georgia Ave	Pooler	GA	31322	15-Jun
Mr.	W. A.	Davis, Jr.	110 Tarver St.	Pooler	GA	31322	17-Jun
	Deane	Dowd	407 Cardinal St.	Pooler	GA	31322	16-Jun
Mr.	Stephen A.	Dowed	407 Cardinal St.	Pooler	GA	31322	16-Jun
Mr.	Ed	Harris	1233 Homer City Way	Pooler	GA	31322	16-Jun
Ms.	Jo Ann C.	VanHook	11070 big bend Rd.	Pooler	GA	31322	17-Jul
Mr.	John L. W.	Blair	3 Warren Dr.	Port Wentworth	GA	31407	2-Jul
	Terry	Blakenship	217 Osteen St.	Port Wentworth	GA	31407	22-Jun
Ms.	Linda	Davis	7 Warren Drive	Port Wentworth	GA	31407	16-Jun
Ms.	Alice J.	Dunejair	317 Binkenhead St.	Port Wentworth	GA	31407	22-Jun
Mr.	James	Dunigan, Jr	317 Binkenhead St.	Port Wentworth	GA	31407	16-Jun
	C. A.	MacFarland Lowell	114 Falkirk St.	Port Wentworth	GA	31407	22-Jun
Ms.	Mary A.	Mixon	639 Meinhardt Road	Port Wentworth	GA	31407	10-Jun
Mr.	Donald B.	Wilson, Jr.	322 Birkenhead St.	Port Wentworth	GA	31407	22-Jun
Mr.	Bill	Bomar	2854 Rising Sun Trail	Powder Springs	GA	30127	15-Jun
Ms.	Blanch	Bachmann	15 Lanvale St.	Pt. Wentworth	GA	31407	25-Jun
Mr.	Hank	Bachmann	15 Lanvale St.	Pt. Wentworth	GA	31407	25-Jun
	R.L.	Kitchings	26 Warren Dr.	Pt. Wentworth	GA	31407	25-Jun
Mr.	Curtis	Gay	601 Stephens Little Rd.	Register	GA	30452	16-Jun
Mr.	Ray	Kennedy	1170 Cypruss Lake Rd.	Register	GA	30452	16-Jun
Ms.	Gail	Powell	P.O. Box 112	Reidsville	GA	30453	6-Jul
Mr.	Larry	Powell	P.O. Box 112	Reidsville	GA	30453	6-Jul
Dr	John	Roush	123 Kennedy Street	Reidsville	GA	30453	16-Jun
	A.L.	Wear	HC01 Box 356	Reidsville	GA	30453	25-Jun
Mr.	John	Wingate	PO Box 146	Reidsville	GA	30453	25-Jun
Mr.	Richard	Menard	3038 Bobolink Drive	Rex	GA	30273	22-Jun
Mr.	Woodson P.	Anderson	137 Charlies Road	Richmond Hill	GA	31324	9-Jun
Ms.	Joan	Bacot	PO Box 351	Richmond Hill	GA	31327	16-Jun
Mr.	James	Carollo	441 Sandpiper Dr.	Richmond Hill	GA		16-Jun
Mr.	Frank	Chance	P.O. Box 403	Richmond Hill	GA		16-Jun
Mr.	Ernest M.	Daniel	197 Robinson Loop	Richmond Hill	GA		19-Jun
Ms.	Nancy	McKenzie	PO Box 1146	Richmond Hill	GA		16-Jun
Mr.	Walter W.	Meeks III	1533 Ft. McAllister Rd	Richmond Hill	GA	31324	30-Jun
Mr.	Steve	Mehl	194 Mackay Drive	Richmond Hill	GA	31324	16-Jun
Ms.	Annette	Mitchell	68 Seweca Lane	Richmond Hill	GA	31324	25-Jun
Mr.	Rick	Phillips	111 Gill Rd	Richmond Hill	GA	31324	16-Jun
Mr.	Ronald	Steinhult	702 Steelework	Richmond Hill	GA	31324	17-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	Dale	Swafford	P.O. Box 123	Richmond Hill	GA	31324	17-Jun
Mr.	Kenneth H.	Van der Ark	P.O. Box 1708	Richmond Hill	GA	31324	19-Jun
Mr.	David R.	Woods	72 Lewis Dr.	Richmond Hill	GA	31324	16-Jun
Mr.	James P.	Brazell, Jr.	103 Highland Dr.	Rincon	GA	31326	2-Jul
Ms.	Vicki	Dunn	200 LK Tomachechee Dr.	Rincon	GA	31326	15-Jun
Ms.	Kimberly	Faircloth	410 Savannah Ave.	Rincon	GA	31326	16-Jun
	A.T.	Fletcher III	251 Chimney Rd.	Rincon	GA	31326	25-Jun
Mr.	Richard	Heck	491 Exlly Loop	Rincon	GA	31326	16-Jun
Mr.	Forrest	Jones	109 Lauren Drive	Rincon	GA	31326	6-Jul
Ms.	Tonja	Kopp	430 Weisenbaker Rd. #25	Rincon	GA	31326	16-Jun
Mr.	James	Kyzs	430 Weisenbaker Rd.	Rincon	GA	31325	16-Jun
Mr.	Gary	Lander	107 John Glenn	Rincon	GA	31326	16-Jun
Mr.	Joseph L.	Larson	105 Lisa St., J8	Rincon	GA	31326	23-Jun
Mr.	Henry S.	Lee, Jr.	PO Box 31	Rincon	GA	31326	25-Jun
Ms.	Lisa	Restiw	120 Towne Park Dr.	Rincon	GA	31326	16-Jun
Mr.	Edward S.	Riner	1105 Street Thomas Drive	Rincon	GA	31326	3-Jun
Mr.	Charles	Roberts	119 St. Thomas Drive	Rincon	GA	31326	16-Jun
Ms	Cindy	Roberts	119 St. Thomas Drive	Rincon	GA	31326	15-Jun
Mr.	Ryan	Sanders	P.O. Box 1106	Rincon	GA	31325	16-Jun
	Lynn	Sapp	105A Lisa St.	Rincon	GA	31326	16-Jun
Mr.	Kenneth	Schaffauer	PO Box 487	Rincon	GA	31326	16-Jun
Mr.	Ronald	Thompson	PO Box 697	Rincon	GA	31326	16-Jun
Ms.	Cindy	Underwood	PO Box 1127	Rincon	GA	31326	16-Jun
Ms.	Beverly W.	Williams	P.O. Box 1468	Rincon	GA	31325	8-Jun
Mr.	Howard A.	Williams	P.O. Box 1468	Rincon	GA	31326	8-Jun
	T.D.	Wilson	504 Mottweiler	Rincon	GA	31326	25-Jun
Ms.	Mary A.	Humphreys	1019 Bandy Rd.	Ringgold	GA	30736	18-Jun
Ms.	Jeannette	McReynolds	7771 Marabow Ln	River Dale	GA	30274	8-Jul
Mr.	Charles L.	Blalock	109 W. 8th Dr.	Rome	GA	30161	15-Jun
Mrs.	Donna G.	Blalock	109 W. 8th Dr.	Rome	GA	30161	15-Jun
	J. T.	Cobb, Jr.	16 Downing St.	Rome	GA	30161	15-Jun
Ms.	Penny	Curry	62 Harris Rd. NE.	Rome	GA	30161	6-Jul
Mr.	James L.	Curry, Jr.	62 Harris Rd., NE.	Rome	GA	30161	6-Jul
	L.	Gartin	600 Redmond Rd.	Rome	GA	30165	6-Jul
Mr.	A.W.	Ledbetter, Jr.	Box 1067	Rome	GA	30161	23-Jun
Mr.	Gerard W.	Bartlett	475 Hembree Hollow	Roswell	GA	30076	18-Jun
COL	Thomas W.	Dalton	25 Oak Street, Suite 1	Roswell	GA	30075	26-Jun
Mr.	Jeffrey L.	Hamilton	1080 Lyndhurst Way	Roswell	GA	30075	15-Jun
Mr.	Kenneth H.	Young	4643 Huntridge Dr.	Roswell	GA	30075	19-Jun
Ms.	Debbie	Buckner	PO Box 27	Rupert	GA	31081	18-Jun
	Jo	Cummings	210 S. Smith St.	Sandersville	GA	31082	22-Jun
	Dawne	Smith	609 Chatham St.	Sardis	GA	30456	8-Jul
	Montie	Acuff	19 E. 46th St.	Savannah	GA	31405	19-Jun
Mr.	Don	Adams	7370 Hodgen Memorial Dr.	Savannah	GA	31406	16-Jun
	Derick B.	Aleason	318 East Gaston St. #2	Savannah	GA	31401	16-Jun
Ms.	Gail W.	Alexander	523 Rose Dhu Road	Savannah	GA	31419	10-Jun
Mr.	Paul T.	All	118 Bobstay Ct.	Savannah	GA	31410	25-Jun
Ms.	Dona E.	Allen	5 Beaver Run Dr.	Savannah	GA	31419	16-Jun
Mr.	Jeff	Allen	632 Suncrest Blvd	Savannah	GA	31410	16-Jun
Ms.	Maureen L.	Alonso	26 Piney Pt. Rd.	Savannah	GA	31410	16-Jun
	R. C.	Alonso, Sr.	26 Piney Pt. Rd.	Savannah	GA	31410	16-Jun

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Mr.	Kenny	Anderson	306 Redan	Savannah	GA	31410	25-Jun
Mr.	Robert	Armsted, Jr.	118 E. 31st St.	Savannah	GA	31401	19-Jun
Ms.	Betty L.	Arnold	509 Howard Street	Savannah	GA	31401	8-Jun
Mr.	Joseph	Austin	323 Bunting Drive	Savannah	GA	31404	8-Jun
Ms.	Siobohn	Austin	323 Bunting Drive	Savannah	GA	31404	22-Jun
Mr.	Austin	Ayala	15 Cornus Dr.	Savannah	GA	31406	16-Jun
Mr.	Thomas	Ayala	15 Cornus Dr.	Savannah	GA	31406	16-Jun
Ms.	Charlene	Baer	1523 Marcy Circle	Savannah	GA	31406	16-Jun
Mr.	Norman	Baer	1523 Marcy Circle	Savannah	GA	31406	16-Jun
Mr.	Mark C.	Baker	162 Rendall Ave	Savannah	GA		16-Jun
Ms.	Laura	Banks	5 Eaton Ln.	Savannah	GA	31419	16-Jun
Mr.	Wolfgang	Banks	1 Modena Island	Savannah	GA	31411	16-Jun
Mr.	Alan	Barnes	2402 Easy St.	Savannah	GA	31406	16-Jun
Mrs.	Monica	Barnes	2402 Easy St.	Savannah	GA	31406	16-Jun
Ms.	Anne E.	Barnett	106 W. Jones Street	Savannah	GA	31401	8-Jun
Mr.	E. S.	Barnett	106 W. Jones Street	Savannah	GA	31401	8-Jun
Mr.	Tim	Baumgartner	129 Blue Heron Dr.	Savannah	GA	31410	18-Jun
Mr.	Paul P.	Baxter	11 Clarendon Road	Savannah	GA	31410	11-Jun
Mrs.	Virginia	Baxter	11 Clarendon Road	Savannah	GA	31410	9-Jun
Ms.	Eileen M.	Beck	116 Hampshire Road	Savannah	GA	31410	8-Jun
Mr.	James	Beck	116 Hampshire Road	Savannah	GA	31410	3-Jun
Mr.	Cliff	Bedell	70 Lighthouse Ct.	Savannah	GA		16-Jun
Mr.	Frank	Bele	116 Pine Grove Drive	Savannah	GA	31419	4-Jun
Mr.	Jim	Bele	116 Pine Grove Drive	Savannah	GA	31419	4-Jun
Ms.	Lucy	Bele	116 Pine Grove Drive	Savannah	GA	31419	4-Jun
Mr.	Tim	Bele	116 Pine Grove Drive	Savannah	GA	31419	22-Jun
Mr.	James	Belk	116 Hampshire Rd.	Savannah	GA	31410	17-Jun
	Ronnie W.	Bell	3321 Louis St.	Savannah	GA	31404	25-Jun
Mr.	Martin	Belles	609 E 57th St.	Savannah	GA		16-Jun
Mr.	Don	Bennett	1558 Argyle Rd.	Savannah	GA	31419	8-Jul
Mr.	Don L.	Bennett	1558 Fort Argyle Road	Savannah	GA	31419	9-Jun
Mrs.	Don L.	Bennett	1558 Fort Argyle Road	Savannah	GA	31419	9-Jun
Mrs.	Glenda	Bennett	1558 Argyle Rd.	Savannah	GA	31419	8-Jul
Mr.	Raf	Biezenbos	7004 Sandnettles Drive	Savannah	GA	31410	9-Jun
Mr.	Howard	Blatner	2805 Aimar Avenue	Savannah	GA		16-Jun
Mr.	Stephen L.	Bohlive Davis	142 Bull Street	Savannah	GA	31401	17-Jun
Ms.	Melissa Rhodes	Bond	509 E. 64th Street	Savannah	GA	31405	17-Jun
Ms.	Rebecca	Borell	437 A Tibet Ave.	Savannah	GA	31406	17-Jun
Mr.	Charles D.	Bragg	701 Eisenhower Dr.	Savannah	GA	31416	15-Jun
Ms.	Betty J.	Breza	208 W. Jones St.	Savannah	GA	31401	19-Jun
Mr.	Robert J.	Breza	208 W. Jones St.	Savannah	GA	31401	17-Jun
Ms.	Evelyn	Bristow	708 Hammocks View	Savannah	GA	31410	18-Jun
	M. E.	Brown	2110 E. 57th St.	Savannah	GA	31404	19-Jun
Mr.	B.	Bryant	6 Cornus Ct.	Savannah	GA	31406	16-Jun
Ms.	Marie G.	Bryant	6 Cornus Ct.	Savannah	GA	31406	16-Jun
Mr.	Christopher	Buchanan	1107 Cobb Rd	Savannah	GA	31410	15-Jun
Ms.	Mary	Burnett	808 Meriwether Dr.	Savannah	GA	31406	22-Jun
	Park	Callahan	212 W. Jones St.	Savannah	GA	31401	16-Jun
	Janis Z.	Campbell	4 1/5 Cornus Dr.	Savannah	GA	31406	2-Jul
	Louis F.	Caputo	156 Hopecrest	Savannah	GA	31406	16-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Ms.	Mary	Caputo	156 Hopecrest	Savannah	GA	31406	17-Jun
Mr.	David W.	Carraway	101 Red Fox Dr.	Savannah	GA	31419	17-Jun
Mr.	Scott	Carter	3 Oakleaf Ct.	Savannah	GA	31410	25-Jun
	Theron	Carter	740 E. 41st St.	Savannah	GA	31401	18-Jun
Ms.	A. Carol	Cason	1105 Wilma Ave	Savannah	GA	31410	2-Jun
Mr.	Kyle	Christoffel	P.O. Box 30985	Savannah	GA	30985	16-Jun
Ms.	Kathrine	Clark	701 Lincoln Street	Savannah	GA	31401	9-Jun
Mrs.	Anita L.	Clay	131 E. 48th St.	Savannah	GA	31405	18-Jun
	Arnie	Cobb	21 Cutler Dr.	Savannah	GA	31419	22-Jun
Mr.	Michael	Colbert	1402 E. Sand St.	Savannah	GA	31404	9-Jul
Mr.	David	Cole	12422 Deerfield Road	Savannah	GA	31419	16-Jun
Mr.	Phillip R.	Coleman	31 Neva Ave.	Savannah	GA	31406	3-Jun
Ms.	Adele	Collins	508 E. 52nd Street	Savannah	GA	31405	16-Jun
Mr.	James	Collins	1300 E. 38th St.	Savannah	GA	31404	22-Jun
Mr.	Stephen	Collins	508 E. 52st Street	Savannah	GA	31405	16-Jun
Mr.	Sean	Conway	21 Berksdale	Savannah	GA	31419	30-Jun
Mr.	Tim	Conway	21 Barksdale	Savannah	GA	31419	22-Jun
Ms.	Cynthia C.	Cook	204 Edgewood Road	Savannah	GA	31404	26-Jun
Mr.	Ellison	Cook	204 Edgewood Road	Savannah	GA	31404	16-Jun
Mr.	Marion C.	Cooper	402 E. 63rd Street	Savannah	GA	31405	2-Jun
Ms.	Katherine	Copeland	18 Baker's Crossing	Savannah	GA	31406	16-Jun
Mr.	William	Copeland	18 Baker's Crossing	Savannah	GA	31406	16-Jun
	W. D.	Coqdell	2 Rivers Edge Dr.	Savannah	GA	31406	16-Jun
Mr.	Steven	Cosini		Savannah	GA		23-Jun
	A. G.	Coward	1125 Halogon Dr.	Savannah	GA		15-Jun
Mr.	James A. D.	Cox	122 E. Taylor St.	Savannah	GA	31401	17-Jul
Ms.	Nina C.	Cox	8700 Harmon Bluff Rd.	Savannah	GA	31406	2-Jul
Mr.	Terry	Cox	8 Flagship Ct.	Savannah	GA	31410	25-Jun
Mr.	Peter M.	Coy	218 E. Taylor St.	Savannah	GA	31401	17-Jun
Mrs.	Denise	Crask	53 Knollwood Circle	Savannah	GA	31419	17-Jun
Mr.	William R.	Crask, Jr.	53 Knollwood Circle	Savannah	GA	31419	16-Jun
Ms.	Carolin	Creaser	12827 Stillwood Drive	Savannah	GA	31419	16-Jun
	Reed	Creaser	12827 Stillwood Drive	Savannah	GA	31419	6-Jun
Ms.	Amber N.	Cubbins	723 E. 50th St.	Savannah	GA	31405	22-Jun
Mr.	Robert	Cupal	21 Houston St.	Savannah	GA	31401	2-Jul
Mr.	Wendell	Daller	5 Beaver Rund Dr.	Savannah	GA	31419	16-Jun
Mr.	Cecil	Daniel, Jr.	126 Hampshire Road	Savannah	GA	31410	9-Jun
Mr.	G. William	Davenport	4 Althea Parkway	Savannah	GA	31405	18-Jun
M	William	Davenport	4 Althea Parkway	Savannah	GA	31405	2-Jul
r.	Matthew						
Mr.	Anthony	Davis	4 Sapelo Rd.	Savannah	GA	31410	22-Jun
Mr.	Richard E.	Davis	213 East Gaston St.	Savannah	GA	31401	18-Jun
Mrs.	Richard E.	Davis	213 East Gaston St.	Savannah	GA	31401	18-Jun
Ms.	Patty	Debany	92 Red Fox Dr.	Savannah	GA	31419	17-Jun
Mr.	Kristopher L.	DeHart	314 Goebel Ave	Savannah	GA	31404	19-Jun
Mr.	John	DeLorme	1314 E. 49th Street	Savannah	GA	31404	2-Jun
Mr.	John	DeLorme	1314 E. 49th Street	Savannah	GA	31404	18-Jun
Ms.	Rita H.	DeLorme	1314 E. 49th Street	Savannah	GA	31404	2-Jun
Ms.	Sarah	Devine	1107 Cobb Road	Savannah	GA	31410	16-Jun
Mr.	James W.	Dewberry	322 E. Taylor St., Apt 617	Savannah	GA	31401	23-Jun
Mr.	Jos J.	Dimock	510 E. 41st St.	Savannah	GA	31401	30-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mrs.	Jos J.	Dimock	510 E. 41st St.	Savannah	GA	31401	30-Jun
Mr.	Bernard B.	Dismukes	508 Rivers End Drive	Savannah	GA	31406	8-Jul
	W. G.	Dorroh	105 Riverview Rd.	Savannah	GA	31410	16-Jun
Ms.	Stacy	Doty	105 E 66th St.	Savannah	GA	31405	16-Jun
Ms.	Amy	Dougherty	5401 Morgan Street	Savannah	GA	31406	16-Jun
	Lynn	Dukes	17 Island Creek Ln	Savannah	GA	31410	16-Jun
Ms.	Melissa	Dukes	17 Island Creek Ln	Savannah	GA	31410	16-Jun
Mr.	F. Reed	Dulany, Jr.	P.O. Box 546	Savannah	GA	31402	19-Jun
Mr.	David	Duquette	10014 White Bluff Rd. #1306	Savannah	GA	31406	19-Jun
	Kris	Edenfield	4 Bristlecone Court	Savannah	GA	31419	16-Jun
Mr.	Steven	Edenfield	4 Bristlecone Court	Savannah	GA	31419	16-Jun
Ms.	Mary Anne	Edinger	1514 Whitfield Park Circle	Savannah	GA	31406	15-Jun
Mr.	Robert	Edinger	1514 Whitfield Park Circle	Savannah	GA	31406	16-Jun
Mr.	Rawland	Edwards	40 Travis Field Rd.	Savannah	GA	31408	16-Jun
Ms.	Dana L.	Elkins	602 Sandhill Rd.	Savannah	GA	31410	22-Jun
Mr.	Steven E.	Elkins	602 Sandhill Rd.	Savannah	GA	31410	16-Jun
Ms.	Patricia	English	4725 Cumberland Drive	Savannah	GA	31405	16-Jun
Ms.	Cynthia	Evans	5 Black Forest Dr.	Savannah	GA	31410	16-Jun
Mr.	Richard	Evans	5 Black Forest Dr.	Savannah	GA	31410	16-Jun
Mr.	William H.	Evans	2233 Mason Dr.	Savannah	GA	31404	18-Jun
Mr.	Snake	Eyes	1909 Georgia Avenue	Savannah	GA	31404	9-Jun
Ms.	Bonnie	Fargason	20 Oxford Ct.	Savannah	GA	31419	17-Jun
Mr.	Ronald B.	Fargason	20 Oxford Ct.	Savannah	GA	31419	16-Jun
Ms.	Phyllis	Farrell	1418 N. Camdon Circle	Savannah	GA	31406	9-Jun
Mr.	George	Faucett	Route 3 Box 487	Savannah	GA	31406	16-Jun
Ms.	Martha B.	Fay	101 Virginia Ave	Savannah	GA	31404	19-Jun
Mr.	Charles C.	Ferris	9305 Whitefield Ave.	Savannah	GA	31406	16-Jun
Mr.	Chuck	Feuger	13609 Rockingham Rd.	Savannah	GA	31419	16-Jun
Dr.	Mark	Finlay	315 E. 56th St.	Savannah	GA	31405	1-Jul
Mr.	Ralph	Flowers	1324 Crossbrook Place	Savannah	GA	31406	16-Jun
Mr.	Nicholas J.	Foley	13 Landward Way	Savannah	GA	31410	3-Jun
Ms.	Suzanne	Fonst	401 N. Cromwell Rd. Apt S-5	Savannah	GA	31410	19-Jun
Mr.	Bobby	Forkner	12422	Savannah	GA	31419	16-Jun
Ms.	Meghan	Foust	401 W. Cromwell Rd.	Savannah	GA	31410	19-Jun
Ms.	Julia S.	Franklin	1507 Stillwood Dr.	Savannah	GA	31419	30-Jun
Mr.	Marc	Friday	17 Riverbluff Rd.	Savannah	GA	31406	23-Jun
Ms.	Brandie	Fuller	P.O. Box 67	Savannah	GA	31402	8-Jun
	E. N.	Galin	108 Johnston St.	Savannah	GA	31405	16-Jun
	M. P.	Galin	108 Johnston St.	Savannah	GA	31405	16-Jun
Mr.	Marion	Gannam	235 E. Gordon Street	Savannah	GA	31401	2-Jun
Mr.	Michael J.	Gannam	130 West Bay Street	Savannah	GA	31401	2-Jun
Mr.	E. M.	Gay, Jr.	118 Melrose Dr.	Savannah	GA	31410	14-Jul
Mr.	Lee Jason	Gibbs	132 Backshell Road	Savannah	GA	31404	11-Jun
Ms.	Eileen	Giroux	201 Quacco Rd.	Savannah	GA		16-Jun
Mr.	Larry	Giroux	201 Quacco Rd	Savannah	GA		16-Jun
	P.H.	Giusti	222 E. Gwinnett St.	Savannah	GA	31401	23-Jun
Mr.	Robert S.	Glenn	31 E. 44th Street	Savannah	GA	31405	8-Jun
Mr.	Robert S.	Glenn, Jr.	125 E. 49th Street	Savannah	GA	31405	8-Jun
Mr.	Charles A.	Glover	5612 Jan St.	Savannah	GA	31406	2-Jul
Ms.	Sandra L.	Godwin	33 East Victory Drive	Savannah	GA	31405	29-May

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Ms.	Pat	Grace	335 Stephenson Avenue	Savannah	GA	31405	16-Jun
Mr.	Rich	Grace	335 Stephenson Avenue	Savannah	GA	31405	16-Jun
Mr.	Adolfo S.	Graniello	15-D Talina Ln.	Savannah	GA	31419	8-Jul
Mr.	Marcus	Graves	2513 Little John Court	Savannah	GA	31406	16-Jun
Ms.	Gina	Griffin	103 Boyd Drive	Savannah	GA	31526	16-Jun
Mr.	Roe	Griffin	103 Boyd Drive	Savannah	GA	31526	16-Jun
Mr.	Daniel	Grissette	302 Pierpont Ave	Savannah	GA	31404	8-Jun
Mr.	Jim	Grissette	7 Shipwatch Rd.	Savannah	GA	31410	2-Jul
Ms.	Judith	Grissette	7 Shipwatch Rd.	Savannah	GA	31410	2-Jul
Mr.	Tim	Grissette	519 Beauregard St.	Savannah	GA	31405	6-Jul
Mr.	James	Gunter	403 Collingwood Dr.	Savannah	GA	31419	16-Jun
Ms.	Lorraine	Gunter	43 Heathcote Cir.	Savannah	GA	31405	24-Jun
Ms.	Varetta	Gunter	403 Collingwood Drive	Savannah	GA	31419	16-Jun
Ms.	Nanci	Hackle	7 Palm Avenue	Savannah	GA	31404	10-Jun
Mr.	Robert E.	Hadaway	12444 North Wood Rd.	Savannah	GA	31419	2-Jul
Ms.	Allison	Haeussler	615 Oemler Loop	Savannah	GA	31410	16-Jun
Mr.	Michael	Haeussler	615 Oemler Loop	Savannah	GA	31410	16-Jun
Mr.	Timothy J.	Haeussler	A-11 Oyster Shell Rd.	Savannah	GA	31410	16-Jun
Ms.	Carolyn	Hall	102 Forest Ridge	Savannah	GA	31419	22-Jun
Mr.	Michael	Halligan	37 Heron's Nest	Savannah	GA	31410	24-Jun
Mr.	William	Hamilton	200 Kinzie Avenue	Savannah	GA	31404	16-Jun
Mr.	Gaylord C.	Hansen	23 West Perry St.	Savannah	GA	31401	16-Jun
Mr.	Douglas	Hanson	2028 Causton Bluff Rd	Savannah	GA	31404	16-Jun
	J. E.	Harden		Savannah	GA		16-Jun
Ms.	Dorothy J.	Harman	230 E. 50th Street	Savannah	GA	31405	2-Jun
Mr.	Douglas E.	Harman	230 E. 50th Street	Savannah	GA	31405	23-Jun
Mr.	Allen	Harrelson	234 Suncrest Blvd	Savannah	GA	31410	16-Jun
Ms.	Judy	Harrelson	234 Suncrest Blvd	Savannah	GA	31410	15-Jun
Ms.	Mae	Harrison	1404 Kings Way	Savannah	GA	31406	16-Jun
Mr.	Walter C.	Hartridge	119 E. Charlton st.	Savannah	GA	31401	18-Jun
Sen.	Diana	Harvey Johnson	P.O. Box 5544	Savannah	GA	31414	22-Jun
Mr.	Theodore	Haviland, Jr.	62 River Bluff Drive	Savannah	GA	31406	16-Jun
Mr.	Norman	Heidt	c/o Johnny Harris Rest.1651 E. Victory Drive	Savannah	GA	31404	3-Jun
Mr.	Norman	Heidt	205 Fiddlers Bend	Savannah	GA	31406	3-Jun
Ms.	Marcella B.	Henderson	403 E. 61st St.	Savannah	GA	31405	6-Jul
Mr.	Harry L.	Henderson, Jr.	403 E. 61st St.	Savannah	GA	31405	6-Jul
Mr.	Charles	Henry	P.O. Box 67	Savannah	GA	31402	8-Jun
Mr.	Kendall	Herring	115 Coffe Villa Rd.	Savannah	GA	31419	16-Jun
Mr.	Michael	Herring	115 Coffe Villa Rd.	Savannah	GA	31419	16-Jun
Ms.	Jo	Hickson	3601 Abercorn Street	Savannah	GA	31405	2-Jun
Mr.	John G.	High, Jr.	1864 Ashley Rd.	Savannah	GA		16-Jun
Mr.	Dan	Hodges	38 Cornus Dr.	Savannah	GA	31406	25-Jun
Mr.	James	Holland, Jr.	Suite 3 7001 Hodgson Memorial Dr.	Savannah	GA	31406	16-Jun
Mr.	A.E.	Holmes	1433 Whitfield Park Circle	Savannah	GA	31406	16-Jun
	Ray	Hord	236 E. 55th St.	Savannah	GA	31405	16-Jun
Ms.	May	Howard Zipperer	632 Columbus Drive	Savannah	GA	31405	18-Jun
Mr.	Arthur W.	Howe	508 Johnston Street	Savannah	GA	31405	2-Jun
Mr.	Robert A.	Howell	10305 Middleground Rd.	Savannah	GA	31419	19-Jun
Mr.	Ken	Huffman	414 Englewood Dr.	Savannah	GA	31406	17-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Ms.	Kay	Hughes	2322 Lorraine Dr.	Savannah	GA	31404	17-Jun
Ms.	Tiffany	Hughes	2405 Nottingham Drive	Savannah	GA	31406	9-Jun
Mr.	Tom	Hunter	8626 Coohler Ave.	Savannah	GA	31406	17-Jun
Ms.	Carolyn	Hurley	10 Forest Ridge Court	Savannah	GA	31419	9-Jun
Ms.	Hatherine	Ileena	406 E. 51st St	Savannah	GA	31405	22-Jun
Mr.	John S.	Ingram	1423 Spaulding Rd.	Savannah	GA	31406	2-Jul
Ms.	Mary	Ingram	1423 Spaulding Rd.	Savannah	GA	31406	2-Jul
Mr.	Mark	Iocovozz	PO Box 24257	Savannah	GA	31403	16-Jun
Mr.	Martin S.	Jackel	221 E. York Street	Savannah	GA	31401	2-Jun
Ms.	Stephanie D.	Jackel	312 Habersham St.	Savannah	GA	31401	22-Jun
Mr.	Samuel	Jackson	1141 W. Gwinnett St.	Savannah	GA	31405	16-Jun
Mr.	Harry E.	Jennings	545 Columbus Dr.	Savannah	GA	31405	30-Jun
Ms.	Earle	Jennings, Jr	112 Country Club Drive	Savannah	GA	31410	16-Jun
Mr.	Manning T.	Jeter, III	67 Shipwatch Road	Savannah	GA	31410	9-Jun
Ms.	Kathy	Jiles	315 E. DeRenne Ave	Savannah	GA		16-Jun
Mr.	Robert M.	Jivir	12409 Largo Dr. apt 162	Savannah	GA	31419	16-Jun
Mr.	Fred D.	Johnson	1 Lechway	Savannah	GA	31419	16-Jun
Mr.	Tom	Johnson	2808 Aiman Ave	Savannah	GA	31406	17-Jun
Mr.	Victor	Johnson	3235 Woodlawn Dr.	Savannah	GA		25-Jun
Mr.	David	Jones	6407 LaRoche Ave	Savannah	GA	31406	15-Jun
Ms.	Janet	Jones	6407 LaRoche Ave	Savannah	GA	31406	15-Jun
Mr.	James E.	Jones, Jr.	210 West 57th Street	Savannah	GA	31405	9-Jun
Mr.	Greg	Kanor	1005 King George Blvd	Savannah	GA		16-Jun
Mr.	Michael	Karpf	31 Washington Ave.	Savannah	GA	31405	19-Jun
Ms.	Nicole	Kassu	101 St. George Blvd	Savannah	GA	31419	16-Jun
Mr.	Paul	Kassu	101 St. George Blvd	Savannah	GA	31419	16-Jun
Mr.	John	Kellam	29 Morningside Dr.	Savannah	GA	31410	17-Jun
Ms.	Margaret Anne	Kelly	8 Fat Friar's Retreat	Savannah	GA	31411	9-Jun
Mr.	V. E.	Kelly	8 Fat Friars Retreat	Savannah	GA	31411	10-Jun
Mr.	Henry J.	Kennedy, Sr.	2017 Speir Street	Savannah	GA	31406	9-Jun
Mr.	Kenan	Kern	110 Radick Drive	Savannah	GA	31406	16-Jun
Mr.	David	Kesler	11 St. Ives Way	Savannah	GA	31419	2-Jun
Ms.	Marsha	Kesler	11 St. Ives Way	Savannah	GA	31419	2-Jun
Mr.	Archie	Kimbreu	322 Woodley Rd.	Savannah	GA	31419	16-Jun
Ms.	Mollie	Kimbreu	322 Woodley Rd	Savannah	GA	31419	16-Jun
Mr.	Campbell	King	703 E. 57th St.	Savannah	GA	31405	26-Jun
Ms.	Mary	King	6808 LaRoche Ave #4	Savannah	GA	31406	15-Jun
Mr.	Jeff	Kirkland	417 E. Jones St.	Savannah	GA	31401	16-Jun
	Talley	Kirkland, Jr.	417 E. Jones St.	Savannah	GA	31401	16-Jun
Mr.	Paul Matthew	Klein	2314 E. 39th St.	Savannah	GA	31404	6-Jul
Mr.	Peter	Knepton	6 Canterbury Court	Savannah	GA	31419	16-Jun
Mr.	Stanley	Konter	217 Oxford Dr.	Savannah	GA	31405	22-Jun
Mr.	Paul	Kosek	120 W. Taylor Street	Savannah	GA	31401	16-Jun
Mr.	David	Koslen	11 St. Ives Way	Savannah	GA	31419	19-Jun
Mr.	Len	Kramer	6 Shetland Ct.	Savannah	GA	31419	22-Jun
Mr.	Richard	Krell	PO Box 42072	Savannah	GA	31409	18-Jun
Mr.	James	Krembs	495 Tattnall Street	Savannah	GA	31401	16-Jun
Mr.	Pete	Krembs	495 Tattnall Street	Savannah	GA	31401	16-Jun
Ms.	Brenda	Lamont	2616 Norwood Ave	Savannah	GA	31406	6-Jul
Ms.	Joan	Lamont	2616 Norwood Ave	Savannah	GA	31406	6-Jul

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Ms.	Louise H.	Lane	102 E. Gaston Street	Savannah	GA	31401	9-Jun
Mr.	Robert	Lane	6 Spanish Moss	Savannah	GA	31419	16-Jun
	Kelly	Lantz	5 Delermotte Ln	Savannah	GA	31411	16-Jun
Mr.	Teddy R.	Larisly	706 E. 51st St.	Savannah	GA	31405	22-Jun
Mr.	H. Rex	Larkin, Jr.	1201 E. 48th Street	Savannah	GA	31404	2-Jun
Ms.	Michelle	Leeck	5910 Beverly Street	Savannah	GA	31405	9-Jun
Mr.	Martin E.	Liebschner, Jr.	55 E. Deerwood Rd. Apt 56	Savannah	GA	31410	15-Jun
Ms.	Elizabeth	Lindsey	413 Parkersburg Road	Savannah	GA	31406	12-Jun
Mr.	John P.	Lingenfelser	624 E. 55th St.	Savannah	GA	31405	25-Jun
Ms.	Leslie D.	Lingenfelser	624 E. 55th St.	Savannah	GA	31405	25-Jun
Mr.	Jack	Linscott	1512 Whitfield Pk Circle	Savannah	GA		15-Jun
Ms.	Renita	Lipscomb	4305 Worth Street	Savannah	GA	31405	16-Jun
	D.	Luves	4423 Lilac Lane	Savannah	GA	31404	16-Jun
Ms.	H. Terry	Lyle	11409 Willis Drive	Savannah	GA	31419	24-Jun
Mr.	C. Jack	Lyon, Jr.	2402 Norwood Ave	Savannah	GA	31406	6-Jul
Mr.	Robert J.	Lytle, Jr.	118 W. Manta Cove	Savannah	GA	31410	30-Jun
Mr.	Frances R.	Maclean	412 E. 45th Street	Savannah	GA	31405	3-Jun
Mr.	Malcolm R.	Maclean	P.O. Box 9848	Savannah	GA	31412	2-Jun
Mr.	James A.	Maddox, Ph.D.	34 East 50th Street	Savannah	GA	31405	16-Jun
Mr.	Joseph P.	Maggioni	408 E. 53rd St.	Savannah	GA	31405	15-Jun
Mr.	Robert D.	Mallard	313 Pickwick Rd.	Savannah	GA	31410	18-Jun
Ms.	Doris S.	Maltox	314 Goebel Ave	Savannah	GA		3-Jun
Mr.	Nick	Mamalakis	131 Summer Winds	Savannah	GA	31410	2-Jun
Mr.	Hal V.	Mangin	208 Christy Road	Savannah	GA	31410	2-Jun
Mrs.	Hal V.	Mangin	208 Christy Road	Savannah	GA	31410	2-Jun
Mr	Ben	Marbeth	116 S. Brompton Lt.	Savannah	GA	31410	16-Jun
Mr.	Karl	Martin	542 E. 60th Street	Savannah	GA	31405	16-Jun
Mr.	Clyde D.	May	1105 Oak Leaf Dr.	Savannah	GA	31410	16-Jun
Ms.	Lucy	May	1105 Oak Leaf Drive	Savannah	GA	31410	16-Jun
Ms.	Jane	Mayo	1331 Brightwood Dr.	Savannah	GA	31406	22-Jun
	R. Lewisa	Mayo	1331 Brightwood Dr.	Savannah	GA	31406	22-Jun
Mr.	William H.	Mayo	1331 Brightwood Dr.	Savannah	GA	31406	22-Jun
Mr.	Robert	McAlister	117 West Gorden St.	Savannah	GA	31401	17-Jun
Ms.	Susan	McClelland	6 Columbus Dr.	Savannah	GA	31405	15-Jun
Ms.	Betty Jeane	McCorkle	8403 Royal Oak Drive	Savannah	GA	31406	30-Jun
Mr.	Robert L	McCorkle	8403 Royal Oak Drive	Savannah	GA	31406	30-Jun
	A. D.	McCoy-Hunter	8626 Coohler Ave.	Savannah	GA	31406	17-Jun
Mr	Edwin	McCuen	107 Quail Run	Savannah	GA	31406	16-Jun
Mr.	Alvin	McGrath, Jr.	5 Mariners Ct.	Savannah	GA	31406	19-Jun
Mr.	John	McLaughlin	101 St. George Blvd #9T	Savannah	GA	31419	11-Jun
Ms.	Michelle	McLauglin	101 St. George Blvd #9T	Savannah	GA	31419	12-Jun
Mr.	E. Victor	Mereski	1132 Meridian Drive	Savannah	GA	31406	2-Jun
Ms.	Jeannette	Mereski	1132 Meridian Drive	Savannah	GA	31406	2-Jun
Mr.	Larry C.	Meyers	7 Marcy court	Savannah	GA	31406	17-Jun
	Lee	Meyers	314 Goebel Ave	Savannah	GA	31404	19-Jun
Mr.	Ed	Middleton	34 S. Cromwell Rd.	Savannah	GA	31410	15-Jun
Mr.	James W.	Miles	1228 Bacon Park Dr.	Savannah	GA		8-Jul
	T.R.	Miley	2421 Norwood Ave.	Savannah	GA	31406	25-Jun
Mr.	David S.	Milton	11 Honeybee Road	Savannah	GA	31419	3-Jun
Ms.	Marybeth	Milton	11 Honeybee Road	Savannah	GA	31419	3-Jun
Ms.	Boukje G.	Mims	2811 1/2B River Dr.	Savannah	GA	31410	15-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	Joseph E.	Mims	2811 1/2B River Drive	Savannah	GA	31404	15-Jun
Ms.	DeAnne	Mitchell	402 E. 45th St.	Savannah	GA	31405	18-Jun
	J. P.	Morgan	12502 Apache Ave #41	Savannah	GA	31419	15-Jun
Mrs.	Mary R.	Morrison	5745 Ogeechee Rd.	Savannah	GA	31405	30-Jun
Mr.	Howard J.	Morrison, Jr.	5745 Ogeechee Rd.	Savannah	GA	31405	30-Jun
Mr.	Mark	Morsley	119 Kings Ct.	Savannah	GA	31406	17-Jun
Mr.	Daniel	Moseley	8618 Crestwell Avenue	Savannah	GA	31400	16-Jun
	D. W.	Muller	2347 E. 41st St.	Savannah	GA	31404	16-Jun
Mr.	Daniel W.	Muller	2347 E. 41st St.	Savannah	GA	31404	16-Jun
Mr.	Joseph	Muller	120 E. 46th Street	Savannah	GA	31405	2-Jun
Mr.	Peter	Muller	3 Rum Runners Alley	Savannah	GA	31411	10-Jun
Ms.	Betty M.	Murphy	8809 Rivers End Dr.	Savannah	GA	31406	24-Jun
Mr.	Kenyan Eugene	Myers	34 Clarendon Road	Savannah	GA	31410	9-Jun
Mr.	John	Nasworthy	120 Brannen	Savannah	GA		16-Jun
Mr.	Alvin	Neely, Jr.	225 E. Hall Street	Savannah	GA	31401	16-Jun
	Lera G.	Nelligan	4516 Springhill Rd.	Savannah	GA		16-Jun
Mr.	Mathew H.	Nelligan	4516 Springhill Rd.	Savannah	GA	31404	16-Jun
Mr.	Joe	Nelson	15 E. Welwood Dr.	Savannah	GA	31419	17-Jun
Ms.	Pamela	Nesbit-Ferris	9305 Whitefield Ave.	Savannah	GA	31406	16-Jun
Ms.	Linda	Newberry	515 E. 60th St.	Savannah	GA	31405	15-Jun
Mr.	E. L.	Newberry, Jr.	1431 King George Blvd	Savannah	GA	31419	16-Jun
Mr.	Dennis Janod	Newton	601 W 54th Street, Apt 49	Savannah	GA	31405	9-Jun
Ms.	Judy W.	Nichols	711 E. 48th Street	Savannah	GA	31405	7-Jul
	H. C.	Norman	23 Rio Rd.	Savannah	GA	31419	17-Jun
Mrs.	H. C.	Norman, Jr.	23 Rio Road	Savannah	GA	31419	19-Jun
Mr.	David	O'Leary	101 Penrose Dr.	Savannah	GA	31410	16-Jun
Mr.	David F.	O'Leary	101 Penrose Dr.	Savannah	GA	31410	19-Jun
Mr.	Bob	Olson	123 McIntosh Dr.	Savannah	GA	31406	23-Jun
Ms.	Dorothy L.	Owens	1702 Bull St.	Savannah	GA	31401	24-Jun
Mr.	William	Ownbey	29 W. 49th Street	Savannah	GA	31405	17-Jun
Mr.	Richard	Page	5617 Garrard Ave.	Savannah	GA	31405	25-Jun
Mr.	Thomas A.	Paramcie	2 Starboard Ct.	Savannah	GA	31419	19-Jun
Mr.	Thomas	Paramore	2 Starboard Ct.	Savannah	GA	31419	15-Jun
Mr.	Richard	Parrish	140 E 58th St.	Savannah	GA	31405	16-Jun
Mr.	Jeff	Patton	7 Lachlan Lane	Savannah	GA	31411	8-Jul
Mr.	John	Patton	7 Lachlan Lane	Savannah	GA	31411	8-Jul
Mr.	Thomas D.	Payne	102 Burbank Blvd	Savannah	GA	31419	22-Jun
Mr.	David	Pendleton	11000 S. Williamsburg Rd.	Savannah	GA	31419	22-Jun
Ms.	Mary Frances	Petrea	709 E. 52nd St.	Savannah	GA	31405	16-Jun
Mr.	Rick	Petrea	709 E. 52nd Street	Savannah	GA	31405	16-Jun
Ms.	Sharon	Phillip	134 Quacco Rd.	Savannah	GA	31419	6-Jul
Mr.	Russell W.	Phillips	1111 Mohanh St. Apt 310	Savannah	GA	31419	16-Jun
Mr.	Richard L.	Phillips, Sr.	237 Holiday Dr.	Savannah	GA		2-Jul
Mr.	Chet	Porter	109 E. 66th St.	Savannah	GA	31405	22-Jun
Mr.	Wayne	Poskitt	7 Mossy Ct.	Savannah	GA	31419	25-Jun
Mr.	Glen	Price	2110 E. Blvd.	Savannah	GA	31410	25-Jun
Mr.	Stephen E.	Price	PO Box 431	Savannah	GA	31402	18-Jun
Mr.	Ralph C.	Price, Jr.	606 Glenbrook Road	Savannah	GA	30419	8-Jun
	J.	Pritchett	3 Magnolia Crossing	Savannah	GA	31411	30-Jun
Mr.	Duane L.	Qunell	1 Sugar Cane Dr.	Savannah	GA	31419	25-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mrs.	William H.	Randolph, III	201 East 53rd Street	Savannah	GA	31405	16-Jun
Mr.	Alex	Raskin	441 Bull St.	Savannah	GA	31401	25-Jun
Mr.	Curtis James	Rauls, Sr.	1303 E. President St.	Savannah	GA	31404	18-Jun
Mr.	Bill	Reed	5008 Ogeechee Road Lot 56	Savannah	GA	31405	16-Jun
Mr.	Jefferson C.	Reed	704 East 48th Street	Savannah	GA	31405	10-Jun
Mrs.	Jefferson C.	Reed	704 East 48th Street	Savannah	GA	31405	10-Jun
	W. R.	Reed	212 Devonshire Rd.	Savannah	GA	31410	17-Jun
	J. R.	Reynolds	320 E. 60th St.	Savannah	GA	31405	18-Jun
Ms.	Laura W.	Rice	5 Silver Leaf Ct.	Savannah	GA	31406	18-Jun
Mr.	Mervyn A.	Rice, Jr.	5 Silver Leaf Ct.	Savannah	GA	31406	16-Jun
Ms.	Linda	Ring	216 Whittington Dr.	Savannah	GA	31419	16-Jun
Mr.	John	Roberson	1 Ft. Jackson Road	Savannah	GA	31404	8-Jun
Mr.	Denis	Robertson	7 West Back Street	Savannah	GA	31419	16-Jun
Ms.	Theresa	Robertson	7 W. Back St.	Savannah	GA	31419	16-Jun
Ms.	Angela	Rodesky	35 Cutler Dr.	Savannah	GA	31419	8-Jul
	Terry	Rodesky	35 Cutler Dr.	Savannah	GA	31419	8-Jul
Mr.	Jimmi A.	Ropeland	4 Shetland Ct.	Savannah	GA	31419	23-Jun
Mr.	Barrie	Ruland	1410 Belleview Drive	Savannah	GA	31406	16-Jun
Mr.	Steve	Rushing	328 E. 60th	Savannah	GA	31405	25-Jun
Mr.	Daniel	Ruthenberg	129 Bordeaux Lane	Savannah	GA	31419	19-Jun
	Meb	Ryan	310 Washington Ave	Savannah	GA	31405	18-Jun
Mr.	Charles L.	Samz	119 Radick Drive	Savannah	GA	31406	18-Jun
Ms.	Michelle	Sancomb	2604 Dogwood Ave #4	Savannah	GA	31404	8-Jul
	Kiedra Dal	Santo	10509 Middle Ground Rd.	Savannah	GA	31419	17-Jun
Ms.	Joan	Schaaf	398 Penrose Drive, W.	Savannah	GA	31410	8-Jun
Mr.	Walter	Schaaf	398 Penrose Drive W.	Savannah	GA	31410	8-Jun
	A. C.	Schwindler	37 Montgomery St.	Savannah	GA	31401	8-Jul
	F. J.	Schwindler	37 Montgomery St.	Savannah	GA	31401	8-Jul
Ms.	Deborah B.	Scott	133 Bull River Bluff Dr.	Savannah	GA	31410	17-Jun
Mr.	Carol	Searle	12350 Mercy Blvd #281	Savannah	GA	31419	16-Jun
	C. M.	Seginack	121 Stonewall Drive	Savannah	GA	31419	16-Jun
Ms.	Claudia	Sezleter	1738 Woodfirm Ct.	Savannah	GA		9-Jul
Ms.	Marbeth J.	Shay	7004 Sandnettles Drive	Savannah	GA	31410	9-Jun
Mr.	Donnie	Shuman	13 Palmetto Bay Dr.	Savannah	GA	31410	25-Jun
Mr.	Eddie	Shuman	7303 Madison Ave	Savannah	GA	31406	3-Jun
Ms.	Gail	Shuman	7303 Madison Ave	Savannah	GA	31406	3-Jun
Ms.	Valerie	Shuman	7303 Madison Ave	Savannah	GA	31406	16-Jun
Mr.	Harry E.	Shuman, Jr.	4902 D. Pineland Dr.	Savannah	GA	31405	22-Jun
Mrs.	Harry E.	Shuman, Jr.	4902 D. Pineland Dr.	Savannah	GA	31405	22-Jun
Mr.	Michael	Sides	4 Black Oak Court	Savannah	GA	31419	16-Jun
Mr.	Robert	Simmons	515 E. 66th Street	Savannah	GA	31405	16-Jun
Mr.	Robert E.	Simmons	35 East Deerwood Rd.	Savannah	GA	31410	16-Jun
Mr.	Alton D.	Simons	103 Lyman Hall Rd.	Savannah	GA	31410	25-Jun
Mr.	Mark	Skolweck	119 Wasaw Rd.	Savannah	GA		16-Jun
Ms.	Bernita	Slotin	1201 Noble Oaks Drive	Savannah	GA	31406	3-Jun
Mr.	Harris	Slotin	P.O. Box 13648	Savannah	GA	31416	3-Jun
Mr.	Charlie	Smith	7 Sherwood Dr.	Savannah	GA	31406	8-Jul
Ms.	Christa	Smith	22 Tara Manor	Savannah	GA	31406	6-Jul
Mr.	Mark	Smith	509 Whitaker St.	Savannah	GA	31401	25-Jun
Ms.	Mary T.	Smith	2028 Beech Street	Savannah	GA	31404	15-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Ms.	MaryAnn	Smith	117 W. Perry Street	Savannah	GA	31401	16-Jun
Mr.	Robert C.	Smith	535 East 53rd St.	Savannah	GA	31405	18-Jun
Mr.	Robert Vincent	Smith	5100 Waters Ave Apt 1702	Savannah	GA	31404	22-Jun
Ms.	Betty	Smith Rahn	538 E. Victory Dr.	Savannah	GA	31405	19-Jun
	R.	Smitmers	20 E Taylor Pl.	Savannah	GA	31401	16-Jun
Mr.	Robert	Spears	319 E. 51st Street	Savannah	GA	31405	16-Jun
Mr.	Thomas M.	Spillane	408 East 52nd St.	Savannah	GA	31405	18-Jun
Ms.	Mary Ellen	Sproghe	40 E. 45th Street	Savannah	GA	31405	24-Jun
Mr.	John R.	Stafford	720 Birchwood Road	Savannah	GA	31419	12-Jun
Ms.	Carol A.	Stanford	34 Helmsmans Court	Savannah	GA	31410	2-Jun
Mr.	Earl	Stanford	136 Walz Circle	Savannah	GA		22-Jun
Mr.	Raymond E.	Stanford	34 Helmsmans Court	Savannah	GA	31410	3-Jun
Mr.	Bob	Staples	2327 Salcedo Ave.	Savannah	GA	31406	16-Jun
Mr.	Greg	Starbuck	P.O. Box 30948	Savannah	GA	31410	2-Jun
Ms.	Octavia N.	Starbuck	723 E. 50th St.	Savannah	GA	31405	22-Jun
Mr.	Erroll L.	Starling, Jr.	20 South Nicholson Circle	Savannah	GA	31419	13-Jul
Mr.	Mike	Stefanick	1314 E. 51st Street	Savannah	GA	31404	16-Jun
	Rynne	Steinfeld	141 Cardinal Rd.	Savannah	GA		16-Jun
Mr.	Jerry	Stenger	405 Tattnall Street	Savannah	GA	31401	3-Jun
Ms.	Leigh	Stenger	405 Tattnall Street	Savannah	GA	31401	9-Jun
Mr.	Nick	Stergius	900 Mill Ct.	Savannah	GA	31419	25-Jun
Mr.	Mark A.	Stevens	1207 Bacon Park Dr.	Savannah	GA	31402	25-Jun
Mr.	James K.	Stewart	1009 Debbie Ave	Savannah	GA	31410	22-Jun
Mr.	Albert H.	Stoddard	101 W. Gordon Street	Savannah	GA	31401	9-Jun
Mr.	S. F. Marshall	Stone	127 E. 46th St.	Savannah	GA	31405	18-Jun
Mr.	Kevin	Stump	2 Callaway Circle	Savannah	GA	31405	25-Jun
Ms.	Martha L.	Summerell	10 Wesley Crossing	Savannah	GA	31411	8-Jun
Mr.	William F.	Summerell	10 Wesley Crossing	Savannah	GA	31411	8-Jun
Mr.	Edwin J.	Swann	215 E. Gaston St.	Savannah	GA	31401	6-Jul
Mr.	Don	Thigpen	205 Donna Road	Savannah	GA	31410	3-Jun
Mrs.	Patty	Thigpen	205 Donna Road	Savannah	GA	31410	3-Jun
Mr.	Joe	Thompson	7601 Skidaway Road	Savannah	GA	31406	16-Jun
Mr.	Slade	Thorpe	102 E. 46st Street	Savannah	GA	31405	16-Jun
Ms.	Lisa	Tillman	103 Lyman Hall Rd.	Savannah	GA	31410	25-Jun
Mr.	Leonard	Trosten	3 Mainsail Crossing	Savannah	GA	31411	16-Jun
Mrs.	Francis	Turner	442 Moon River Ct.	Savannah	GA	31406	23-Jun
Mr.	Travis	Turner	442 Moon River Ct.	Savannah	GA	31406	23-Jun
	Stacey	Valent	2 Johnny Mercer Blvd	Savannah	GA	31410	8-Jul
	J.	Van Giesen	P.O. Box 5623	Savannah	GA	31407	15-Jun
Ms.	Amanda	Wahn	515 Duart Ave	Savannah	GA	31404	16-Jun
Mr.	Jason	Waters	2 Johnny Mercer, Apt 614	Savannah	GA	31410	25-Jun
Mr.	Mitchell	Waters	526 VA Ave	Savannah	GA	31404	16-Jun
Mr.	Herb	Weaver	32 Barrington Circle	Savannah	GA	31419	16-Jun
Mr.	T. C.	Welch, III	1612 Wilmington Island Rd.	Savannah	GA	31410	3-Jun
Mr.	Randy	West	1012 Brittlewood Drive	Savannah	GA	31410	16-Jun
Ms.	Susan	West	1012 Brittlewood Drive	Savannah	GA	31410	16-Jun
Mr.	Melvin	Wheeler	6353 Garrard Avenue	Savannah	GA	31405	16-Jun
Mr.	Michael A.	Wheless	1409 Knigs Way	Savannah	GA	31406	2-Jul
Mr.	Carlton	White	56 Hidden Lake Court	Savannah	GA	31414	16-Jun
Mr.	Don	White	2 Hathaway Lane	Savannah	GA	31411	16-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Ms.	Marian	White	2 Hathaway Drive	Savannah	GA	31411	16-Jun
Mr.	Steve	White	2104 Vicksburg Dr.	Savannah	GA	31404	23-Jun
	W. J.	White	13115 Hermitager Rd.	Savannah	GA	31419	16-Jun
Mr.	Warren	White	#1 Longwater Lane	Savannah	GA		17-Jun
Mr.	Harold E.	Williams	7 Bose Dr.	Savannah	GA	31409	18-Jun
Mr.	Jack W.	Williams	2112 New Mexico St.	Savannah	GA	31404	16-Jun
Ms.	Judy	Williams	9127 Brighton Place	Savannah	GA	31406	22-Jun
Ms.	Betty	Wilson	543 1/2 E. Congress St.	Savannah	GA	31401	25-Jun
Mr.	William H.	Woods, Jr.	3 Sherborne Rd.	Savannah	GA	31419	25-Jun
Mr.	Walter G.	Wright	12 East Jones Street	Savannah	GA	31401	3-Jun
Mr.	Charles J.	Yankauskas	10 Flinn Drive	Savannah	GA	31406	3-Jun
Mr.	David	Young	701 Whitaker Street	Savannah	GA	31401	10-Jun
Mr.	Art	Howe	508 Johnston Street	Savannah	GA	31405	16-Jun
Mr.	Charles H.	Sankey	P.O. Box 307	Sharon	GA	30664	17-Jun
Mr.	Williams S.	Smedlund	101 Barrington Ridge Ct.	Sharpsburg	GA	30277	16-Jun
Mr.	Thomas H.	Porter, Jr.	565 S. Porter Road	Shiloh	GA	31826	15-Jun
Mr.	Kurt	Graham	3448 Valley Vista Rd.	Smyrna	GA	30080	15-Jun
Mr.	Gordon L.	Jones	481 Norton Circle	Smyrna	GA	30082	17-Jun
Ms.	Martha Frances	Huston	513 Maiden Lane	Sparta	GA	31087	22-Jun
Mrs.	Mauriel	Joslyn	837 Jones St.	Sparta	GA	31087	18-Jun
Mr.	Rick	Joslyn	837 Jones St.	Sparta	GA	31087	18-Jun
Mr.	Bill	Leonard	649 Bethany Rd.	Springfield	GA	31329	25-Jun
	Gene	Tucker	980 Shawnee Egypt Rd.	Springfield	GA	31329	17-Jun
Ms	Diana	Usher	PO Box 194	Springfield	GA	31329	16-Jun
Mr.	Kenny	Usher	PO Box 194	Springfield	GA	31329	16-Jun
	D. E.	Bell	106 Courtney Pl.	St. Marys	GA	31558	17-Jun
Ms.	Joyce	Smith	1060 Greenwillow Dr.	St. Marys	GA	31558	8-Jul
Mr.	Robert L.	Smith	1060 Greenwillow Dr.	St. Marys	GA	31558	8-Jul
Mr.	Jeff	Parker	2501 Demere Rd., #8	St. Simons	GA	31522	25-Jun
Ms.	Mary	Parker	2501 Demere Rd., #8	St. Simons	GA	31522	25-Jun
Mr.	J. Roger	Brown	100 McBride St.	St. Simons Island	GA	31322	16-Jun
Ms.	Cindy	Anderson	12161 U.S. 301 S. 100	Statesboro	GA	30458	16-Jun
Ms.	Jane	Burch	827 Parrish Road	Statesboro	GA	30458	16-Jun
Mr.	Jason	Burch	827 Parrish Road	Statesboro	GA	30458	16-Jun
Mr.	Joel	Burch	827 Parrish Road	Statesboro	GA	30458	16-Jun
Ms.	Laura E.	Burch	827 Parrish Road	Statesboro	GA	30458	15-Jun
Ms.	Ellerie	Daniel	66 Grady Johnson Road	Statesboro	GA	30458	16-Jun
Ms.	Frances C.	Deal	1582 Old River Road, N.	Statesboro	GA	30461	8-Jun
Mr.	Richard	Flynn	447 West Bend Road	Statesboro	GA	30458	16-Jun
Mr.	Jared Allen	Fogel	343 Savannah Ave	Statesboro	GA	30458	16-Jun
Mr.	Shane	Haynes	508 Park Ave	Statesboro	GA	30458	16-Jun
Ms.	Barbara	Hendry, Ph.D.	Box 8051, GSU	Statesboro	GA	30460	18-Jun
Mr.	Sean	Holland	12161 Hwy 301 South, Box 100	Statesboro	GA	30458	17-Jun
	R.	Hutchinson	117 Gentilly Drive	Statesboro	GA	30458	16-Jun
Ms.	Diane	Jordan	447 West Bend Rd.	Statesboro	GA	30458	15-Jun
Mr.	Keith	McIntyre	214 S. Edgewood Drive	Statesboro	GA	30458	16-Jun
Ms.	Kathleen	Pitt	100 Nottingham Tr.	Statesboro	GA	30458	8-Jul
	D.	Presley	106 S. Edgewool Drive	Statesboro	GA	30458	8-Jun
Mr.	Robert M.	Reed	45 Robert Reed Rd.	Statesboro	GA	30458	25-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	David	Williams	109 Hunters Way	Statesboro	GA	30461	16-Jun
Mr.	Dustin	Williams	109 Hunters Way	Statesboro	GA	30461	16-Jun
	J. W.	Williams	556 Oakwood Dr.	Statesboro	GA	30458	17-Jun
Ms.	Vickie P.	Williams	109 Hunter's Way	Statesboro	GA	30461	16-Jun
	Marsha L.	Collins	P.O. Box 2183	Statesboro	GA		16-Jun
Mr.	Thomas Scott	Howell	2027 Providence Road	Statham	GA	30666	15-Jun
Mr.	Jimmy	Jackson	444 Oconey Forest Rd.	Stephens	GA	30667	15-Jun
Mr.	Thomas A.	Jackson	1317 Cedar Heights Dr.	Stone Mountain	GA	30083	17-Jun
Mr.	Norwood L.	Williams, Jr.	4915 Diggers Way	Sugar Hill	GA	30518	6-Jul
Mr.	George	Robinson Jr	450 Running Fawn Drive	Suwanee	GA	30024	16-Jun
	Mire	Daly	2855 White Blossom Ln	Suwanee	GA	30024	6-Jul
Mr.	Rabun A.	Lee, Jr.	914 Jenk Hill Rd.	Sylvania	GA	30467	16-Jun
Ms.	Hilda	Williams	424 N. Main Street	Sylvania	GA	30467	16-Jun
Mr.	William E.	Winsletter	107 Avondale Dr.	Sylvania	GA	30467	16-Jun
Mr.	Leonard	Somor	Rt. 2	Talbottom	GA	31827	22-Jun
Mr.	Robert	Freeman	Rt #2	Talbottom	GA	31827	22-Jun
Mr.	Dan	Brown	P.O. Box 1314	Thomaston	GA	30286	8-Jun
Mr.	David H.	Cason	P.O. Box 806	Thomaston	GA	30286	22-Jun
Mr.	J. R.	Grubb	4121 Crest Hwy.	Thomaston	GA	30286	8-Jun
Mr.	James M.	Rowell	660 Burkett Road	Thomaston	GA	30286	18-Jun
Mr.	Daniel	Battle	927 Old August Hwy SE.	Thomson	GA	30824	17-Jun
Ms.	Mary H.	Cameron	2612 Dogwood Ave, Apt F-21	Thunderbold	GA	31404	8-Jul
Mr.	Hal	Gerber	3316 Lovis Street	Thunderbold	GA	31404	15-Jun
Mr.	Richard R.	Nagel	2612 Dogwood Ave Apt F-21	Thunderbolt	GA	31404	13-Jul
Mr.	John	Rhodes	13 Lakewood Drive	Thunderbolt	GA	31410	10-Jun
	Robin	Sykes	2395 Downing Ave lot 12	Thunderbolt	GA	31404	17-Jun
Mr.	Tim	Mitchell	Route 3 Box 3270	Townsend	GA	31331	16-Jun
Mr.	Kenneth	Holcomb	Ms.P.O. Box 96	Tunnel Hill	GA	30753	22-Jun
Mr.	James	Anderson	PO Box 877	Tybee Island	GA	31328	16-Jun
Ms.	Mary	Ashley	P.O. Box 2438	Tybee Island	GA	31328	16-Jun
Mr.	Robert	Ashley	P.O. Box 2438	Tybee Island	GA	31328	16-Jun
Mr.	Art	Berger	1205 5th Ave	Tybee Island	GA	31328	15-Jun
	Kernita	Berger	1205 5th Ave	Tybee Island	GA	31328	15-Jun
Mr.	Aaron L.	Buchsbaum	6 Ninth Street	Tybee Island	GA	31328	11-Jun
Ms.	Esther R.	Buchsbaum	6 Ninth Street	Tybee Island	GA	31328	10-Jun
Mr.	Cullen	Chambers	P.O. Box 366	Tybee Island	GA	31328	9-Jun
Mr.	Cullen	Chambers	P.O. Box 366	Tybee Island	GA	31328	25-Jun
Mr.	Johnny	Herald	Box 835	Tybee Island	GA	31328	22-Jun
Mr.	Richard G.	Magune	1304 6th Ave.	Tybee Island	GA	31328	16-Jun
Mr.	Derek	Smith	PO Box 2011	Tybee Island	GA	31328	16-Jun
Mr.	Scott	Gilbert	215 Strandhill Rd.	Tyrone	GA	30290	17-Jun
	B. J.	Day	129 C. H. Slaton Rd.	Vidalia	GA	30474	16-Jun
Ms.	Nancy C.	Martin	1622 Aimwell Road	Vidalia	GA	30474	12-Jun
Dr.	William J.	Martin III	1622 Aimwell Rd.	Vidalia	GA	30474	22-Jun
Mrs.	William J.	Martin III	1622 Aimwell Rd.	Vidalia	GA	30474	22-Jun
Mr.	Ronald	Wilkes	983 Taylor Springs Rd.	Vidalia	GA	30474	17-Jun
Ms.	Beth	English	Box 384	Vienna	GA	31092	22-Jun
Ms.	Kathryn W.	Vincent	58 Estates Drive	Villa Rica	GA	30180	15-Jun
Mr.	Alton N.	Hart	80 Beaver Run Court	Waco	GA	30182	9-Jun
	Caye	Guidry	719 Ash Ridge Rd.	Waleska	GA	30183	6-Jul

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	Josef	Benavides	213 C Woodcrest Circle	Warner Robins	GA	31098	2-Jun
Ms.	Jennifer	Blanchette	223 Highland Dr.	Warner Robins	GA	31088	18-Jun
Mr.	Rodney C.	Glock	100 Robins West Parkway #212	Warner Robins	GA	31088	17-Jul
Mr.	Thomas P.	Harden	105 Whisper Ct.	Warner Robins	GA	31098	18-Jun
Mr.	Mark A.	Stibitz	317 Tracy Terrace	Warner Robins	GA	31088	15-Jun
Mr.	Jim	Sheely	7866 Georgia Highway 208	Waverly Hall	GA	31831	8-Jul
Ms.	Karon	Sheely	7866 Georgia Highway 208	Waverly Hall	GA	31831	8-Jul
Mr.	Timothy D.	Lively	411 Claxton-Lively Rd.	Waynesboro	GA	30830	15-Jun
Mr.	Charles E.	Stiegmann	12044 Eddystone St.	Whittier	GA	90606	8-Jul
Mr.	James C.	Atkinson	1386 Highway 362 West	Williamson	GA	30292	22-Jun
Mr.	Hendry	Miller	922 010 Thompson Mill Rd.	Winder	GA	30680	8-Jul
	Hendry	Miller	922 Old Thompson Mill Rd.	Winder	GA	30680	8-Jul
Mr.	John Kater	Miller	922 Old Thompson Mill Rd.	Winder	GA	30680	8-Jul
Mr.	Gary	Hetzel	49 Sadler Tr.	Woodbine	GA	31569	10-Jul
	C. Pat	Cates	174 Beaver Pond Dr.	Woodstock	GA	30188	22-Jun
Mr.	Dennis	Rowe	502 Neil Ct.	Woodstock	GA	30188	26-Jun
Mr.	Kevin	Rowe	502 Niel Ct.	Woodstock	GA	30188	26-Jun
Ms.	Peggy	Rowe	502 Neil Ct.	Woodstock	GA	30188	26-Jun
Mr.	Todd	Rowe	502 Neil Ct.	Woodstock	GA	30188	26-Jun
Mr.	Paul	Van Nortwick	337 Mariner Circle	Woodstock	GA	30189	18-Jun
Ms.	Penny A.	Van Nortwick	337 Mariner Circle	Woodstock	GA	30189	18-Jun
Mr.	Al	Yeast	240 Sabrina Ct.	Woodstock	GA	30188	15-Jun
Mr.	Leon	Lovett	110 E. Colleen St.	Wrightsville	GA	31096	17-Jun
	Juleen	Fellows	1141 Hillcrest Dr.	Freeport	IL	61032	6-Jul
Mr.	Steven	Fellows	1141 Hillcrest Dr.	Freeport	IL	61032	6-Jul
Ms.	Teresa	Krebs	4312 Birch Dr.	Gurnee	IL	60031	6-Jul
Mr.	Fred B.	Lentz	4312 Birch Drive	Gurnee	IL	60031	6-Jul
Mr.	Joseph	Roth	1419 West Acres Road	Joliet	IL	60435	11-Jun
Mrs.	Marcy	Roth	1419 West Acres Road	Joliet	IL	60435	11-Jun
Mr.	Phil	Whitman	2818 189th Place	Lansing	IL	60438	16-Jun
Mr.	Thimothy W.	Good	24717 So. Karkakee Rd.	Manhattan	IL	60442	22-Jun
Mr.	Tom	Hahn	11703 Stephanie Lane	Mokena	IL	60448	10-Jun
Ms.	Carol	Hausermann	1264 Montclaire Pl.	Schaumburg	IL	60173	30-Jun
Mr.	George	Hausermann	1264 Montclaire Pl.	Schaumburg	IL	60172	30-Jun
	Jelene	Campbell	2521 Eastgate Ln.	Blington	IN		8-Jul
Ms.	Karen	Zidar	6824 S. 350 E.	Lafayette	IN	47905	19-Jun
Mr.	Walt	Zidar	6824 S. 350 E.	Lafayette	IN	47905	19-Jun
Ms.	Diana	Byers	4998 W. 125 S.	Marion	IN	46953	8-Jul
Mr.	John L.	Byers	4998 W. 1265 So.	Marion	IN	46953	8-Jul
Mr.	Jim	McFadden	8430 W. SR 25	Mentone	IN	46539	16-Jun
Mr.	Earl W.	Mills	3912 Linden	Muncie	IN		8-Jul
Ms.	Judy	Mills	3912 No Linden	Muncie	IN		8-Jul
Mr.	Ernest	Arnold	4366 Hilldale Drive	Newburgh	IN	47630	16-Jun
Ms.	Tonnia	Arnold	4366 Hilldale Drive	Newburgh	IN	47630	16-Jun
Mr.	Roy S.	McRoberts	3990 Beach Creek Ln	Solsberry	IN	47459	9-Jul
Ms.	Dee	Miller	R1 Box 288	Springville	IN	47462	9-Jul
Mr.	Brian	Saylor	134 A Daleview Dr.	Vincennes	IN	47591	6-Jul
Ms.	Rebecca L.	Saylor	134 A Daleview Dr.	Vincennes	IN	47591	6-Jul
Ms.	Pam	Shepard	311 N. Willow	Baxter Springs	KS		26-Jun
Ms.	Beverly	Mavety	810 Neosho	Emporia	KS	66801	26-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Ms.	Diana	McAnallen	12908 W. 102nd St.	Lenexa	KS	66215	19-Jun
Mr.	Larry	McAnallen	12908 W. 102nd St.	Lenexa	KS	66215	19-Jun
Mr.	James	Ridenour	215 Summit Ave Apt #A	Manhattan	KS	66502	7-Jul
Ms.	Anita	Huntley	906 Roach	Salina	KS		8-Jul
Mr.	Jack	Sheahon	906 Roach	Salina	KS		8-Jul
Mr.	Russell	Hautzenrader	P.O. Box 526	Wathena	KS	66090	7-Jul
Mr.	Herman D.	Kinder	1511 Morehead Rd.	Bowling Green	KY	42101	16-Jun
Ms.	Ruthie	Staley	1838 Ft. Henry Dr.	Ft. Wright	KY		8-Jul
Mr.	Bob	Dukes	1331 St. Rt. 181 S.	Greenville	KY	42345	16-Jun
Mr.	Jamie	Dukes	1331 St. Rt. 181 S.	Greenville	KY	42345	16-Jun
Mr.	Matt	Dan	4197 Boxwood Lane	Independence	KY	41051	16-Jun
Mr.	Ken	Hamilton	3255 Roxburg Dr.	Lixington	KY	40503	16-Jun
Mr.	William R.	Neikink	PO Box 814	Somerset	KY	42502	18-Jun
	S. M.	Hutzler	13939 Lee Anne Dr. #3	Baton Rouge	LA	70818	8-Jul
Mr.	Jim S.	Hirteler	P.O. Box 532	Clinton	LA	70722	8-Jul
Mr.	Brian	Vincent	4040 Hillcrest Dr.	Marrero	LA	70072	6-Jul
Ms.	Gwen	Vincent	4040 Hillcrest Dr.	Marrero	LA	70072	6-Jul
Mr.	Paul	Pressler	213 Pine St.	Metaire	LA	70005	26-Jun
Mr.	George	Esker	5125 Antonini Dr.	Metoirie	LA	70006	16-Jun
Mr.	Aaron	Zerinque	7043 Argonne Blvd.	New Orleans	LA	70124	26-Jun
Ms.	M. Darlene	Smith	388 Sandpiper Place	Sunset	LA	70584	26-Jun
Mr.	Norman E.	Smith	388 Sandpiper Place	Sunset	LA	70584	26-Jun
Ms.	Priscilla	Gilchert	Box 30175	Acushnet	MA	2743	15-Jun
Mr.	Tom	Lincoln	27 Gleason Street	Medford	MA	2155	11-Jun
Mr.	David M.	Sullivan	Box 187	Rutland	MA	1543	10-Jun
Mr.	Ross M.	Kimmel	1254 Doubleday Dr.	Arnold	MD	21012	2-Jul
Mr.	Robert	Jones	5609 Edmundson Ave	Balto	MD	21229	15-Jun
Mr.	Kevin P.	Oyarzo, Sr.	P. O. Box 405	Bucklystown	MD	21712	9-Jun
Mr.	David R.	Baynes	5504 Chris Marave	Clintion	MD	20735	6-Jul
Ms.	Luann C.	Harris	10513 William Tell Lane	Columbia	MD	21046	2-Jul
Mr.	Tim	Allen	1429 Becket Road	Eldersburg	MD	21784	9-Jun
Ms.	Carol A.	Hanson	10149 Maplewood Dr.	Ellicott City	MD	21042	2-Jul
Mr.	Wayne	Hanson	10149 Maplewood Dr.	Ellicott city	MD	21042	2-Jul
Ms.	Jill	Johnson	820 C Heather Ridge Dr.	Frederick	MD	21702	2-Jul
Mr.	Tedd	Johnson	820 C Heather Ridge Drive	Frederick	MD	21702	2-Jul
Ms.	Cheryl	Grimaldi	19085 Sawyer Terrace	Germantown	MD	20874	12-Jun
Ms.	Laura Ann	Miller	19015 Highstream Dr.	Germantown	MD	20874	29-Jun
Ms.	Kristi	Packer	14197 Furlong Way	Germantown	MD	20874	15-Jun
Mr.	Rick	Allen	512 Marion Road	Glen Burnie	MD	21061	9-Jun
Mr.	Walter F.	Mathers	No. 13 Beach Road	Glen Burnie	MD	21060	9-Jun
	J. R.	Rockwell	3233 Orient Fischtail	Laurel	MD	21724	2-Jul
Mr.	James	Rockwell	3233 Orient Fischtail	Laurel	MD	20724	16-Jun
Ms.	Durda M.	Starbuck	P.O. Box 450	Mechanicsville	MD	20659	10-Jun
	Quida M.	Starbuck	P.O. Box 450	Mechanicsville	MD	20659	20-Jul
Mr.	Thomas H.	Starbuck	P.O. Box 450	Mechanicsville	MD	20659	10-Jun
Mr.	Jason	Ferrone	300 Franklin St. Apt E 52	Middletown	MD	21769	15-Jun
Ms.	Carol W.	Shaffer	111 Village Way	Mt. Arry	MD	21771	15-Jun
Ms.	Marcie	Evry	14425 Parkvale Road #6	Rockville	MD	20853	9-Jun
Mr.	P. F.	Smith	214 Blandford St.	Rockville	MD	20850	15-Jun
Mrs.	P. F.	Smith	214 Blandford St.	Rockville	MD	20850	15-Jun
Ms.	Debra	Hoffman	1728 Maryland Ave	Shadyside	MD	26764	17-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	John	Hoffman	1728 Maryland Ave	Shadyside	MD	20764	15-Jun
Mr.	James H.	Aubrecht	1017 N. Delmar	Union	MD	63084	26-Jun
Mr.	Alan	Ezersky	810 Ridge Road	Westminster	MD	21157	15-Jun
Mr.	Arthur R.	Blevins	44900 Robson Rd.	Belleville	MI	48111	22-Jun
Mr.	David	Duyst	4940 Stage NW.	Grand Rapids	MI	49544	16-Jun
Ms.	Alice	Ford	2370 Airway NE.	Grand Rapids	MI	49525	26-Jun
Mr.	Lloyd K.	Ford, Sr.	2370 Airway NE.	Grand Rapids	MI	49525	26-Jun
Ms.	Tracy	Whitman	2818 189th Pl	Lansing	MI	60438	16-Jun
Mr.	Richard J.	Simmons	125 E. 7th St.	Monroe	MI	48161	22-Jun
Mr.	Gary	Simmons	137 North Center #1	Northville	MI	48167	23-Jun
Ms.	Sara T.	Gillespie	20 College Road West	Princeton	MI	8540	9-Jun
Mr.	Alan	Hagood	60220 Eyster Rd.	Rochester	MI	48306	2-Jul
Ms.	Karen	Hagood	60220 Eyster Rd.	Rochester	MI	48306	2-Jul
Mr.	Steven D.	Dolmage	2613 Norton Lawn	Rochester Hills	MI	48307	22-Jun
Mr.	William G.	Martin	138 E. Solk Rd.	Troy	MI	48098	22-Jun
Ms.	Kathleen	Balek	11652 Davis St. NW.	Coon Rapids	MN	55433	30-Jun
Mr.	Steve	Balek	11652 Davis St. NW.	Coon Rapids	MN	55433	30-Jun
Mr.	Thomas G.	Shaw	116 W. 49th Street	Minniapolis	MN	55409	11-Jun
Mr.	Bryan	Struss	503 B Richwood	Bluesprings	MO	64015	7-Jul
Ms.	Karen M.	Page	554 Eagle Manor Ln	Chesterfield	MO	63017	2-Jul
Mr.	Josey M.	Page, Jr.	554 Eagle Manor Ln	Chesterfield	MO	63017	2-Jul
Ms.	Dori	Semler	574 NW 500	Clinton	MO	64735	7-Jul
Mr.	Joel	Semler	574 NW 500	Clinton	MO	64735	7-Jul
Ms.	Lindy	Hoyt	300 Willow #20	Garden City	MO	64747	7-Jul
Mr.	Jim	Jones	3613 Grant	Lee's Summit	MO	64064	7-Jul
Mr.	Derek	Tiffany	11820 Parklawn Dr., Ste 140	Rochville	MO	20852	16-Jun
Mr.	Greg	Stuck	1623 Logan Dr.	Webb City	MO	64870	8-Jul
	G. M.	Frantz, MD	P.O. Box 886	Booneville	MS	38829	22-Jun
	J. D.	Merritt	Route 1 Box 105 B	Leakesville	MS	39451	10-Jun
Mr.	Danny	Cartwright	186 Country Club Road	Camden	NC	27921	10-Jun
Mr.	Thomas E.	Harrison	191 South 343	Camden	NC	27929	9-Jun
Mr.	Kevin	King	187 Run Swamp Road	Camden	NC	27921	10-Jun
Mr.	Kevin	Russell	P.O. Box 217	Camden	NC	27921	9-Jun
Mr.	Thomas W.	Wood, Jr.	221 Lambs Road	Camden	NC	27921	10-Jun
Mr.	Henning S.	Bartlett	293 North 343	Camdon	NC	27921	9-Jun
	C. A.	Cantwright	403 North 343	Camdon	NC	27921	9-Jun
Mr.	Juston	Cartwright	186 Country Club Road	Camdon	NC	27921	9-Jun
Mr.	Gerald E.	Jordan	116 Sleepy Hollow Road	Camdon	NC	27921	9-Jun
Mr.	Alvin	Norfleet, Jr.	188 Lam's Road	Camdon	NC	27921	9-Jun
Mr.	Lee	Powell	162 Sawyer Creek Road	Camdon	NC	27921	9-Jun
Mr.	Leroy	Powell	162 Sawyer Creek Road	Camdon	NC	27921	9-Jun
Mr.	Cecil	Richardson, III	187 Lake Road	Camdon	NC	27921	9-Jun
	H.	Yeaner	508 Atlanta Ave.	Carolina Beach	NC	28428	23-Jun
Mr.	Burl	Rivin	6815 Puppy Hill Lane	Charlotte	NC	28220	16-Jun
Ms.	Ellen	Wilcox	7716 Winterset Dr.	Charlotte	NC	28270	16-Jun
Ms.	Clora	Long	P.O. Box 1625	Cherokee	NC	28719	22-Jun
Mr.	Edward D.	Miller	422 Old Willis School Road	Dallas	NC	28034	9-Jun
Mr.	Al	Boone, Jr.	2999 Highway 11 South	Deep Run	NC	28525	10-Jun
Mr.	Bill	Dickens	718 Bridge St.	Eden	NC	27288	16-Jun
Ms.	Janet	Royal	1502 Worthington Pl.	Greensboro	NC	27410	8-Jul

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	Ralph	Royal	1502 Worthington Pl.	Greensboro	NC	27410	8-Jul
Mr.	Ken	Bucher	P.O. Box 222	Hamilton	NC	27840	15-Jun
Mr.	Alton	McClellan	147 Moore's Landing Rd.	Hampstead	NC	28443	17-Jun
Mr.	Joseph	Davis	148 S. Mills River Road	Horse Shoe	NC	28742	10-Jun
Mr.	Paul E.	Davis	148 S. Mills River Road	Horse Shoe	NC	28742	10-Jun
	Benji	Edwards	4135 Strider Cir	Kannapolis	NC	28081	8-Jul
Mrs.	Betty	Boone	1735 Hill Farm Road	Kinston	NC	28504	10-Jun
Mr.	David	Stocks	318 Fourth Street	Kinston	NC	28504	10-Jun
Mrs.	Tonya	Stocks	318 Fourth Street	Kinston	NC	28504	10-Jun
Mr.	Jason	Moir	247 Colonial Village Dr.	Lincolnton	NC	28092	15-Jun
Mr.	Sanford	Hardin	5414 Union Chapels Rd.	Lumberton	NC	28360	25-Jun
Ms.	Susan	Hardin	5414 Union Chapels Rd.	Lumberton	NC	28358	22-Jun
Mr.	Sidney M.	Jackson	353-B South Academy St.	Mooresville	NC	28115	8-Jun
Mr.	Raeford	Fields	3406 Old Climax Road	Pleasant Gardon	NC	27313	11-Jun
Mr.	Harry	Thompson	P.O. Box 296	Plymouth	NC	27962	9-Jul
Mr.	Todd J.	Wahler	5013 Lakemont Dr.	Raleigh	NC		6-Jul
Mr.	Mark	Wolinsky	3201 Byers Drive	Raleigh	NC	27607	9-Jun
Mr.	Ashley	Joyner	160 Foxfire Pl	S. Pines	NC	28387	16-Jun
Ms.	Cathy	Joyner	160 Foxfire Pl	S. Pines	NC	28387	16-Jun
Ms.	Jennifer L.	Parker	Route 1, Box 103	Sanbury	NC	27979	9-Jun
Mr.	Henry F.	Daidone	P.O. Box 56	Shiloh	NC	27974	9-Jun
Mr.	Ken	Ferguson	1024 North 343	South Mills	NC	27976	9-Jun
Mrs.	Melanie	Brantley Tart	309 West Main Street	Spring Hope	NC	27882	12-Jun
Mr.	Ben	Tart	309 W. Main St.	Spring Hope	NC	27882	22-Jun
Mr.	Robert A.	Parker	Rural Route 1 Box 103	Sunbury	NC	27979	9-Jun
Mr.	John R.	Thomas	P.O. Box 3586	Topsail Beach	NC	28445	16-Jun
	Francis V.	Storer	P.O. Box 393	Trenton	NE	2885	12-Jun
Mr.	Greg F.	Heppe	170 Brown's Ridge Road	Ossipee	NH	3864	9-Jun
Mr.	Dan	Sontos	317 Georgetown Rd.	Columbus	NJ	8022	8-Jul
Ms.	Mary C.	Sontos	317 Georgetown Rd.	Columbus	NJ	8022	8-Jul
Mr.	Walter	Stockel, Jr.	2118 Oak Tree Road	Edison	NJ	8820	9-Jun
Mr.	Bruce	Berent	3 Susan Dr.	Marlboro	NJ	7746	8-Jul
Ms.	Tracy	Boozan	27 Dogwood Rd.	Summit	NJ	7901	23-Jun
Mr.	Steven	Keller	28 Evergreen Rd.	Summit	NJ	7901	25-Jun
Mr.	Robert A.	Jackson	1490 Dogwood Dr.	Sparks	NV	89431	15-Jun
	Louis	Boselli	19 Payson Rd.	Cornwall-Hudson	NY	12520	19-Jun
Ms.	Carol A.	Migliore	145 Madisen Ave.	Lockawanna	NY	14218	2-Jul
Mr.	H. A.	Davies, II	237 E. 54th Street	New York	NY	10022	9-Jun
Mr.	David	Kincaid	3147 Broadway Apt 19	New York	NY	10027	11-Jun
Ms.	Cindy	Peterson	2 South End Ave #8W	New York	NY	10280	15-Jun
Ms.	Rene M.	Schaub	160 East 27th Street #11-B	New York	NY	10016	11-Jun
Mr.	Ines	Woetzel	3147 Broadway #19	New York	NY	10027	11-Jun
Ms.	Marcela	Schaub	160 East 27th Street #11-B	Norfork	NY	10016	9-Jun
Mrs.	Lamoine	Ziankoski	6912 Wright Settlement Rd	Rome	NY	13440	11-Jun
Mr.	William C.	Ziankoski	6912 Wright Settlement Rd.	Rome	NY	13440	11-Jun
Mr.	Don	Siegel	50 Main St.	Warwick	NY	10990	16-Jun
Mr.	Jack	Migliore	4355 Bolivar Rd.	Wellsville	NY	14895	2-Jul
Mr.	Michael	Bergman	522 Norton Rd.	Columbus	OH	43228	18-Jun
Ms.	Sandy	Liebschner	94 W. Lane Ave. #D	Columbus	OH	43201	18-Jun
Ms.	Susan	Liebschner	94 W. Lane Ave. #D	Columbus	OH	43201	18-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	Todd	Rittenhouse	P.O. Box 1411	Delaware	OH	43015	16-Jun
Ms.	Susan	Yoder	3361 Martinsburg Rd.	Gambier	OH	43022	26-Jun
Mr.	Bill	Busam	409 N. Beverly Dr.	Sanusky	OH	44870	6-Jul
Ms.	Mary	Busam	409 N. Beverly Dr.	Sanusky	OH	44870	6-Jul
Mr.	Bill	McGrath	3667 Traver Rd.	Shaller Heights	OH	44122	16-Jun
Ms.	Joyce	McGrath	3667 Traver Rd.	Shaller Heights	OH	44122	16-Jun
Mr.	Eric	Kasprisin	395 Meadcrest Ct.	Westerville	OH	43082	18-Jun
Mr.	Charles	Lamb	149 Crowles Ave.	Westerville	OH	43081	18-Jun
Ms.	Cathy	Ritzman	172 Millfield Ave.	Westerville	OH	43081	18-Jun
Mr.	Sean	Ritzman	172 Millfield Ave.	Westerville	OH	43081	18-Jun
Mr.	Kevin	Ruddy	140 Orchard Ln.	Westerville	OH	43081	18-Jun
Mr.	Alex	Schultz	25 Massey Dr.	Westerville	OH	43081	18-Jun
Mr.	Phillip	Schultz	25 Massey Dr.	Westerville	OH	43081	18-Jun
Ms.	Susan	Schultz	25 Massey Dr.	Westerville	OH	43081	18-Jun
Mr.	Joel	Vince	4892 Westchester Dr. #6	Youngstown	OH	44515	8-Jul
Mrs.	Francis	Irim	154 SW. 69th St.	Lauton	OK	72505	19-Jun
Mr.	Matt	Browne	3605 S. Atlanta Pl.	Tulsa	OK	74105	24-Jun
Mr.	Morgan	Browne	3605 S. Atlanta Pl.	Tulsa	OK	74105	24-Jun
Ms.	Margaret A.	Croly	5494 Coleman Creek Road	Medford	OR	97501	9-Jun
Mr.	Richard L.	Croly	5494 Coleman Creek Road	Medford	OR	97501	9-Jun
Mr.	Bill	Palmer	359 Rockfield Rd.	Pittsburg	PA	15243	16-Jun
Mr.	Daniel	Sheridan	233 Lenoir Ave	Wayne	PA	19087	24-Jun
Mr.	John D.	Snook	1042 Squires Place	West Chester	PA	19382	9-Jun
Ms.	June	Evans	7160 Roundtop Lane	Wrightsville	PA	17368	9-Jun
Mr.	Warren H.	Evans	7160 Roundtop Lane	Wrightsville	PA	17368	9-Jun
Mr.	Ed	Mann	108 Red Oak Ln.	Aiken	SC	29803	16-Jun
Mr.	Jeff	Mosser	22 Roslyn Creek	Aiken	SC	29803	16-Jun
Mr.	George	Lander	537 West Church St.	Batesboro	SC	29006	16-Jun
Mr.	Riley	Bennett	30 Reeds Rd.	Beaufort	SC		15-Jun
Mr.	Bert	Bunton	121 Windsor Road	Beaufort	SC	29906	16-Jun
	H. L.	Gregg	30 Reeds Rd	Beaufort	SC		15-Jun
Ms.	Cathy	Kirkland	145 Meridian	Beaufort	SC	29902	16-Jun
Mr.	Robert	N.	13 Walther Road	Beaufort	SC	29902	15-Jun
Mr.	Tony	Sabatino	31 Briarwood Lane	Beaufort	SC	29906	15-Jun
Mr.	Larry	Sanders, Jr.	15 Burlington Cirlce	Beaufort	SC	29906	16-Jun
Mr.	Riley	Venning	2705 Palm Drive	Beaufort	SC	29902	16-Jun
Mr.	Stephen R.	Wise	712 Duke St.	Beaufort	SC	29902	18-Jun
Mr.	Mike	Hilliard	102 Lewis Way	Beech Island	SC	29841	16-Jun
Mr.	Steve	Bilinsky	P.O. Box 98	Bluffton	SC	29910	16-Jun
	Terry A.	Bilinsky	P.O. Box 98	Bluffton	SC	29910	16-Jun
Mr.	Adam	Floyd	PO Box 262	Bluffton	SC	29910	16-Jun
Ms.	Meredith	Fuge	45 Sawmill Creek Road	Bluffton	SC	29910	15-Jun
Mr.	Jim	Gallagher	6 Grande Oaks Dr.	Bluffton	SC	29910	18-Jun
Mr.	William	Hubbard	18 Cape Jasmine Street	Bluffton	SC	29910	16-Jun
Mr.	Percy	Montague III	481 Sugar Mill Dr.	Bluffton	SC	29910	6-Jul
Mr.	Al	Stokes	81 Carrell Dr.	Bluffton	SC	29910	16-Jun
Ms.	Valerie S.	Taylor	P.O. Box 855	Bluffton	SC	29910	16-Jun
Ms.	Julie	Ward	P.O. Box 905	Bluffton	SC	29910	16-Jun
	Turley	Ward	P.O. Box 905	Bluffton	SC	29910	16-Jun
	P. I.	Bostick, Jr.	P.O. Box 1012	Camden	SC	29020	16-Jun
Mr.	Andrew H.	Lipps	P.O. Box 165	Camden	SC	29020	17-Jun

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	Roger	Dorflinger	1031 Indigo Ave.	Candice	SC	29033	16-Jun
Ms.	Jo Ann	Redmond	1517 Jessamine St.	Candice	SC	29033	16-Jun
Mr.	Bill	Chandler	4921 Ashby Ave	Charleston	SC	29405	2-Jun
Ms.	Lyann J.	Chandler	4921 Ashby Ave	Charleston	SC	29405	2-Jun
Mr	Rhett C.	Dunnaway	P.O. Box 753	Charleston	SC	29402	16-Jun
Mr.	Gary	Faher	1630 B Yongue Ave CAFB	Charleston	SC	29404	29-Jun
Ms.	Nicole	Foher	1630 B. Yongue Ave CAFB	Charleston	SC	29404	30-Jun
Mr.	Shan	Gilbert	2206 Great Hall Ct.	Charleston	SC	29414	23-Jun
	S.	Harris	946 Valley Forge Rd.	Charleston	SC	29412	16-Jun
Ms.	Kathleen	Hunt	1426 Ft. Johnson Rd.	Charleston	SC	29412	16-Jun
Mr.	W. L.	Hunt	1426 Ft. Johnson Rd	Charleston	SC	29412	16-Jun
Mr.	Philip M.	Ramsey	1754 Mohawk Ave	Charleston	SC	29412	16-Jun
Mr.	E. F.	Wambold	26 Queen Street	Charleston	SC	29401	16-Jun
Ms.	Joyce	Wambold	26 Queen Street	Charleston	SC	29401	16-Jun
	W. T.	Waters	681 Old Plantation Rd.	Charleston	SC	29412	17-Jun
Mr.	Ted	Crump	386 Patriots Way	Clover	SC	29710	25-Jun
Mr.	Barton W.	Fordham, III	6671 Frances Street	Columbia	SC	29209	8-Jun
Mr.	R.B.	Masterson, Jr.	602 Lockner Road	Columbia	SC	29212	16-Jun
Ms.	Carla	Stegall	1200 Butler St.	Columbia	SC		16-Jun
	Kim R.	Stezull	1200 Butler St.	Columbia	SC	29205	16-Jun
Mr.	Mike	Wadsworth	126 Silvermill Road	Columbia	SC	29210	15-Jun
Mrs.	A. L.	Burn	7 Prospect Rd.	Daufuskie Island	SC	29915	19-Jun
Mr.	Johnny	Bailey	431 Belle Landler Road	Gilbert	SC	29054	16-Jun
	D. M.	Kamlher	828 Shore Road	Gilbert	SC	29054	15-Jun
Mr.	Timothy	Dasher	Rt. 1 Box 121E	Hardeeville	SC	29927	16-Jun
Ms.	Rosemary	Cox-Smith	1 Royal Terrace	Hilton Head	SC		16-Jun
Mr.	J. Rodger	Horsey	66 Deerfield Rd.	Hilton Head	SC		16-Jun
Ms.	Ellen	Judge	2 Suttlers Run	Hilton Head	SC	29928	25-Jun
Mr.	Tim	Judge	2 Suttlers Run	Hilton Head	SC	29928	25-Jun
Mr.	John	Lewis	16 Shipwatch Point	Hilton Head	SC		16-Jun
		Nickey	77 Quartermaster Ln	Hilton Head	SC	29928	16-Jun
Mr.	Luther	Smith	1 Royal Tern	Hilton Head	SC		16-Jun
Mr.	Charles	Jordan	40 Edgewood Dr.	Hilton Head	SC	29926	15-Jun
Mrs.	Virginia	Jordan	40 Edgewood Dr.	Hilton Head	SC	29926	15-Jun
Mr.	Michael	Bess	19 Delander Ct.	Hilton Head Island	SC	29928	8-Jul
Ms.	Joanna	Ludwig	99 Forest Gardens	Hilton Head Island	SC	29928	17-Jun
	Inas	Otter	34 Sweet Bay	Hilton Head Island	SC	29926	15-Jun
Mr.	Larry E.	Russell	310 B Mariners Point	Hilton Head Island	SC	29926	16-Jun
Mr.	Philip	Bradley	668 River Road	Johns Island	SC	29455	9-Jun
Mr.	Leo W.	Hanna	2585 Vox Hwy	Johnsonville	SC		6-Jul
Ms.	Eleanor	Montagne	48 Sugar Mill Dr.	Katie	SC	29910	6-Jul
Mr.	Larry G.	Shealy	103 Dale Ave	Ladson	SC	29456	25-Jun
	Tony E.	Summey	P.O. Box 2251	Lancaster	SC	29721	16-Jun
Mr.	Sam	Padgett, III	216 S. Wrenwood Dr.	Lexington	SC	29073	15-Jun
Mr.	Walter	Smith	124 Cornish Way	Lexington	SC	29073	15-Jun
Mr.	Wayne	Cross	3310 Mountainbrook Ave.	N. Charleston	SC	29420	16-Jun
Mr.	Paul	Arend	4890 Durant Ave	North	SC	29405	8-Jul

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	William	Hawkins	P.O. Box 5407	Charleston Parris Island	SC	29905	16-Jun
Mr.	Ronnie	Walker	PO Box 510	Pelion	SC	29123	25-Jun
Ms.	Sandy	Walker	PO Box 510	Pelion	SC	29123	25-Jun
Ms.	Sherylyn W.	Porst	PO Box 143	Port Royal	SC	29935	25-Jun
Mr.	Ray	McMillan	146 Rustic Ln.	Ruffin	SC	29475	8-Jul
Mr.	Richard	Gaudry	19 Dirt Road	Seabrook	SC	29940	16-Jun
	Delous	McMahon	19 Duit Rd.	Seabrook	SC	29940	16-Jun
Mr.	Mike	Pope	89 Ball Park Rd.	St. Helena	SC	29920	16-Jun
Ms.	Chrissy	Anderson	712 Simmons Ave.	Summerville	SC	29483	17-Jun
Mr.	James E.	Anderson	712 Simmons Ave.	Summerville	SC	29483	15-Jun
Mr.	David	Dement	136 Charpia St.	Summerville	SC		16-Jun
Mr.	John	DuBose	107 Whitehall Road	Summerville	SC	29485	16-Jun
Mr.	Mark	Lantz	2880 Joyce St.	Sumter	SC	29154	16-Jun
Ms.	Judy	Klipowicz	16087 Heron Run Dr.	Tega Cay	SC	29715	2-Jul
Mr.	Steve	Klipowicz	16087 Heron Run Dr.	Tega Cay	SC	29715	2-Jul
	Francis A.	Lord, Ph.D.	1521 Redwood Drive	W. Columbia	SC	29169	15-Jun
	M. T.	Blalock	2354 Brigger Hill Rd.	Wadmalaw Island	SC	29487	18-Jun
Mr.	Donald B.	Gordon	P.O. Box 372	Walterboro	SC	29488	15-Jun
Ms.	Lilia	Gordon	PO Box 372	Walterboro	SC	29488	16-Jun
Mr.	Jeff	Grant	5419 Mount Carmel Rd.	Walterboro	SC	29488	8-Jul
Mr.	Robert W.	Gates	Route 2 Box 5-B	Winnsboro	SC	29180	9-Jun
Dr.	Jack A.	Meyer	Aeolia 1029 Greenbrier/Mossydale Rd.	Winnsboro	SC	29180	22-Jun
Ms.	Betty	Roe	3460 Timberhill Dr.	Cleveland	TN	37323	8-Jul
	Ronnie W.	Roe	3460 Timberhill Dr.	Cleveland	TN	37323	8-Jul
Ms.	Sue	Roe	3504 Woodridge Dr. SE.	Cleveland	TN	37323	8-Jul
Mr.	Ira Paul	Kelley	P.O. Box 399	Coalfield	TN	37719	30-Jun
Mr.	James N.	Draper	344 N. Dixie Ave.	Cookeville	TN	38501	16-Jun
Ms.	Vicky	Draper	344 N. Dixie Ave	Cookeville	TN	38501	17-Jun
Ms.	Debbie M.	Shaver	716 Shaver Loop Rd.	Dayton	TN	37321	8-Jul
Mr.	Marvin R.	Shaver	716 Shaver Loop Rd.	Dayton	TN	37321	8-Jul
Ms.	Connie L.	Nelson	512 Pine Hill Road	Elizabethton	TN	37618	9-Jun
Mr.	Mark	Strong	475 Slate Creek Rd.	Greeneville	TN	37743	8-Jul
Ms.	Terri Lynne	Strong	475 Slate Creek Rd.	Greeneville	TN	37743	8-Jul
Ms.	Brenda	Jackson	1115 Raintree Road	Knoxville	TN	37923	8-Jun
Mr.	Richard	Jackson	1115 Rain Tree Rd.	Knoxville	TN	37923	25-Jun
Mr.	Richard L.	Jackson, Sr.	1115 Raintree Road	Knoxville	TN	37923	8-Jun
Ms.	Charlene	Click	2137 Highview Drive	Morristown	TN	37813	16-Jun
Mr.	Gary L.	Click	2137 Highview Drive	Morristown	TN	37813	17-Jun
Mr.	James M.	Long	3180 Rocky Springs Road	Piney Flats	TN	37686	9-Jun
Ms.	Lori	Eledge	1327 Clifton Rd.	Savannah	TN	38372	16-Jun
Ms.	Kristi Kosper	Kosper	11302 A Nicole Cv	Austin	TX	78753	1-Jul
Ms.	Jessica	Jackson	7477 Hidden Acres	Cleveland	TX	77327	6-Jul
Ms.	Jennifer	Tucker	4868 Forest Dr.	Cleveland	TX	77327	6-Jul
Ms.	Joan	Tucker	4868 Forest Drive	Cleveland	TX	77327	2-Jul
Mr.	Russell V.	Tucker	4868 Forest Drive	Cleveland	TX	77327	11-Jun
Mr.	Howard	Schuster	403 Longmire Rd.	Conroe	TX	77301	6-Jul
Mr.	Jim	Williams	5807 Elderwood	Dallas	TX	75230	22-Jun
Ms.	Alison	Windham	809 Oak Creek	Ennis	TX	75119	1-Jul
Mr.	Brian	Windham	809 Oak Creek Ct.	Ennis	TX	75119	6-Jul

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	Joe W.	Kolb	1311 Piney Woods Dr.	Friendswood	TX	77546	2-Jul
Mr.	Jim	Powell	1415 W. Buckingham	Garland	TX	75042	18-Jun
Mr.	David W.	Johnson	9727 W. Airport Blvd.	Houston	TX	77031	18-Jun
Mr.	Garrett E.	Johnson	9727 W. Airport Blvd.	Houston	TX	77031	18-Jun
Ms.	Rebecca	Johnson	9727 W. Airport	Houston	TX	77031	18-Jun
Mr.	Jim	Mandie	12122 Wentmere Dr.	Houston	TX	77077	16-Jun
Ms.	Imogene	Ratliff	1508 Zapp Ln.	Pasadena	TX	77502	18-Jun
Ms.	Susan	Davis	240 E. 500 N	Heber	UT	84032	18-Jun
	M. Glade	Edwards	1623 W. 4450 S.	Roy	UT	84067	2-Jul
Mr.	John	Lantz	1149 E. Store Valty Way	Sanas	UT	84094	16-Jun
Mr.	Tim	Smith	1024 N. Utah St., Apt 422	Arlington	VA	22203	25-Jun
Ms.	Jean	Ferguson	P.O. Box 256	Barhamsville	VA	23011	2-Jul
Mr.	Chris	Shields	P.O. Box 770	Berryville	VA	22611	20-Jul
Mr.	Rudolph	Jones	2678 Five Mile Mtn. Rd.	Callaway	VA	24067	26-Jun
Mr.	Gene	Johnson	PO Box 323	Catlett	VA	20119	16-Jun
Mr,	Brian	Fair	225 Crosswinds Drive	Chesapeake	VA	23320	9-Jun
Mr.	Ray	Cassell	3859 Fairfax Sq.	Fairfax	VA	22031	2-Jul
Ms.	Susan G.	Mullen/VCU	Chamberlin Hotel2 Fenwick Rd.	Fort Monroe	VA	23651	17-Jun
Mr.	Daniel	Elkins	16 Old Plantation Drive	Fredericksburg	VA	22407	16-Jun
COL	Herbert M.	Hart (USMC Ret.)	P.O. Box 1151	Ft. Myer	VA	22211	19-Jun
Ms.	Susan	Warr	10539 Glenmer Ct.	Glen Allen	VA	23060	2-Jul
Ms.	Sharon	Smith	154 Saunders Rd.	Hampton	VA	23666	2-Jul
Mr.	Chris	Groves	26 N. Kalmia Ave.	Highland Springs	VA	23075	9-Jul
Mr.	Thomas E.	Marshall	712 Auburn Place	Martinsville	VA	24112	17-Jun
	Terri L.	Davis-Morookian	14009 Sagebrook Dr.	Midlothian	VA	23112	19-Jun
	Virgie E.	Prowell	173 Sun Haven Ct. Apt C	Newport News	VA	23608	2-Jul
	C. A.	Barry	292 Paulette Dr.	Newport News	VA	23608	2-Jul
Mr.	Curtis	Eley	147 Lembla St.	Norfolk	VA	23503	22-Jun
Ms.	Margaret H.	Elinsky	714 Mary Avenue	Norfolk	VA	23170	11-Jun
Mr.	Frank	James	3625 Amherst St.	Norfolk	VA	23513	2-Jul
Mr.	Edward A.	Wright	313 Dune St.	Norfolk	VA	23503	2-Jul
Mr.	Peter	Zink	400 Burleigh Ave.	Norfolk	VA	23505	6-Jul
Mr.	Steve	Sylvia	PO Box 729	Orange	VA	22960	16-Jun
Mr.	Keith	Southall	28319 Fendale Rd.	Petersburg	VA	23803	2-Jul
BG	M. H.	Morris (Ret)	1503 Hodges Ferry Road	Portsmouth	VA	23701	16-Jun
Mr.	Scott	Carson	26 North Sheppard St.	Richmond	VA	23221	19-Jun
Mr.	Robert	Hicks	809 E. Broad Street	Richmond	VA	23219	16-Jun
Ms.	Deanna L.	Pace	2930 W. Cary St.	Richmond	VA	23211	17-Jun
Ms.	Su	Tarr	702 W. 49th Street	Richmond	VA		2-Jul
Mr.	Fred	Richard	1092 Filbert St.	Stephens City	VA	22655	15-Jun
	E. C.	Woodward	4833 Forestglade Circle	Stone Mountain	VA		12-Jun
Mr.	Michael L.	Bosworth	357 Ayr Hill Ave, NE.	Vienna	VA	22180	8-Jun
Ms.	Pamela A.	Marker	2517 Cove Pl.	Virginia Beach	VA	23454	2-Jul
Mr.	Bobby	C.	419 E. Duke of Gloucester St.	Williamsburg	VA	23185	2-Jul
Mr.	Thomas	DeRose	112 Caran Rd.	Williamsburg	VA	23185	2-Jul
Ms.	Betsy	Eckard	129 Patrick Henry Dr.	Williamsburg	VA	23185	2-Jul
Mr.	Michael	Eckard	129 Patrick Henry Dr.	Williamsburg	VA	23185	2-Jul
Mr.	Tyan	Fletcher	108 Wetherburn Lane	Williamsburg	VA	23188	6-Jul
Ms.	Joyce	Garner	104 Springfield Dr.	Williamsburg	VA	23185	2-Jul

Title	First Name	Last Name	Address	City	State	Zip Code	Date received
Mr.	Thomas William	Gore	4008 Governors Sq. #2	Williamsburg	VA	23188	2-Jul
Mr.	Mark	Howell	140 West Queens Dr.	Williamsburg	VA	23185	2-Jul
Ms.	Joy E.	Pankoe	185 #9 Merrimac Trail	Williamsburg	VA	23185	2-Jul
	Brandy C.	Smith	195 Barlow Road	Williamsburg	VA	23188	2-Jul
Mr.	John	Wright	117 Thomas Gates	Williamsburg	VA	23185	2-Jul
COL	James D.	Muller, USARET	104 Quantico Loop	Yorktown	VA	23693	17-Jun
Ms.	Amanda	Thompson	303 Marl Ravine Rd.	Yorktown	VA	23692	2-Jul
	Leah	Thompson	303 Marl Ravine Rd.	Yorktown	VA	23692	2-Jul
Ms.	Susan	Shea	RED 2, Box 181	Randolph	VT	5060	10-Jun
	Jay	Fox	Bx 175	Beaver	WA	98305	26-Jun
Ms.	Sharon	Fox	Bx 175	Beaver	WA	98305	26-Jun
Ms.	Kara	Beckham	3035 165th Pl. NE.	Bellevue	WA	98008	30-Jun
Ms.	Heidi	Gobleman	608 168th Pl. NE	Bellevue	WA	98008	30-Jun
Ms.	Stacy	Okubo	15216 NE. 16th Pl #47	Bellevue	WA	98007	30-Jun
Ms.	Kristina	Wells	615 168th PL. NE.	Bellevue	WA	98008	30-Jun
	G.	Anchambrult	3202 173rd Ave NE.	Redmond	WA	98052	30-Jun
Ms.	Theresa	Mangahas	5417 154th Ave NE.	Redmond	WA	98052	30-Jun
Ms.	Eva	Stomberg	26327 64th Ave NW	Stanwood	WA	98292	8-Jul
Mr.	Karl E.	Stomberg	26327 64th Ave NW	Stanwood	WA	98292	8-Jul
Mr.	Harry	Metz	3702 SE 139th Avenue	Vancouver	WA	98683	9-Jun
Mr.	Gerold	Mikulsky	3745 South Alley St.	Green Boy	WI	54301	6-Jul
Mr.	R.	Oppedahl	116 Jones Rd.	Washburn	WI	54891	18-Jun
Ms.	Ruth	Oppedahl	116 Jones Rd.	Washburn	WI	54891	19-Jun
Ms.	Leah	Osman	23 Menominee Road	Williams Bay	WI	53191	16-Jun
Ms.	Judith M.	Townsend	155 W. Geneva St.	Williams Bay	WI	53191	17-Jun
Mr.	Ingo	Vormann	Rue Des Clercs 26, 7000 Mons	Belgium			11-Jun
Ms.	Kristin	Eckhardt	36 Craydon Dr., Ontario	Canada		L2n1L3	19-Jun
Ms.	Cheryl A.	Watson	2 Wynn St., Ontario	Canada		L2n1L3	19-Jun

Crescent Towing Company

Crescent Towing

Mr. William Bailey
US Army Corps of Engineers
Planning Division
Environmental Resources Branch
PO Box 889
100 W. Oglethorpe Avenue
Savannah, Georgia 31402

June 30, 1998

Dear Mr. Bailey,

On behalf of our entire organization, I/we are writing in full support of the proposed Savannah Harbor Deepening Project.

In recent years the size of ships in the Port of Savannah has grown far beyond levels previously predicted. Specifically, Savannah is seeing the large containerships today that were previously not projected to call the port for another 20 years. As a result of this growth in vessel size, the Savannah River Navigation Channel is not capable of adequately accommodating many of the ships now call on the port. This inadequacy in channel depth forced over 52% of container ships serving the port of Savannah in 1996 to either load to less than capacity (light-load) or wait until high tide to transit the channel. Such operational constraints lead to dramatic increases in transportation costs which are subsequently passed on to consumers and can ultimately force port users to seek more readily accessible facilities. Furthermore, as the world marketplace continues to grow, so too will these larger ships.

According to the Savannah Harbor Deepening Feasibility Study Report, significant changes will occur in the fleet of vessels utilizing the Port of Savannah, and the current 42' mean low water (mlw) channel depth will become increasing inadequate. According to tables 5-7, 5-8, and 5-9 of that Report:

1. Calls by vessels of less than 38 feet of design draft will increase by over 640 percent.

Hutchinson Island
Post Office Box 2704, Savannah, Georgia 31402
Office (912) 236-2571 FAX (912) 236-0878

2. Deep draft vessels (those drafting more than 38 feet) calls will increase by over 445 percent.
3. The first Post Panamax II vessel will call Savannah within the next decade if the channel is deepened to 46 feet in depth or greater.
4. Post-Panamax vessels will not be placed in Savannah-calling rotations unless the channel is greater than 44 feet in depth or vessels are operated light-loaded (greater or equal to seven feet).
5. Overall vessel calls will increase by over 530 percent, averaging almost 4 percent per year.

These predictions clearly show the increased demands that will be placed on the Port of Savannah and the capacities necessary to accommodate those demands.

Furthermore, a 1997 Economic Impact Study showed that Georgia's public and private port terminals directly and indirectly impact 80,100 jobs, $1.8 billion in wages, $23 billion in revenue, and $585 million in state and local taxes annually. The Port of Savannah is the key component in the generation of those dynamic figures and serves as a conduit for balanced trade between over 20 states in the Southeast and the International marketplace. Thus, maintenance of an adequately navigable shipping channel at the port is critical to Georgia and the United States. Failure to meet the requirements of vessels utilizing the Port of Savannah now and into the future will pose serious economic implications to our shipping industry.

To insure that the current success and future growth opportunities of Georgia’s shipping, industry are preserved, we urge the US Army Corps of Engineers and the Congress to move for immediate authorization of the Savannah Harbor Deepening Project via the Water Resource Development Act of 1998.

Sincerely,
Crescent Towing

Edward W. Bazemore
Vice President

CC: The Honorable Paul Coverdell
United States Senate
Washington, DC 20410
Fax: (202) 228-3783

The Honorable Max Cleland
United States Senate
Washington, DC 20510
Fax: (202) 224-0072

The Honorable Jack Kingston

United States House of Representatives
Washington, DC 20515
Fax: (202) 226-2269

The Honorable Floyd Adams
Mayor City of Savannah
PO Box 1027
Savannah, Georgia 31402
Fax: (912) 651-6805

CDR Ravmond Seebald - Captain of the Port
United States Coast Guard
222 W. Oglethorpe Ave. Suite 402
Savannah, Georgia 3140
Fax:. (912) 652-4052

Mr. Doug J. Marchand - Executive Director
Mr. David A. Shaller - Deputy Executive Director
Mr. lames C. McCurry - Port Planning and Harbor Development
Georgia Ports Authority
PO Box 2406
Savannah, Georgia 31402
Fax: (912) 964-3855 and 966-3615

Mr. Charles Sutlive
Executive Director
Savannah Maritime Association
33 Bull Street Suite 550
Savannah, Georgia 31401
Fax: (912) 212-1733

Mr. Richard Rominger
President elect (September 98)
US Propeller Club, Port of Savannah
Fax: (912) 236 558

Letter response

Crescent Towing

Hutchinson Island
Post Office Box 2704
Savannah, Georgia 31402

Date: June 30, 1998

1. **COMMENT:** On behalf of our entire organization, I/we are writing in full support of the proposed Savannah Harbor Deepening Project.

RESPONSE: No response necessary.

2. COMMENT: In recent years the size of ships in the Port of Savannah has grown far beyond levels previously predicted. Specifically, Savannah is seeing the large containerships today that were previously not projected to call the port far another 20 years. As a result of this growth in vessel size, the Savannah River Navigation Channel is not capable of adequately accommodating many of the ships now call on the port. This inadequacy in channel depth forced over 52% of container ships serving the port of Savannah in 1996 to either load to less than capacity (light-load) or wait until high tide to transit the channel. Such operational constraints lead to dramatic increases in transportation costs that are subsequently passed on to consumers and can ultimately force port users to seek more readily accessible facilities. Furthermore, as the world marketplace continues to grow, so too will these larger ships.

RESPONSE: The need for the project has been economically justified.

3. COMMENT: Significant changes will occur in the fleet of vessels using the Port of Savannah, and the current 42' MLW channel depth will become increasing inadequate. These predictions clearly show the increased demands that will be placed on the Port of Savannah and the capacities necessary to accommodate those demands.

RESPONSE: The need for the project has been economically justified.

4. COMMENT: Furthermore, a 1997 Economic Impact Study showed that Georgia's public and private port terminals directly and indirectly impact 80,100 jobs, $1.8 billion in wages, $23 billion in revenue, and $585 million in state and local taxes annually. The Port of Savannah is the key component in the generation of those dynamic figures and serves as a conduit for balanced trade between over 20 states in the Southeast and the International marketplace. Thus, maintenance of an adequately navigable shipping channel at the port is critical to Georgia and the United States. Failure to meet the requirements of vessels

utilizing the Port of Savannah now and into the future will pose serious economic implications to our shipping industry.

RESPONSE: The need for the project has been economically justified.

5. COMMENT: To insure that the current success and future growth opportunities of Georgia's shipping, industry are preserved, we urge the Corps and the Congress to move for immediate authorization of the Savannah Harbor Deepening Project via the WRDA of 1998.

RESPONSE: The need for the project has been economically justified.

East Coast Ternimal Company
CONBULK MARINE TERMINALS GROUP
EAST COAST TERMNAL CO.
A subsidiary of Peeples Industries, Inc.
Orlean Building; 6001 Chatham Center Drive; Suite 350
Savannah, Georgia 31405
P.O. Box 2647
Savannah, Georgia 31402

June 19, 1998

Mr. William G. Bailey
U.S. Army Corps of Engineers, PD-E
Post Office Box 889
Savannah, GA 31402-0889
Re: GPA Savannah Harbor Expansion

Dear Mr. Bailey:

We are opposed to the GPA Expansion for the Savannah Harbor.

In the recent past deepening project, we have been severely damaged to the extent of millions of dollars because the bank erosion caused by said deepening project which has undermined our facilities. Any further deepening, as outlined by the proposed deepening will only intensify our damages. We are concerned with the possibility of one way ship traffic and its adverse impact on our shipping customers. We are concerned with the negative impact on the Savannah River water quality with increase salinity. This will reduce the dissolved oxygen on UDS's in the upper harbor and what this will do to future maintenance dredging costs for the Savannah Harbor.

In conclusion we oppose this project because of the present undermining of our deep water terminal; the negative impact on our present deep water terminal business; the negative impact on our present manufacturing business; and the negative impact on our present maintenance dredging.

Sincerely,
EAST COAST TERMINAL CO.

John R. Benton, Jr.
Senior Vice President

Orlean Building 6001 Chatham Center Drive, Suite 350 Savannah, Georgia 31405
P.O. Box 2647 Savannah, Georgia 31402(912) 235-4850 FAX (912) 238-5524
Letter response
CONBULK MARINE TERMINALS GROUP
EAST COAST TERMNAL CO.

A subsidiary of Peeples Industries, Inc.
Orlean Building; 6001 Chatham Center Drive; Suite 350
Savannah, Georgia 31405
P.O. Box 2647
Savannah, Georgia 31402

June 19, 1998

1. COMMENT: We are opposed to the GPA Expansion for the Savannah Harbor.

RESPONSE: No response necessary.

2. COMMENT: In the recent past deepening project, we have been severely damaged to the extent of millions of dollars because the bank erosion caused by said deepening project which has undermined our facilities. Any further deepening, as outlined by the proposed deepening will only intensify our damages. We are concerned with the possibility of one way ship traffic and its adverse impact on our shipping customers. We are concerned with the negative impact on the Savannah River water quality with increase salinity. This will reduce the dissolved oxygen on UDS's in the upper harbor and what this will do to future maintenance dredging costs for the Savannah Harbor.

RESPONSE: (1) Bank erosion - East Coast Terminal has been in litigation with the District over this issue for several years and comment on this matter is inappropriate at this time.

(2) One-way traffic – The deepened channel will not alter the practices the pilots currently use in bringing Panamax vessels into the harbor. Two way traffic for these vessels will not be restricted and vessels may meet and pass under conditions the pilots determine are safe. It is not possible to design a channel to accommodate two-way traffic for post-Panamax vessels with the development that exists on the banks of the river. Movement of vessels will require coordination when post-Panamax vessels are transiting the project.

(3) Impact on UDS's – The project will not have an adverse impact on the future use of confined disposal sites located in the upper harbor. Disposal area 2A will not be used for the expansion dredging. All material dredged upstream of the Talmadge Bridge will be pumped to disposal area 12A. In addition, the expansion dredging will provide suitable material which can be used for future dike improvement projects.

(4) Impact on future maintenance dredging (DO impacts) – One of the project features includes reaeration of the river to mitigate for the predicted reduction of DO in the river. This feature is being included in the preliminary project design and cost estimates and is being incorporated into the revised project documents and project cost estimate.

3. COMMENT: In conclusion we oppose this project because of the present undermining of our deep water terminal; the negative impact on our present deep water terminal business; the negative impact on our present manufacturing business; and the negative impact on our present maintenance dredging.

RESPONSE: No response necessary.

Engelhard Corporation
ENGELHARD

ENGELHARD CORPORATION
SAVANNAH OPERATIONS
1800 E. PRESIDENT STREET
SAVANNAH, GEORGIA 31404
OFFICE: (912) 651-1220
FAX: (912) 651-1242

July 2, 1998

Mr. Myron Yuschishin
Department of the Army
Corps of Engineers
Savannah District
Post Office Box 889
Savannah, GA 31402-0889

RE: Savannah Harbor - Draft Environmental Impact Statement

Dear Mr. Yuschishin:

Engelhard Corporation appreciates the opportunity to provide comments regarding the Savannah Harbor Deepening Project that is currently under study. As a member of the Greater Savannah business community and a major shipper of kaolin and petroleum catalyst products through the Port of Savannah, Engelhard supports the concept of increasing the depth of the harbor if it will improve the competitiveness of Savannah's ocean freight rates and provide for economic growth for the region. However, there are some issues that must be addressed as part of this project in order for Engelhard Corporation to offer its full support. Specifically, projected environmental impacts relating to Dissolved Oxygen (DO) depletion and the potential impact on the water quality of the City of Savannah's I&D Water Treatment facility (of which Engelhard Savannah is a customer) are both concerns which need to be addressed.

As a member of the Savannah Area Chamber of Commerce's Manufacturers Council, Engelhard is aware that substantial comments are being provided by public and private organizations regarding this project. Engelhard Corporation supports the comments provided by the City of Savannah, specifically as those comments relate to the DO depiction and the increased levels of chloride and bromide that may occur due to the current location of the water intake.

In order for Engelhard Corporation to fully support the Savannah Harbor Deepening Project, economic provisions must be included in the project funding to provide for the full cost of mitigating depletion in DO. Additionally, the project must address the water

quality issues related to the City's I&D facility in a way that eliminates any negative financial impact on the City or its water customers. Assuming these issues are accommodated, Engelhard Corporation supports the project.

Again, thank you for the opportunity to comment on this project and please feel free to contact me should you have any questions at (912) 651-1226.

Sincerely,

Tom D. McAdams
General Manager

Letter response
ENGELHARD CORPORATION
SAVANNAH OPERATIONS
1800 E. PRESIDENT STREET
SAVANNAH, GEORGIA 31404

Date: July 2, 1998

1. COMMENT: As a member of the Greater Savannah business community and a major shipper of kaolin and petroleum catalyst products through the Port of Savannah, Engelhard supports the concept of increasing the depth of the harbor if it will improve the competitiveness of Savannah's ocean freight rates and provide for economic growth for the region. However, there are some issues that must be addressed as part of this project in order for Engelhard Corporation to offer its full support. Specifically, projected environmental impacts relating to Dissolved Oxygen (DO) depletion and the potential impact on the water quality of the City of Savannah's I&D Water Treatment facility (of which Engelhard Savannah is a customer) are both concerns which need to be addressed.

RESPONSE: The proposed project was revised in the final study documents to include funding for mitigation of adverse impacts on dissolved oxygen in the harbor and chlorides at the City's industrial water intake.

2. COMMENT: Engelhard Corporation supports the comments provided by the City of Savannah, specifically as those comments relate to the DO depiction and the increased levels of chloride and bromide that may occur due to the current location of the water intake.

RESPONSE: The proposed project was revised in the final study documents to include funding for mitigation of adverse impacts on dissolved oxygen in the harbor and chlorides at the City's industrial water intake.

3. COMMENT: In order for Engelhard Corporation to fully support the Savannah Harbor Deepening Project, economic provisions must be included in the project funding to provide for the full cost of mitigating depletion in DO. Additionally, the project must address the water quality issues related to the City's I&D facility in a way that eliminates any negative financial impact on the City or its water customers. Assuming these issues are accommodated, Engelhard Corporation supports the project.

RESPONSE: The proposed project was revised in the final study documents to include funding for mitigation of adverse impacts on dissolved oxygen in the harbor and chlorides at the City's industrial water intake. This meets the conditions that Engelhard Corporation stated for its support of this project.

Evergreen America Corporation

EVERGREEN AMERICA CORPORATION

ONE EVERGREEN PLAZA, JERSEY CITY, N.J. 07302
TEL.: (201) 915-3200
TELEX: 427394 GREEN UI, 427433 GREEN UI, 428665 GREEN UI

June 25, 1998

Mr. William Bailey
U.S. Army Corps of Engineers
Planning Division
Environmental Research Branch
P.O. Box 889
100 W. Oglethorpe Avenue
Savannah, GA 31402

Dear Mr. Bailey:

It is great to learn that the Georgia Ports Authority has a valuable project in maintaining and upgrading land-side and water-side infrastructure. Particularly, it is going to deepen the Savannah River Channel from the current 42' MLW to 50' MLW.

In reviewing the seaports worldwide, they are all facing the growing size of vessels in the international fleet. To provide adequate draft to accommodate these ships for the foreseeable future, it is urgent and necessary. Therefore, this valuable project needs immediate attention without any time delay. Otherwise, your Port will be far behind the other Ports prepared for tomorrow.

We, Evergreen, as one of the major shipping lines calling your good Port, fully support your great project and would like to see this successfully completed in the near future.

Sincerely,

Owen Wu
President

kb

CC: Byron X. Hock
Director of Trade Development
Georgia Ports Authority

continued...

CC: The Honorable Senator Paul Coverdell
2 East Bryan Street
Savannah, GA 31401

The Honorable Senator Max Cleland
75 Spring Street SW
Atlanta, GA 30303

The Honorable Representative Jack Kingston, First District
6605 Abercorn Street, Suite 102
Savannah, GA 31406

The Honorable Governor Zell Miller
Governor of Georgia
203 State Capitol
Atlanta, GA 30334

The Honorable Mayor Floyd Adams, Jr.
City Hall
P.O. Box 1027
Savannah, GA 31402

Letter response

EVERGREEN AMERICA CORPORATION
ONE EVERGREEN PLAZA
JERSEY CITY, N.J. 07302

June 25, 1998

1. COMMENT: It is great to learn that the Georgia Ports Authority has a valuable project in maintaining and upgrading land-side and water-side infrastructure. Particularly, it is going to deepen the Savannah River Channel from the current 42' MLW to 50' MLW.

RESPONSE: No response necessary.

2. COMMENT: In reviewing the seaports worldwide, they are all facing the growing size of vessels in the international fleet. To provide adequate draft to accommodate these ships for the foreseeable future, it is urgent and necessary. Therefore, this valuable project needs immediate attention without any time delay. Otherwise, your Port will be far behind the other Ports prepared for tomorrow.

RESPONSE: No response necessary.

3. COMMENT: We, Evergreen, as one of the major shipping lines calling your good Port, fully support your great project and would like to see this successfully completed in the near future.

RESPONSE: No response necessary.

Fort James Corporation
P.O. Box 828
Rincon, Georgia 31326-0828
Telephone 912-826-6516
Facsimile 912-826-2363

Savannah River Mill

June 18, 1998

Col. Grant M. Smith
U.S. Corps of Engineers
Savannah District
100 W. Oglethorpe Ave.
Savannah, GA 31402-0889

Ref: Harbor Deepening Proposal from 42' to 50'

Fort James Corporation is a Fortune 200 company with more than 27,000 employees worldwide and more than 1600 in the state of Georgia. 1200 of those employees work in the Savannah River Mill in Effingham County, producing 900 tons per day of finished product. The company has invested more than 800 million dollars in the Savannah River Mill and we have a keen interest in any developments that may impact our ability to continue operations at the mill.

This letter is to voice the concern of the company with regard to the proposed deepening of the Savannah River Harbor from 42 feet to 50 feet. Our concern is not with the concept of the proposed project, but rather with the effect it could have on direct dischargers if the environmental impact is not mitigated by the proposing agency.

We are extremely concerned with any changes in the river classification, TMDLS, saltwater intrusion and to NPDES permits. We have not been allowed to evaluate the model being used to develop the environmental impact study, nor have we had sufficient time to review the document and its effect on our facility.

Other companies with facilities along the river have presented in-depth comments on the proposed deepening project. Our concerns are consistent with many of those expressed by other companies. There has not been sufficient time to adequately assess the potential impact on our facility, nor has a cost-benefit analysis been published.

While we understand the GPA's desire to deepen the harbor, our company will see little or no benefit from the project. The deepening project, if allowed to go forward as proposed, is

likely to cause us several problems and subject us to more stringent regulation if any adverse impact is not mitigated by the proposing agency.

We would respectfully request an extension of the comment period so that we can more carefully review the proposal. If there are any questions, please contact us.

Very truly yours,
FORT JAMES CORPORATION

Charles M. MacDonald, P.E.

Letter response

Fort James Corporation

P.O. Box 828
Rincon, Georgia 31326-0828

Savannah River Mill

June 18, 1998

1. COMMENT: We are extremely concerned with any changes in the river classification, TMDLS, saltwater intrusion and to NPDES permits. We have not been allowed to evaluate the model being used to develop the environmental impact study.

RESPONSE: No direct changes in river classification, TMDLS, or NPDES permits are expected to result from implementation of this proposed project. Projected increases in saltwater intrusion are described in the EIS in Section 5.3.1. Supplemental reports that describe the hydrodynamic model developed by ATM for this study were provided to all parties that requested them.

2. COMMENT: A cost-benefit analysis on the project has not been published.

RESPONSE: The study documents included a cost:benefit evaluation which included all costs that could be reasonably certain to result from the implementation of the proposed project.

3. COMMENT: The deepening project, if allowed to go forward as proposed, is likely to cause us several problems and subject us to more stringent regulation if any adverse impact is not mitigated by the proposing agency.

RESPONSE: No direct impacts to Fort James property are believed to result from implementation of the proposed project. Although the potential exists for more stringent environmental regulations in the future, no degree of certainty can be established at this time concerning the extent or timing of those changes. Such changes are not under the jurisdiction or control of either GPA or the Army Corps of Engineers. The degree to which expected decreases in dissolved oxygen levels under certain conditions could lead regulatory agencies to revise existing discharge permits is unknown and beyond the scope of this study.

4. COMMENT: There has not been sufficient time to adequately assess the potential impact on our facility. We request an extension of the comment period so that we can more carefully review the proposal.

RESPONSE: Savannah District granted a 15-day extension of the review period to allow more time for interested parties to review and comment on the proposed project.

Georgia Conservancy

The Georgia Conservancy
1176 Peachtree Street
Suite 400 South
Atlanta, Georgia 30309

June 19, 1998

Mr. Myroslaw Yuschishin
Savannah District, U.S. Army Corps of Engineers
CESAS-PD
Box 889
Savannah, GA 31402-0889

RE: SAVANNAH HARBOR DEEPENING PROJECT

Dear Mr. Yuschishin,

The Georgia Ports Authority has proposed a plan to deepen the Savannah River's shipping channel from 42 feet to as much as 50 feet. The reason for the proposed deepening is to allow the Ports Authority's Garden City docks to accommodate heavily laden ships, and to be able effectively to compete with the harbor in Charleston, SC. The Georgia Conservancy understands the need to be competitive in order to encourage healthy economic growth. We also believe that it is extremely important to balance the demands of economic progress with a commitment to protect the vital natural resources that sustain us in many ways. Finding that balance is difficult, but is what the Georgia Conservancy strives for in dealing with most of the issues we address.

The proposal to deepen the shipping channel by as much as eight feet undoubtedly will help to make the Garden City docks a more attractive shipping terminal than any other in the southeastern United States. But the proposal and the Environmental Impact Statement raise several environmental questions which cause us concern. Among these are probable impacts to wetlands, specifically tidal freshwater marsh, fisheries, and sand transport.

Tidal freshwater marsh is an extremely valuable component of the coastal Georgia ecosystem, in that it contains a great diversity of plant species, provides habitat for a great diversity of wildlife, and plays a critical role in maintaining good water quality in our estuaries. We understand that deepening of the channel as proposed will increase the salinity of the water in the Savannah National Wildlife Refuge, and move the location of the freshwater/saltwater interface further upriver, generally, in the Savannah River. The salinity change will degrade the nature and function of the freshwater marsh in the Refuge, and certainly other riparian wetlands, as well. Adverse impacts on the wetlands would also come from the disposal of dredge spoils. The effects of the channel deepening would also very likely have adverse impacts on the river-dwelling striped bass and endangered

shortnose sturgeon, as well as the ocean-dwelling north Atlantic right whale and loggerhead sea turtle. The impacts would come from salinity and dissolved oxygen changes, increasing ship traffic, and changes in the sand transport system.

The characteristics of the coastal Georgia ecosystem – the flora, fauna, geology, and hydrology – define the character of coastal Georgia. They are what attract people to, and drive the thriving ecotourism industry of, the coast. Any project, especially one of this magnitude, should be scrutinized in great detail to fully understand its consequences, both known and unintended, on resources which provide significant economic benefits to the region.

In addition to the environmental concerns stated above, The Georgia Conservancy believes that the Environmental Impact Statement fails to properly analyze alternatives ranging from not deepening the channel to deepening the channel to depths of less than 40 feet.

If the comment period will not be extended, then The Georgia Conservancy recommends that the Environmental Impact Statement not be approved, and that the project be withdrawn, at least until enough time can be spent to properly address these issues, and others likely raised by other concerned stakeholders.

Respectfully submitted,

James F. Durrett, III
Senior VP and COO

Letter response

The Georgia Conservancy
1176 Peachtree Street
Suite 400 South
Atlanta, Georgia 30309

COMMENT: The Georgia Conservancy requests that the public comment period be extended.

RESPONSE: Savannah District granted a 15-day extension to the public review period.

Georgia Economic Developers Association, Inc.

GEDA
GEORGIA ECONOMIC DEVELOPERS ASSOCIATION, INC
285 Peachtree Center Avenue ** P.O. Box 1776 ** Atlanta, Georgia 30301-1776 ** (404) 656-7790

July 1, 1998

Mr. William Bailey
U.S. Army Corps of Engineers
Planning Division, Environmental Research Branch
P.O. Box 889
100 W. Oglethorpe Avenue
Savannah, GA 31402

Re: Savannah Harbor Deepening Project

Dear Mr. Bailey:

The Georgia Economic Developers Association (GEDA) represents more than 1,000 economic development professionals across Georgia. The Georgia communities, businesses, and organizations represented by our diverse membership have a vital interest in the maintenance and improvement of all aspects of our state's transportation infrastructure, including the competitive operation of our Georgia ports.

GEDA recognizes the significance of market changes affecting our ports, including the rapidly growing demand for port access by large containerships. We also understand and appreciate the significant economic benefit that Georgia enjoys as a result of our port facilities. Clearly, the competitiveness of the Port of Savannah represents a vital economic interest for Georgia.

We would like to urge that all necessary steps related to the proposed Savannah Harbor Deepening Project be completed as soon as possible, including the completion of appropriate environmental impact studies. We understand that further work in this regard requires an authorization from your office. We respectfully request that this authorization be granted so that work may continue without delay.

We understand that some questions may have been raised by others relative to the project's potential impacts on certain natural resources in the vicinity and on the withdrawal of water for use by existing industries. Without addressing the merits of these specific questions, we believe that such issues should and can be appropriately addressed by moving forward with the necessary studies as soon as possible.

GEDA urges that your office grant the appropriate authorization so that the Savannah Harbor Deepening Project work may move forward. Thank you for your consideration of our views.

Sincerely,

Cullen C. Larson
Executive Director

cc: Senator Paul Coverdell
Senator Max Cleland
Congressman Jack Kingston

Letter response

GEORGIA ECONOMIC DEVELOPERS ASSOCIATION, INC
285 Peachtree Center Avenue
P.O. Box 1776
Atlanta, Georgia 30301-1776

Date: July 1, 1998

1. COMMENT: GEDA represents more than 1,000 economic development professionals across Georgia. The Georgia communities, businesses, and organizations represented by our diverse membership have a vital interest in the maintenance and improvement of all aspects of our state's transportation infrastructure, including the competitive operation of our Georgia ports.

RESPONSE: The Port of Savannah serves the citizens of Georgia, the Southeast, and much of the eastern half of the US. Deepening the harbor would improve the efficiency of transporting goods through Savannah, lowering the cost of goods moved to citizens within that impact area.

2. COMMENT: GEDA recognizes the significance of market changes affecting our ports, including the rapidly growing demand for port access by large containerships. We also understand and appreciate the significant economic benefit that Georgia enjoys as a result of our port facilities. Clearly, the competitiveness of the Port of Savannah represents a vital economic interest for Georgia.

RESPONSE: The proposed project would allow the Port of Savannah to retain its present competitive position among the south Atlantic ports.

3. COMMENT: We would like to urge that all necessary steps related to the proposed Deepening Project be completed as soon as possible, including the completion of appropriate environmental impact studies. We understand that further work in this regard requires an authorization from your office. We respectfully request that this authorization be granted so that work may continue without delay.

RESPONSE: The remaining environmental studies would begin as soon as the proposed project is authorized by Congress.

4. COMMENT: We understand that some questions may have been raised by others relative to the project's potential impacts on certain natural resources in the vicinity and on the withdrawal of water for use by existing industries. Without addressing the merits of these specific questions, we believe that such issues should and can be appropriately

addressed by moving forward with the necessary studies as soon as possible.

RESPONSE: The remaining studies would begin as soon as the proposed project is authorized by Congress.

Georgia Steamship Company

GEORGIA STEAMSHIP CO.
AZTEC TRADING CO., S.A.

A Subsidiary of
GEORGIA-PACIFIC CORPORATION

End of Crossgate Road
P.O. Box 4226
Port Wentworth, Georgia 31407
Telephone (912) 964-8624
Fax (912) 966-5254
Telex 546438 AZTEC SAV

July 7, 1998

To: U. S. Army Corps of Engineers
Attn: Colonel Joseph Schmitt
Fax: (912) 652-5222

Dear Colonel Schmitt,

Georgia-Pacific has two issues we would like addressed during the comment period. These are the scope of the project which does not include the upper reaches of the Savannah Harbor and the issue of one-way traffic during transit of larger vessels.

First, the current scope of this project stops at the Kings Island turning basin just above the Ports Authority, and does not include the last several thousand feet of the Savannah harbor, where there is urgent need of more water for the transit of deep draft vessels. We feel that this issue deserves a second look and inclusion in this project if indeed this project is to address the needs of the Savannah Harbor into the next century.

Second, the issue of one-way traffic has not been adequately examined and needs addressing. If indeed the larger vessels will require the delay of other vessels in transit this issue must be addressed now. It is unacceptable, in our opinion to expect us to delay our vessels to accommodate a wider-deeper vessel. We find the justification given to deepen the channel of eliminating delays to these large vessels at the expense of smaller vessels to be unacceptable. This issue must be addressed more adequately and thoroughly.

We appreciate your attention to these matters and look forward to hearing these issues addressed.

Sincerely,

Kevin M, Russom, Jr.
General Manager

Letter response

GEORGIA STEAMSHIP CO.
AZTEC TRADING CO., S.A.
End of Crossgate Road
P.O. Box 4226
Port Wentworth, Georgia 31407

Date: July 7, 1998

1. COMMENT: Georgia-Pacific has two issues we would like addressed during the comment period. These are (A)the scope of the project, which does not include the upper reaches of the Savannah Harbor, and (B)the issue of one-way traffic during transit of larger vessels.

RESPONSE: a) The inclusion of the upper reach of the Savannah Harbor in this Feasibility Study was not necessary to justify the deepening of the harbor as an economically feasible project. b) The project is designed for one way traffic of the design vessel.

2. COMMENT: The current scope of this project stops at the Kings Island Turning Basin just above the Ports Authority, and does not include the last several thousand feet of Savannah Harbor, where there is urgent need of more water for the transit of deep draft vessels. We feel that this issue deserves a second look and inclusion in this project if indeed this project is to address the needs of the Savannah Harbor into the next century.

RESPONSE: The inclusion of the upper reach of the Savannah Harbor in this Feasibility Study was not necessary to justify the deepening of the harbor as an economically feasible project.

3. COMMENT: The issue of one-way traffic has not been adequately examined and needs addressing. If indeed the larger vessels will require the delay of other vessels in transit, this issue must be addressed now. It is unacceptable to expect us to delay our vessels to accommodate a wider-deeper vessel. We find the justification given to deepen the channel of eliminating delays to these large vessels at the expense of smaller vessels to be unacceptable. This issue must be addressed more adequately and thoroughly.

RESPONSE: The Economic Appendix adequately addresses this potential project impact.

GEORGIA STEVEDORE ASSOCIATION
33 BULL STREET, SUITE 550
SAVANNAH, GEORGIA 31401
TELEPHONE 912-233-0488 FAX 912-236-3261

July 2, 1998
Ref: 07-195-98/21.11

Mr. William Bailey
U.S. Army Corps of Engineers
Planning Division
Environmental Research Branch
P.O. Box 889
100 W. Oglethorpe Avenue
Savannah, GA 31402

Dear Mr. Bailey,

On behalf of the Georgia Stevedore Association, I/We are writing in support of the proposed Savannah Harbor Deepening Project.

In recent years, the size of ships utilizing the Port of Savannah has grown far beyond levels previously predicted. Specifically, Savannah is seeing the large containerships today that previously not projected to call the port for another 20 years. As a result of this growth in vessel size, the Savannah River Navigation Channel is not capable of adequately accommodating many of the ships now calling on the Port. This inadequacy in channel depth forced over 52% of container ships serving the port of Savannah in 1996 to either load less than capacity (light-load) or wait until high tide to transit the channel. Such operational constraints lead to dramatic increases in transportation cost which are subsequently passed on to consumers and can ultimately force port users to seek more readily accessible facilities. Furthermore, as the world marketplace continues to grow, so too will these larger ships.

According to the Savannah Harbor Deepening Feasibility Study Report, significant changes will occur in the fleet of vessels utilizing the Port of Savannah, and the current 42' mean low water (m/w) channel depth will become increasingly inadequate. According to Tables 5-7, 5-8, and 5-9 of that Report,

1. Calls by vessels of less than 38 feet of design draft will increase by over 640 percent.

2. Deep draft vessels (those drafting more than 38 feet) calls will increase by over 445 percent.

3. The first post-panamax II vessel will call Savannah within the next decade if the channel is deepened to 46 feet in depth or greater.

4. Post-Panamax vessels will not be placed in Savannah - calling rotations unless the channel is greater then 44 feet in depth or vessels are operated light-load (greater or equal to seven feet.)

5. Overall vessel calls will increase by over 530 percent, averaging almost 4 percent per year.

These predictions clearly show the increased demands that will be placed on the port of Savannah and the capacities necessary to accommodate those demands.

Furthermore, a 1997 Economic Impact Study showed that Georgia's public and private port terminals directly and indirectly impact 80,100 jobs, $1.8 billion in wages, $23 billion in revenue, and $585 million in state and local taxes annually. The Port of Savannah is the key component in the generation of those dynamic figures and serves as a conduit for balanced trade between over 20 states in the Southeast and the international marketplace. Thus, maintenance of an adequately navigable shipping channel at the port is critical to Georgia and the United States. Failure to meet the requirements of vessels utilizing the Port of Savannah now and into the future will pose serious economic implications to our shipping industry.

To insure that the current success and future growth opportunities if Georgia's shipping industry are preserved, I/We urge the U.S. Army Corp of Engineers and the congress to move for immediate authorization of the Savannah Harbor Deepening Project via the Water Resource Development Act of 1998.

Very truly yours,

Stephen W. Zadach
President

CC: Senator Paul Coverdale
Senator Max Cleland
Congressman Jack Kingston

Letter response

GEORGIA STEVEDORE ASSOCIATION
33 BULL STREET, SUITE 550
SAVANNAH, GEORGIA 31401

Date: July 2, 1998

1. COMMENT: In recent years, the size of ships using the Port of Savannah has grown far beyond levels previously predicted. Specifically, Savannah is seeing the large containerships today that previously not projected to call the port for another 20 years. As a result of this growth in vessel size, the Navigation Channel is not capable of adequately accommodating many of the ships now calling on the Port. This inadequacy in channel depth forced over 52% of container ships serving the Port in 1996 to either load less than capacity (light-load) or wait until high tide to transit the channel. Such operational constraints lead to dramatic increases in transportation cost which are subsequently passed on to consumers and can ultimately force port users to seek more readily accessible facilities. Furthermore, as the world marketplace continues to grow, so too will these larger ships.

RESPONSE: The need for the project has been economically justified.

2. COMMENT: According to the Feasibility Study Report, significant changes will occur in the fleet of vessels using the Port of Savannah, and the current 42' MLW channel depth will become increasingly inadequate. According to Tables 5-7, 5-8, and 5-9 of that Report:

1. Calls by vessels of less than 38 feet of design draft will increase by over 640 percent.
2. Deep draft vessels (those drafting more than 38 feet) calls will increase by over 445 percent.
3. The first post-panamax II vessel will call Savannah within the next decade if the channel is deepened to 46 feet in depth or greater.
4. Post-Panamax vessels will not be placed in Savannah - calling rotations unless the channel is greater then 44 feet in depth or vessels are operated light-load (greater or equal to seven feet.)
5. Overall vessel calls will increase by over 530 percent, averaging almost 4 percent per year.

These predictions clearly show the increased demands that will be placed on the port of Savannah and the capacities necessary to accommodate those demands.

RESPONSE: The need for the project has been economically justified.

3. COMMENT: Furthermore, a 1997 Economic Impact Study showed that Georgia's public and private port terminals directly and indirectly impact 80,100 jobs, $1.8 billion in wages, $23 billion in revenue, and $585 million in state and local taxes annually. The Port of Savannah is the key component in the generation of those dynamic figures and serves as a conduit for balanced trade between over 20 states in the Southeast and the international marketplace. Thus, maintenance of an adequately navigable shipping channel at the port is critical to Georgia and the United States. Failure to meet the requirements of vessels using the Port of Savannah now and into the future will pose serious economic implications to our shipping industry.

RESPONSE: The need for the project has been economically justified.

4. COMMENT: To insure that the current success and future growth opportunities if Georgia's shipping industry are preserved, I/We urge the Corps and Congress to move for immediate authorization of the Deepening Project via the WRDA of 1998.

RESPONSE: No response necessary.

HUNTER, MACLEAN, EXLEY & DUNN, P.C.
ATTORNEYS AT LAW
200 EAST SAINT JULIAN STREET
SAVANNAH, GEORGIA 31401

SAVANNAH OFFICE:
POST OFFICE BOX 9848
SAVANNAH, GEORGIA 31412-0048
TELEPHONE: (912) 236-0261
FACSIMILE: (912) 236-4936

ATLANTA OFFICE:
1366 PEACHTREE STREET, N.E.; SUITE 1050
ATLANTA, GEORGIA 30309
TELEPHONE: (404) 876-3611
FACSIMILE: (404) 870-2025

ANDREW H. ERNST
SAVANNAH OFFICE

July 6, 1998

U.S. Army Corps of Engineers
Planning Division
Environmental Resources Branch
Attn: Mr. William Bailey
P.O. Box 899
Savannah, GA 31402-0899

Re: Joint Public Notice, Savannah Harbor Expansion

Gentlemen:

Please be advised this firm represents Blue Circle Cement, Inc. which owns property on Hutchinson Island immediately adjacent to the Savannah River. Blue Circle's facility is an import/distribution terminal which handles cement transported by both ship and barge into and out of the facility. Last year Blue Circle handled in excess of 250,000 tons of product which was distributed throughout the entire southeast. Major portions of the facility consist of docks, service roads and 16 silos which have 32,000 tons of capacity.

Past harbor widening and deepening projects have already adversely impacted our client. The miscalculation of slope ratios associated with past projects has undermined and jeopardized the service road which fronts Blue Circle's property as well as other improvements on the property.

Unfortunately, the draft feasibility report and draft environmental impact statement distributed by the Corps does not adequately address all factors or impacts which may result from the proposed harbor expansion. The report acknowledges the necessary ship simulator study which will define the channel design and the location of various "harbor wideners"

has not been conducted. Until these important studies are undertaken it is impossible to understand what impacts adjacent property owners may experience as a result of this project.

Blue Circle is certainly in favor a viable and active harbor. However, the deepening proposed by GPA and the Corps must be studied more thoroughly and all impacts ascertained beyond doubt prior to project approval. In short, it does little good to approve a project with the caveat that all impacts will be not ascertained until much later. Blue Circle and other property owners adjacent to the Savannah River must know what impacts the proposed project will have on their operations. At this time, those questions remain unanswered.

Attached to this letter you will find a list of concerns raised by Saussy Engineering, Inc. which reviewed both the feasibility, report and the EIS on behalf of Blue Circle. All of these issues need to be adequately studied.

Due to the unanswered questions associated with the harbor deepening project, Blue Circle requests the District Engineer schedule and conduct a public hearing so all impacts associated with the Savannah Harbor expansion can be adequately addressed.

We appreciate the opportunity to provide you with comments associated with the proposed project.

With best regards, I am

Very truly yours,

Andrew H. Ernst

Enclosure

cc: Phil McClendon, Esq.
Mr. Jim Pedrick
Honorable Jack Kingston

SAUSSY ENGINEERING INC
230 HABERSHAM STREET
P,O. BOX 9584
SAVANNAH, GEORGIA 31412

WM. HUNTER SAUSSY, JR. P.E. PHONE (912) 231-5103
PRESIDENT FAX (912)233-1001

MEMORANDUM

TO: Mr. Drew Ernst DATE: June 19, 1998
Hunter, Maclean, Exley &.Dunn P.C.PROJECT: Savh Harbor Deepening
200 E. St. Julian Street, 3rd Floor
Savannah, Georgia 31412
FAX: 236-4936

FROM: Wm, Hunter Saussy, Jr., P,E.

I include below some of my concerns and comments of my review of The Harbor Deepening Studies made preparatory to permitting and engineering design.

1. Refer to Draft Feasibility Studies, Reports, Design Memorandums and Environmental Impact Statement of September 1985, September 1987 and September 1992.

   These have significantly more data to support concerns of the previous programs than the current Draft Environmental Impact Statement for the new deepening particularly in regards to in to technical issues or risks associated.

2. The following should be addressed more comprehensively at this level prior to the permit actions.

   a) Detailed, comprehensive slope stability analysis to determine risk to adjacent riverside structures including docks, wharfs, breasting and mooring dolphins, landside loading areas, etc.

   b) Effect on hydrology of the river due to reduction in velocity, sudden variations of velocities and eddying at new cross section changes at outsets, wideners, turning basin, modifications etc.

c) Effect by modified river hydrology to additional or redistribution of sediment which will increase maintenance costs, operations and disruption by dredging operations.

d) Effect on historical water level rises.

e) Effect on advance maintenance prisms.

f) Fit of channel and wideners to a ship simulator model.

g) Silt disposal areas. Present modifications will reduce volume of Spoil Area 2A.

h) Revisit Corps of Engineers previous studies which showed drafts of 44' as intended limit in long range, 50 year forecasts. Now we are at 50'+. What happens with the next study? Tens of thousand of dollars were spent with the original studies and appears they were now in error.

i) Reduction in width of the Harbor at the -50' mlw level will force larger vessels requiring deeper drafts into the channel path threatening or disrupting two way traffic and impact safety. The 500' wide limit at the -42' mlw depth is minimal or less than required by reference design procedures. Privately owned bulkheads of TIC on Hutchinson Island were designed for increased depths of 4' beyond the projected at the time of construction. The new widener and unexpected depths of the channel have significant losses that were designed to address the earlier harbor forecasts.

j) What are the effects on the renourishment program, wave energy attenuators, etc. at the Savannah Beach end of the channel?

k) What effects will deeper draft vessels have on passing "bow wave" generation during high tide traverse? Risk of "overtopping" walkways such as at the New Trade Center. etc,

l) What are the effects anticipated and the result of studies on the changes in the salt water wedge, limits, dissolved oxygen and silt loads within the various water columns along the river?

m) What are the effects of reducing the littoral tidal velocity and existing and expected eddying effects along shorelines at various insets, dockages and landing zones which entrap silt and result in unexpected fallout because of reduced velocities. Historically, well back into the 1800's and in fact with intents of the former Back River tide gates; maintenance of adequate velocities in the channel was a primary consideration to avoid localized, transient silt deposits left to the

cost of both Federal, State and private industries through maintenance dredging activity, the tedious issuance of maintenance permits, monitoring costs, etc. as well as expensive testing now required.

n) What tests have taken of materials proposed to be removed along wideners, etc. and is it any way harmful to the storage areas. Does it contain any hazardous or unsatisfactory materials?

DISTRIBUTION: Jim Pedrick, Blue Circle Cement, Inc.

Letter response

HUNTER, MACLEAN, EXLEY & DUNN, P.C.
ATTORNEYS AT LAW
200 EAST SAINT JULIAN STREET
SAVANNAH, GEORGIA 31401
POST OFFICE BOX 9848
SAVANNAH, GEORGIA 31412-0048

Date: July 6, 1998

1. COMMENT: Past harbor widening and deepening projects have already adversely impacted our client. The miscalculation of slope ratios associated with past projects has undermined and jeopardized the service road that fronts Blue Circle's property as well as other improvements on the property.

RESPONSE: We have no evidence of any direct impact to the Blue Circle property from any past or proposed harbor improvement project.

2. COMMENT: Unfortunately, the draft feasibility report and draft EIS does not adequately address all factors or impacts which may result from the proposed harbor expansion. The report acknowledges the necessary ship simulator study that will define the channel design and the location of various "harbor wideners" has not been conducted. Until these important studies are undertaken it is impossible to understand what impacts adjacent property owners may experience as a result of this project.

RESPONSE: The preliminary channel design serves as the basis for considering project impacts. Additional studies in the CED phase will be used to further refine the design and develop a final mitigation plan.

3. COMMENT: Blue Circle is certainly in favor a viable and active harbor. However, the deepening proposed by GPA and the Corps must be studied more thoroughly and all impacts ascertained beyond doubt prior to project approval. In short, it does little good to approve a project with the caveat that all impacts will be not ascertained until much later. Blue Circle and other property owners adjacent to the Savannah River must know what impacts the proposed project will have on their operations. At this time, those questions remain unanswered.

RESPONSE: GPA is encouraged that Blue Circle favors an active harbor. The studies conducted during the feasibility phase were based on professional judgement and available information. GPA believes those studies were conducted at a level of detail appropriate for the feasibility phase of a proposed project. The study documents disclose the effects that

those studies indicate are likely to occur if the proposed project is implemented. More detailed investigations of some project issues will be performed during the CED phase. Should significant refinements in the project design become necessary, affected interests would be notified.

4. COMMENT: Due to the unanswered questions associated with the harbor deepening project, Blue Circle requests the District Engineer schedule and conduct a public hearing so all impacts associated with the Savannah Harbor expansion can be adequately addressed.

RESPONSE: GPA has been meeting with individual groups and agencies during the Public Comment period, and plans to hold public information meetings and hearings during the CED phase as part of the preparation of the Tier II EIS.

5. COMMENT: Refer to Draft Feasibility Studies, Reports, Design Memorandums and Environmental Impact Statement of September 1985, September 1987 and September 1992. These have significantly more data to support concerns of the previous programs than the current Draft Environmental Impact Statement for the new deepening particularly in regards to in to technical issues or risks associated.

RESPONSE: GPA believes the studies conducted during the feasibility phase were performed at a level of detail appropriate for that phase of a proposed project. The study documents disclose the effects that those studies indicate are likely to occur if the proposed project is implemented. More detailed investigations of some project issues will be performed during the CED phase.

6. COMMENT: (A) Detailed, comprehensive slope stability analysis to determine risk to adjacent riverside structures including docks, wharfs, breasting and mooring dolphins, landside loading areas, etc.

RESPONSE: During the CED phase, a ship simulation study will be performed, and the channel alignment will be refined to minimize land acquisition and maintain the safe handling of the ships. A slope stability analysis will be performed in any new widener areas where the project side slopes are anticipated to impact adjacent land owners or structures.

7. COMMENT: (B) Effect on hydrology of the river due to reduction in velocity, sudden variations of velocities and eddying at now cross section changes at outsets, wideners, turning basin, modifications etc.

RESPONSE: Examination of model projected velocities pre- and post-project have shown that velocities due to the proposed deepening will decrease or remain unchanged throughout the system.

8. COMMENT: (C) Effect by modified river hydrology to additional or redistribution of sediment which will increase maintenance costs, operations and disruption by dredging

operations.

RESPONSE: The total average annual volume of maintenance material dredged from the project has not increased since completion of the last deepening project. What has occurred has been a shift in the location of the material within the project limits. This can be attributed more to closing the New Cut channel, which occurred prior to the deepening, than to the deepening project. Prior to closing New Cut, approximately 4.2 million CY of material were dredged from the navigation channel and approximately 4.0 million CY were removed from the sediment basin. Since closing New Cut, only approximately 2.4 million CY are removed from the sediment basin and the remainder of the material shoals in the navigation channel. Based on previous studies, the total average annual shoaling in Savannah Harbor for the last forty years has been approximately 7 million CY. An increase in the total shoaling resulting from the proposed expansion is not anticipated. We do, however, anticipate upstream shift in shoaling based on changes in the velocities and location of the salinity wedge.

9. COMMENT: (D) Effect on historical water level rises.

RESPONSE: The model results have been examined to quantify any increase in water level due to the proposed project deepening. The results do not show any significant increases in water level. The results of these analyses will be included within the final EIS.

10. COMMENT: (E) Effect on advance maintenance prisms.

RESPONSE: GPA believes the studies conducted during the feasibility phase were performed at a level of detail appropriate for that phase of a proposed project. The study documents disclose the effects that those studies indicate are likely to occur if the proposed project is implemented. More detailed investigations of some project issues will be performed during the CED phase.

11. COMMENT: (F) Fit of channel and wideners to a ship simulator model.

RESPONSE: The channel design in the feasibility report -- including the bendwideners -- followed Corps of Engineers design guidance, all existing information, and the use of professional engineering judgement. That design will be refined during the CED phase through the use of a ship simulator.

12. COMMENT: (G) Silt disposal areas. Present modifications will reduce volume of Disposal Area 2A.

RESPONSE: Concur.

13. COMMENT: (H) Revisit Corps of Engineers previous studies which showed drafts

of44' as intended limit in long range, 50 year forecasts. Now we are at 50'+. What happens with the next study? Tens of thousand of dollars were spent with the original studies and appears they were now in error.

RESPONSE: The Feasibility Study adequately addresses the changing nature of the Economic Analysis to support the construction of the Recommended Plan.

14. COMMENT: (I) Reduction in width of the Harbor at the -50' mlw level will force larger vessels requiring deeper drafts into the channel path threatening or disrupting two way traffic and impact safety. The 500' wide limit at the -42' mlw depth is minimal or less than required by reference design procedures. Privately owned bulkheads of TIC on Hutchinson Island were designed for increased depths of 4' beyond the projected at the time of construction. The new widener and unexpected depths of the channel have significant losses that were designed to address the earlier harbor forecasts.

RESPONSE: The deepened channel will not alter the practices the pilots currently use in bringing Panamax vessels into the harbor. Two way traffic for these vessels will not be restricted and vessels may meet and pass under conditions the pilots determine are safe. It is not possible to design a channel to accommodate two-way traffic for post-Panamax vessels with the development that exists on the banks of the river. Movement of vessels will require coordination when post-Panamax vessels are transiting the project.

15. COMMENT: (J) What are the effects on the renourishment program, wave energy attenuators, etc. at the Savannah Beach end of the channel?

RESPONSE: ATM prepared a Preliminary Coastal Erosion Study that evaluated the potential effects of the proposed project on beaches within 10 miles of the project. The report concluded that the project will have no significant impact on the adjacent beaches.

16. COMMENT: (K) What effects will deeper draft vessels have on passing "bow wave" generation during high tide traverse? Risk of "overtopping" walkways such as at the New Trade Center. etc,

RESPONSE: Studies of overtopping walkways along the Savannah River have not been conducted.

17. COMMENT: (L) What are the effects anticipated and the result of studies on the changes in the salt water wedge, limits, dissolved oxygen and silt loads within the various water columns along the river?

RESPONSE: The effects of the proposed project upon salinity and dissolved oxygen, and the effects of alterations upon environmental resources in the river are clearly presented within the EIS in chapter 4. The impacts to the sediment load analysis has been identified as part of the CED phase of the project.

18. COMMENT: (M) What are the effects of reducing the littoral tidal velocity and existing and expected eddying effects along shorelines at various insets, dockages and landing zones which entrap silt and result in unexpected fallout because of reduced velocities. Historically, maintenance of adequate velocities in the channel was a primary consideration to avoid localized, transient silt deposits that would lead to increases in the cost of Federal, State and private industries through maintenance dredging activity, the tedious issuance of maintenance permits, monitoring costs, etc., and the expensive testing now required.

RESPONSE: The issues of impacts to sediment loadings and potential changes in dredging requirements has not been deemed a natural resource issue. Modeling of impacts of the proposed project upon sediment loading to the Lower Savannah River has been scheduled under the CED phase.

19. COMMENT: (N) What tests have taken of materials proposed to be removed along wideners, etc. and is it any way harmful to the storage areas. Does it contain any hazardous or unsatisfactory materials?

RESPONSE: All of the proposed project bend wideners were sampled as part of the dredged material environmental effects evaluation that supported the EIS and specifically the Section 404(b)(1) and Section 103 Evaluations that are required EIS attachments. A report prepared by ATM and available from the USACE details the results of the sediment and water sampling and analysis and the potential effects on the water column, benthic organisms, and terrestrial wildlife. The report did not find any contamination in the wideners that will likely create an unacceptable adverse condition on the area biotic communities. Further work is being conducted to provide assurances of these conclusions. Specifically, the GPA, USACE, and USEPA are developing a sampling and analysis effort to better quantify the potential effects of tributyltin on the aquatic and terrestrial environment and a more rigorous evaluation of bioaccumulative contaminants of concern will be undertaken to assess the risk of these organic compounds to avian wildlife using the Harbor CDF system as foraging habitat.

Independent Freight Forwarders and Customs Brokers Association
of Savannah, Inc.
POST OFFICE BOX 1465
SAVANNAH, GEORGIA 31402

July 07, 1998

Mr. William Bailey
U.S. Army Corps of Engineers
Planning Division
Environmental Research Branch
P.0. Box 889
100 W. Oglethorpe Avenue
Savannah, GA 31402

Dear Mr. Bailey:

I am writing to you on behalf of the Independent Freight Forwarders and Customs Brokers Association of Savannah. We handle logistics and documentation for exports and imports thru the Port of Savannah. We writing in support of the proposed Savannah Harbor Deepening Project. In recent years, the ships utilizing the Port of Savannah have grown far beyond levels previously predicted. Specifically, Savannah is seeing the large containerships today that were previously not projected to call the port for another twenty years. As a result of this growth in vessel size, the Savannah River Navigation Channel is not capable of adequately accommodating many of the ships now calling on the port. This inadequacy in channel depth forced over 52% of container ships serving the port of Savannah in 1996 to ether load to less than capacity (light-load) or wait until high tide to transit the channel. Such operational constraints lead to dramatic increases in transportation costs which are subsequently passed on to consumers and can ultimately force port users to seek more readily accessible facilities. Furthermore, as the world marketplace continues to grow, so too will these larger ships.

According to the Savannah Harbor Deepening Feasibility Study Report, significant changes will occur in the fleet of vessels utilizing the Port of Savannah and the current 42 mean low water channel depth will become increasingly inadequate. According to Tables 5-7, 5-8,and 5-9 of that report:

1. Calls by vessels of less than 38 feet of design draft will increase by over 640 percent.
2. Deep draft vessel (those drafting more than 38 feet) calls will increase by over 445 percent.
3. The first Post-Panamax II vessel will call Savannah within the next decade if the channel is deepened to 46 feet in depth or greater.

4. Post-Panamax vessels will not be placed in Savannah-calling rotations unless the channel is greater than 44 feet in depth or vessels are operated light-loaded (greater or equal to seven feet).
5. Overall vessel calls will increase by over 530 percent. averaging almost 4 percent per year.

These predictions clearly show the increased demands that will be placed on the Port of Savannah and the capabilities necessary to accommodate those demands.

Failure to meet the requirements of vessels utilizing the Port of Savannah now and into the future will pose serious economic implications to our shipping industry. To insure that the current success and future growth opportunities of Georgia's shipping industry are preserved, we urge the U.S. Army Corps of Engineers and the Congress to move for immediate authorization of the Savannah Harbor Deepening Project via the Water Resource Development Act of 1998.

Sincerely,

Janet B. Fields
Legislative Committee
Chairman

cc: Senator Paul Coverdell
Senator Max Cleland
Congressman Jack Kingston
Anna Arnsdorff, President IFFCHB

Letter response

Independent Freight Forwarders
and Customs Brokers Association
of Savannah, Inc.
Post Office Box 1465
Savannah, Georgia 31402

Date: July 07, 1998

1. **COMMENT:** We support the proposed Savannah Harbor Deepening Project.

RESPONSE: No response necessary.

2. **COMMENT:** In recent years, the ships using the Port of Savannah have grown far beyond levels previously predicted. Specifically, Savannah is seeing the large containerships today that were previously not projected to call the port for another twenty years. As a result of this growth in vessel size, the Navigation Channel is not capable of adequately accommodating many of the ships now calling on the port. This inadequacy in channel depth forced over 52% of container ships serving the port in 1996 to ether load to less than capacity (light-load) or wait until high tide to transit the channel. Such operational constraints lead to dramatic increases in transportation costs that are subsequently passed on to consumers and can ultimately force port users to seek more readily accessible facilities. Furthermore, as the world marketplace continues to grow, so too will these larger ships.

RESPONSE: Concur.

3. **COMMENT:** According to the Feasibility Study Report, significant changes will occur in the fleet of vessels using the Port of Savannah and the current 42 MLW channel depth will become increasingly inadequate. According to Tables 5-7, 5-8,and 5-9 of that report:

1. Calls by vessels of less than 38 feet of design draft will increase by over 640 percent.
2. Deep draft vessel (those drafting more than 38 feet) calls will increase by over 445 percent.
3. The first Post-Panamax II vessel will call Savannah within the next decade if the channel is deepened to 46 feet in depth or greater.

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5. Overall vessel calls will increase by over 530 percent. averaging almost 4 percent per year.

These predictions clearly show the increased demands that will be placed on the Port of Savannah and the capabilities necessary to accommodate those demands. Failure to meet the requirements of vessels using the Port of Savannah now and into the future will pose serious economic implications to our shipping industry. To insure that the current success and future growth opportunities of Georgia's shipping industry are preserved, we urge the Corps and Congress to move for immediate authorization of this Project via the WRDA of 1998.

RESPONSE: The feasibility studies show the proposed project is economically justified and would benefit the State of Georgia and the Nation.

Internation Lonsshoremen's Association (Local 1414)

International Longshoremen's Association

Affiliated with AFL-CLO and Canadian Labour Congress
LOCAL NO. 1414
221 N - E. Lathrop Avenue - Post Office Box 1262
Savannah, Georgia 31402
Telephones 233-2944 - 232-8242 - Fax 236-8081

Eddie McBride, Jr., President
Benjamin S. Bryan, Secretary

June 18, 1998

Mr. William Bailey
U. S. Army Corps of Engineers
Post Office Box 889
100 West Oglethorpe Avenue
Savannah, Georgia 31402

Dear Mr. Bailey:

We are writing on behalf of the members of The International Longshoremen's Association (ELA) Local 1414 in Savannah, Georgia. We are also writing in support of the Savannah Harbor Deepening Project as identified in the Corps of Engineer's Draft Environmental Impact Study and Feasibility Study Report.

We would like to stress to you the importance of supporting this project not only for the benefit of Longshoremen in Savannah, but also for the State of Georgia. Georgians are the true benefactors of our work on the docks and the Port of Savannah will lose work as well as revenue not only to our closest competitors like Jacksonville, Florida, and Charleston, South Carolina but to other Ports in the South Atlantic District.

According to the 1997 Economic Impact Study, Georgia Ports Terminals have an annual economic impact of jobs and salaries ranging from 80,l00.00 to l.8 billion dollars. The revenue reported for this period was about 23 billion dollars and taxes were 585 million dollars. In order for this project to continue, we must achieve Federal authorization via the Resource Development Act of 1998 (WRDA98).

Tables 5-7, 5-8 and 5-9 of the Feasibility Study Report further predicts:

1. Calls by vessels of less than 38 feet of design draft will increase by more than 640 percent.

2. There will be an increase in deep draft vessel calls by more than 445 percent.

3. The first post-panamax 11 vessel will call on the Port of Savannah within the next decade if the channel is deepened to a depth of 46 feet or greater.

4. Post-panamax vessel will not be placed in the Savannah calling rotation unless the channel is greater than 44 feet in depth or the vessels are operated light-loaded (greater or equal to seven feet).

5. Overall vessel calls will increase by more than 530 percent, averaging almost 4 percent per year.

This project is considered a necessity for the Port of Savannah with regards to the maintenance of an adequate navigational channel. If this project is not considered, it could pose serious economic consequences that may be detrimental to the employment of Georgians and revenue for the populous.

Again, we strongly urge you to continue this project without further delay.

Cordially,

Eddie McBride, Jr., President
ILA Local 1414

Moses Trappio, 111, Vice
President - ILA Local 1414

Secretary / Treasurer

ILA Local 1414

EM, jr / MT,iii / GE / fps

cc: The Honorable Jack Kingston, United State Congress
The Honorable Max Cleland, United States Senate
The Honorable Paul Coverdell, United States Senate
The Honorable Sanford Bishop, United States Congress
The Honorable Cynthia McKinney, United States Congress
The Honorable John Lewis, United States Congress
The Honorable Michael "Mac" Collins, United States Congress The Honorable Bob Barr, United States Congress
The Honorable Saxby Chambliss, United States Congress
The Honorable John Linder United States Congress
The Honorable Nathan Deal, United States Congress
The Honorable Newt Gingrich, United States Congress
The Honorable Charles Norwood, United States Congress
Mr. Ed Eudaley, United States Fish & Wildlife Service
Mr. James McCurry, Legislative Affairs - GPA

Letter response

International Longshoremen's Association

Affiliated with AFL-CLO and Canadian Labour Congress
LOCAL NO. 1414
221 N - E. Lathrop Avenue - Post Office Box 1262
Savannah, Georgia 31402

June 18, 1998

1. COMMENT: The International Longshoremen's Association (ELA) Local 1414 in Savannah, Georgia supports the Savannah Harbor Deepening Project as identified in the Corps of Engineer's DEIS and Feasibility Study Report.

RESPONSE: No response necessary.

2. COMMENT: We would like to stress the importance of supporting this project not only for the benefit of Longshoremen in Savannah, but also for the State of Georgia. Georgians are the true benefactors of our work on the docks and the Port of Savannah will lose work as well as revenue not only to our closest competitors like Jacksonville, Florida, and Charleston, South Carolina but to other Ports in the South Atlantic District.

RESPONSE: No response necessary.

3. COMMENT: According to the 1997 Economic Impact Study, Georgia Ports Terminals have an annual economic impact of jobs and salaries ranging from 80,l00.00 to l.8 billion dollars. The revenue reported for this period was about 23 billion dollars and taxes were 585 million dollars. In order for this project to continue, we must achieve Federal authorization via the Resource Development Act of 1998 (WRDA98). Tables 5-7, 5-8 and 5-9 of the Feasibility Study Report further predicts:

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5. Overall vessel calls will increase by more than 530 percent, averaging almost 4 percent per year.

RESPONSE: No response necessary.

4. COMMENT: This project is considered a necessity for the Port of Savannah with regards to the maintenance of an adequate navigational channel. If this project is not considered, it could pose serious economic consequences that may be detrimental to the employment of Georgians and revenue for the populous.

RESPONSE: No response necessary.

International Longshoremen's Association (1475)

International Longshoremen's Association
Affiliated with AFL-CIO and Canadian Labour Congress
LOCAL No. 1475
24 Drayton Street, Suite 710 - Post Office Box 1325
Savannah, Georgia 31402 - Telephone 912-238-1475

Anthony K. Balcom, President
Donnie Bell, Vice President
John P Buttimer, Treasure
Homer C. Jenkins III, Business Agent
Marvin C. Jenkins, Recording

June 19, 1998

Mr. William Bailey
P.0. Box 889
100 W. Oglethorpe Ave.
Savannah, Georgia 31402

RE: Savannah Harbor Expansion

Dear Sir,

My name is Anthony Kurt Balcom and I am the President of the International Longshoreman Association Local 1475 Clerks and Checkers in Savannah Georgia. I writing this letter in strong support of the Savannah Harbor Expansion (DEEPENING). As you may know, the cite of our city was chosen by General OGLETHORPE for a variety of reasons, not the least of which was its proximity to a river that would give rise to a healthy commerce to support the new colony. Since that time numerous key industries have grown and prospered along the Savannah River. The economic impact of the Savannah River not only effects Savannah and Chatham County, but the entire State of Georgia reaps the benefits.

The South Atlantic Region of the United States is one of the fastest growing regions in the entire country. Trade forecasters are predicting enormous growth in containerized cargo. The South Atlantic containerized export growth forecast averages greater than 5.5 percent annually over the 2000 to 2050 study period while imports of containerized goods are forecast to increase at an average annual rate of 3.9 percent over the same period. The best way to assure this growth forecast becomes a reality is to stay competitive with neighbors to the north and south. The best way to stay competitive with our neighbors is to have a channel deep enough to accommodate the larger vessels of the future.

The shipping industry continues to get bigger and bigger, and the size of the vessels moving cargo in and out of our country continues to get larger and larger. Over half of the containerships calling Savannah were draft constrained in 1996. Current and future carriers calling the port of Savannah will have vessels needing more draft. The number of vessels calling the port of Savannah will ultimately depend upon the depth of our river. If Savannah cannot provide adequate draft for the vessels of the future the carriers will look and call upon our neighbors to the north and south.

The economic growth of the entire State of Georgia depends upon the Savannah River. The economic lifeblood of this region has been linked to our free access to the sea and to foreign markets. The Savannah River provides a means to export all of Georgia's goods to the global economy. The economic impact is not only beneficial to Savannahians, but all Georgians benefit.

The Savannah River generates an estimated eighty thousand plus jobs throughout the state. The wages earned in connection with those jobs is almost two billion dollars for all Georgians. The tax dollars collected in connection with those jobs is five hundred eighty-five million dollars, The total revenue for work generated by the Savannah River is twenty three billion dollars. The facts tell true story concerning the importance of the Savannah River to the State of Georgia. The most important fact to remember is without a deep enough channel to accommodate larger vessels Georgia will loose all of these assets.

In closing I would like to mention some facts concerning our environment. I was born and raised in Savannah Georgia. I remember when the Savannah River was a nasty, dirty, and polluted body of water. Industries along the river took advantage of the situation. The tide has changed and now the river is a productive asset for the City of Savannah and the State of Georgia. Today you see recreational boaters enjoying the river, fishermen once again catching fish, and environmentalist speaking out to protect the river. The fact is the environmentalist have done a swell job informing the public, and they have not allowed the river to regress to its once polluted state. I fell the concerns of certain groups is unfounded and the benefits of deepening the river out weigh these concerns. 'The port of Savannah must have a river deep enough to meet the needs of the next generation of shipping vessels. The recent construction of a new bridge has helped Savannah stay competitive within the stepping industry. What better way to complement the new bridge than with a deeper channel. I am sure if General Oglethorpe had a say in the Savannah Harbor Expansion he would vote to deepen the river to whatever depth necessary to keep Georgia competitive.

Thanks very much,

Anthony Kurt Balcom
President I.L.A. 1475

Letter response

International Longshoremen's Association

LOCAL No. 1475
24 Drayton Street, Suite 710 - Post Office Box 1325
Savannah, Georgia 31402 - Telephone 912-238-1475

June 19, 1998

1. **COMMENT:** The International Longshoreman Association Local 1475 is in strong support of the Savannah Harbor Expansion (DEEPENING). As you may know, the cite of our city was chosen by General OGLETHORPE for a variety of reasons, not the least of which was its proximity to a river that would give rise to a healthy commerce to support the new colony. Since that time numerous key industries have grown and prospered along the Savannah River. The economic impact of the Savannah River not only effects Savannah and Chatham County, but the entire State of Georgia reaps the benefits.

RESPONSE: No response necessary.

2. **COMMENT:** The South Atlantic Region of the United States is one of the fastest growing regions in the entire country. Trade forecasters are predicting enormous growth in containerized cargo. The South Atlantic containerized export growth forecast averages greater than 5.5 percent annually over the 2000 to 2050 study period while imports of containerized goods are forecast to increase at an average annual rate of 3.9 percent over the same period. The best way to assure this growth forecast becomes a reality is to stay competitive with neighbors to the north and south. The best way to stay competitive with our neighbors is to have a channel deep enough to accommodate the larger vessels of the future.

RESPONSE: No response necessary.

3. **COMMENT:** The shipping industry continues to get bigger and bigger, and the size of the vessels moving cargo in and out of our country continues to get larger and larger. Over half of the containerships calling Savannah were draft constrained in 1996. Current and future carriers calling the port of Savannah will have vessels needing more draft. The number of vessels calling the port of Savannah will ultimately depend upon the depth of our river. If Savannah cannot provide adequate draft for the vessels of the future the carriers will look and call upon our neighbors to the north and south.

RESPONSE: No response necessary.

4. **COMMENT:** The economic growth of the entire State of Georgia depends upon the Savannah River. The economic lifeblood of this region has been linked to our free access to

the sea and to foreign markets. The Savannah River provides a means to export all of Georgia's goods to the global economy. The economic impact is not only beneficial to Savannahians, but all Georgians benefit.

RESPONSE: No response necessary.

5. COMMENT: The Savannah River generates an estimated eighty thousand plus jobs throughout the state. The wages earned in connection with those jobs is almost two billion dollars for all Georgians. The tax dollars collected in connection with those jobs is five hundred eighty-five million dollars. The total revenue for work generated by the Savannah River is twenty three billion dollars. The facts tell true story concerning the importance of the Savannah River to the State of Georgia. The most important fact to remember is without a deep enough channel to accommodate larger vessels Georgia will lose all of these assets.

RESPONSE: No response necessary.

6. COMMENT: In closing I would like to mention some facts concerning our environment. I was born and raised in Savannah Georgia. I remember when the Savannah River was a nasty, dirty, and polluted body of water. Industries along the river took advantage of the situation. The tide has changed and now the river is a productive asset for the City of Savannah and the State of Georgia. Today you see recreational boaters enjoying the river, fishermen once again catching fish, and environmentalist speaking out to protect the river. The fact is the environmentalists have done a swell job informing the public, and they have not allowed the river to regress to its once polluted state. I feel the concerns of certain groups are unfounded and the benefits of deepening the river out weigh these concerns. The port of Savannah must have a river deep enough to meet the needs of the next generation of shipping vessels. The recent construction of a new bridge has helped Savannah stay competitive within the stepping industry. What better way to complement the new bridge than with a deeper channel. I am sure if General Oglethorpe had a say in the Savannah Harbor Expansion he would vote to deepen the river to whatever depth necessary to keep Georgia competitive.

RESPONSE: No response necessary.

Kemira Pigments, Inc. (Robert J. Scanlon)

KEMIRA
KEMIRA PIGMENTS INC.

July 7, 1998

Mr. William Bailey
United States Army Corps of Engineers
Savannah District
Environmental Resources Branch
P.O. Box 889
100 West Oglethorpe Avenue
Savannah, Georgia 31402

Re: April, 1998 Draft Environmental Impact Statement ("DEIS") for the Proposed Expansion of the Savannah Harbor

Dear Mr. Bailey:

We appreciate the opportunity to review the April, 1998 Draft Environmental Impact Statement (the "DEIS") and other materials related to the Georgia Ports Authority's ("GPN') and the United States Army Corps of Engineers' (the "Corps"'), (collectively the Sponsors), proposed expansion of the Savannah Harbor (the Project"), and offer the following comments.

1. Project Summary

The Sponsors propose to expand the existing navigation facilities at Savannah Harbor, located in Chatham County, Georgia and Jasper County, South Carolina, by deepening the channel to the ocean from 2 to 8 feet. The Sponsors have indicated that their preferred alternative involves a deepening of 8 feet, for a total channel depth of 50 feet. The DEIS indicates that any deepening of the channel would have significant impacts on, among other things, the levels of both salinity and dissolved oxygen ("DO") present in affected areas of the Savannah River, and that the project could lead to increased erosion of the river banks. Provided that the Project includes measures to fully mitigate for any decline in dissolved oxygen in the River, any increase in salinity at the City of Savannah's I & D Raw Water intake, and address local river bank erosion issues, Kemira supports the proposal to deepen the Harbor Channel.

Kemira Pigments, Inc.

MAILING ADDRESS	STREET ADDRESS	TELEPHONE
P 0 Box 368	One Kemira Road	(912) 652-1000
Savannah GA 31402	Savannah, GA 31404	

2. Comments Summary

As presented the Project will lower concentrations of DO in affected areas of the Savannah River to concentrations below those permissible under Georgia law. GPA has recently indicated that they will include mitigation designed to maintain DO levels at pre-project levels. If GPA fails to include the mitigation in the Project, the Project's reduction of DO concentrations violates anti-degradation principles central to Georgia's, South Carolina's, and federal regulatory schemes designed to protect water quality. Absent the mitigation, the Project's alteration of DO concentrations will also have a negative impact on the shortnose sturgeon, a species of fish listed as endangered under the Endangered Species Act ("ESA"), 16 U.S.C. SS 1531 et seq. (1998). The cost of these mitigation projects must be included in both the project Authorization and in the Appropriation Bill submitted to Congress.

3. State and Federal Laws Implicated by the DEIS

A. State DO Criteria

The DEIS predicts that the Project will reduce concentrations of DO present in affected areas of the Savannah River in an amount up to 1 mg/L (DEIS, S 5, at 48). Unless the impact of this reduction in DO concentration is mitigated, the Project may cause the affected areas of the Savannah River to drop below the minimum DO concentrations established by the State of Georgia.

B. State and Federal Anti-Degradation Principles

If mitigation is not included in this Project, it will be in violation of South Carolina Pollution Control Act, S,C. Code Ann. 48-1-10 et seq. (1998), and of the Federal Water Pollution Control Act (the "Clean Water Act" or "CWN'), 33 U.S.C. 1251 et seq. (1998).

C. Endangered Species Act

Mitigation for the projected reduction in DO must be timed to assure that the population of the endangered species, shortnose sturgeon, Acipenser brevirostrum, is not impacted. The sturgeon-related mitigation measures detailed in the DEIS are inadequate to ensure that the purposes and goals of the ESA are achieved.

D. The Sponsor's Letter response of the Project does not Comply with NEPA

NEPA requires that agencies of the federal government include in proposals for "major Federal actions significantly affecting the quality of the human environment a detailed statement" of, among other things: (1) the environmental impact of the proposed action- (2) any adverse environmental effects which cannot be avoided should the proposal be implemented; and (3) alternatives to the proposed action. 42 U.S.C.

4332(C)(i)-(iii). Such agencies must also "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." Id. 4332(E).

The April, 1998 DEIS prepared by the Sponsor is insufficient for purposes of NEPA because, among other things,

(1) the Sponsor fails to adequately discuss the environmental impacts of dredging to depths other than to the Sponsor's recommended 50-foot depth;

(2) the Sponsor fails to identify any adverse environmental effects which cannot be avoided should the proposal be implemented, or which could be avoided through dredging to depths other than to 50 feet;

(3) the Sponsor fails to state that its recommended alternative will, in all likelihood, violate the law of the State of Georgia;

(4) the Sponsor fails to discuss DO or salinity concentrations at depths other than 50 feet;

(5) the Sponsor does not adequately discuss the impacts of the Project on the shortnose sturgeon and striped bass;

(6) the Sponsor has not conducted any studies of alternatives to its recommended 50-foot dredging depth which might resolve conflicts related to the existing, competing uses of the natural resources of the Savannah River-,

(7) the Sponsor has failed to consider any mitigation measures related to the projected increase in salinity and decrease in DO for any of the alternatives;

(8) flaws in the Sponsor's Hydrodynamic Model prevent the Sponsor from providing an accurate statement concerning the Project's environmental impacts;

(9) given the Project's scope and complexity, the Sponsor has failed to provide sufficient time for the public to comment on the DEIS; and

(10) given the Project's scope, complexity, and significant environmental impacts, the Sponsor as a general matter has not conducted sufficient information gathering for its DEIS to meet NEPA's "detailed statement" requirement.

4. Salinity

A. Impact on the City of Savannah's I & D water system

Kemira Pigments Inc. is dependent upon the City of Savannah's I & D water system for water for its manufacturing process. The quality criteria for this process, particularly with regard to concentrations of ions such as chlorides, are significantly tighter than the drinking water standards referenced in the Project. The City's I & D water treatment facility currently has no ability to control chloride ion concentration, they, (we), are dependent upon the quality of the raw water entering the treatment plant. Any increase in chlorides in the I & D water will result in significant cost increases for Kemira and the other industries dependent upon this water supply. The Harbor deepening Project must include provisions to mitigate any reduction in water quality available to the City's I & D facility. The proposal of GPA to relocate the raw water intake if the chloride concentration exceeds EPA's drinking water standards is not acceptable. The EPA Drinking Water Standard allows 250 ppm chlorides, The City of Savannah is committed to supply water with an average of 10 ppm chlorides. An increase in chlorides of this magnitude would have a multi-million dollar impact upon each of the critical industries.

5. River Bank Stability

A. Concern for the stability of the historic Fort Jackson

The DEIS at Sec. 13.2 indicates concern for the stability of Fort Jackson with a proposal to construct a submerged sheet pile retaining wall for a distance above and below the fort. Kemira urges the Sponsors to conduct "Ship Simulator" testing to determine if the proposed project will impact the stability of Kemira's river banks both above and below Fort Jackson. Should the simulator studies or actual experience indicate that the Project has negatively impacted Kemira's property, or use thereof, the Project is expected to provide mitigation for this impact.

Kemira Pigments, Inc. endorses to comments submitted by the Harbor Committee of the Manufacturers Council of the Savannah Area Chamber of Commerce, and incorporates them by reference into these comments.

Kemira Pigments is supportive of the proposed project and is willing to continue to work with the Corps and Georgia Ports Authority to develop reasonable alternatives and mitigation measures which will not result in a shift of the costs of maintaining the Savannah Harbor as a multi-use estuary. We urge the Corps and Georgia Ports Authority to explore such alternatives and measures and to include them in the Project. Once incorporated into the Project, the Corps' proposed dredging of the Savannah River can enjoy the support of all of the members of the Savannah community.

Thank you again for the opportunity to comment on the April, 1998 Draft Environmental Impact Statement and related materials pertaining to the proposed dredging of the Savannah Harbor. Please do not hesitate to give me a call if you have any questions.

Very truly yours,

Robert J. Scanlon
Vice President Corporate Affairs

cc: Norm Christensen, President Kemira Pigments, Inc.
Charles Perry, Esq. Hunton & Williams
Amy Hughes, Savannah Chamber of Commerce

Letter response

KEMIRA
KEMIRA PIGMENTS INC.
P0 Box 368
Savannah GA 31402
One Kemira Road
Savannah, GA 31404

Date: July 7, 1998

1. COMMENT: Project Summary: The DEIS indicates that any deepening of the channel would have significant impacts on, among other things, the levels of both salinity and DO present in affected areas of the Savannah River, and that the project could lead to increased erosion of the river banks. Provided that the Project includes measures to fully mitigate for any decline in dissolved oxygen in the River, any increase in salinity at the City of Savannah's I & D Raw Water intake, and address local river bank erosion issues, Kemira supports the proposal to deepen the Harbor Channel.

RESPONSE: Under the CED phase of the project mitigation for any impacts to dissolved oxygen and any impacts of increased chloride levels at the City of Savannah Raw Water Intake is to be designed. The mitigation options will be evaluated and presented within the Tier II EIS.

2. COMMENT: Comments Summary: As presented, the Project will lower concentrations of DO in affected areas of the Savannah River to concentrations below those permissible under Georgia law. GPA has recently indicated that they will include mitigation designed to maintain DO levels at pre-project levels. If GPA fails to include the mitigation in the Project, the Project's reduction of DO concentrations violates anti-degradation principles central to Georgia's, South Carolina's, and federal regulatory schemes designed to protect water quality. Absent the mitigation, the Project's alteration of DO concentrations will also have a negative impact on the shortnose sturgeon, a species of fish listed as endangered under the Endangered Species Act ("ESA"). The cost of these mitigation projects must be included in both the project authorization and in the Appropriation Bill submitted to Congress.

RESPONSE: The EIS has been revised to provide mitigation of project impacts on dissolved oxygen levels in the Savannah Harbor. The estimated costs of mitigation have been included in the project costs.

3. COMMENT: State and Federal Laws Implicated by the DEIS -- State DO Criteria: The DEIS predicts that the Project will reduce concentrations of DO present in affected areas

of the Savannah River in an amount up to 1 mg/L. Unless the impact of this reduction in DO concentration is mitigated, the Project may cause the affected areas of the Savannah River to drop below the minimum DO concentrations established by the State of Georgia.

RESPONSE: The EIS has been revised to provide mitigation of project impacts on dissolved oxygen levels in the Savannah Harbor. The estimated costs of mitigation have been included in the project costs.

4. COMMENT: State and Federal Anti-Degradation Principles: If mitigation is not included in this Project, it will be in violation of both South Carolina Pollution Control Act and the Federal Water Pollution Control Act (the "Clean Water Act").

RESPONSE: The EIS has been revised to provide mitigation of project impacts on dissolved oxygen levels in the Savannah Harbor. The estimated costs of mitigation have been included in the project costs.

5. COMMENT: Endangered Species Act: Mitigation for the projected reduction in DO must be timed to assure that the population of the endangered species, shortnose sturgeon, Acipenser brevirostrum, is not impacted. The sturgeon-related mitigation measures detailed in the DEIS are inadequate to ensure that the purposes and goals of the ESA are achieved.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

6. COMMENT: The Sponsor's discussion of the project does not comply with NEPA: NEPA requires that agencies of the federal government include in proposals for "major Federal actions significantly affecting the quality of the human environment a detailed statement" of, among other things: (1) the environmental impact of the proposed action- (2) any adverse environmental effects which cannot be avoided should the proposal be implemented; and (3) alternatives to the proposed action. Such agencies must also "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources. The DEIS prepared by the Sponsor is insufficient for purposes of NEPA because, among other things,

(1) the Sponsor fails to adequately discuss the environmental impacts of dredging to depths other than to the Sponsor's recommended 50-foot depth;

(2) the Sponsor fails to identify any adverse environmental effects which cannot be avoided should the proposal be implemented, or which could be avoided through dredging to depths other than to 50 feet;

(3) the Sponsor fails to state that its recommended alternative will, in all likelihood, violate the law of the State of Georgia;

(4) the Sponsor fails to discuss DO or salinity concentrations at depths other than

50 feet;

(5) the Sponsor does not adequately discuss the impacts of the Project on the shortnose sturgeon and striped bass;

(6) the Sponsor has not conducted any studies of alternatives to its recommended 50-foot dredging depth which might resolve conflicts related to the existing, competing uses of the natural resources of the Savannah River-,

(7) the Sponsor has failed to consider any mitigation measures related to the projected increase in salinity and decrease in DO for any of the alternatives;

(8) flaws in the Sponsor's Hydrodynamic Model prevent the Sponsor from providing an accurate statement concerning the Project's environmental impacts;

(9) given the Project's scope and complexity, the Sponsor has failed to provide sufficient time for the public to comment on the DEIS; and

(10) given the Project's scope, complexity, and significant environmental impacts, the Sponsor as a general matter has not conducted sufficient information gathering for its DEIS to meet NEPA's "detailed statement" requirement.

RESPONSE: The EIS is considered adequate for determining the feasibility of the proposed action. In addition, the EIS will be revised to include a process for performing additional studies which will further address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

7 COMMENT: Salinity and its impact on the City's I & D water system: Kemira is dependent upon the City's I & D water system for water for its manufacturing process. The quality criteria for this process, particularly with regard to concentrations of ions such as chlorides, are significantly tighter than the drinking water standards referenced in the Project. The City's water treatment facility currently has no ability to control chloride ion concentration, they (we), are dependent upon the quality of the raw water entering the treatment plant. Any increase in chlorides in the I & D water will result in significant cost increases for Kemira and the other industries dependent upon this water supply. The Project must include provisions to mitigate any reduction in water quality available to the City's I & D facility. The proposal of GPA to relocate the raw water intake if the chloride concentration exceeds EPA's drinking water standards is not acceptable. The EPA Drinking Water Standard allows 250 ppm chlorides, The City is committed to supply water with an average of 10 ppm chlorides. An increase in chlorides of this magnitude would have a multi-million dollar impact upon each of the critical industries.

RESPONSE: A plan of study has been proposed and presented to the City of Savannah to quantify any increases in the chloride concentration at their raw water intake due to the proposed deepening project. This Plan of Study is presently under review by the City of Savannah. This study is to be implemented during the CED phase of the project and the results of this study will be presented in the Tier II EIS and a separate stand alone report. This work will be completed during the CED phase of the project. Mitigation for any impacts will not be based upon exceedance of drinking water standards (250 mg/L) but will be based upon the net increase and any additional economic impacts to the City and those whom the City supplies water.

8. COMMENT: River Bank Stability -- Concern for the stability of the historic Fort Jackson: The DEIS at Sec. 13.2 addresses concern for the stability of Fort Jackson with a proposal to construct a submerged sheet pile retaining wall for a distance above and below the fort. Kemira urges the Sponsors to conduct "Ship Simulator" testing to determine if the proposed project will impact the stability of Kemira's riverbanks both above and below Fort Jackson. Should the simulator studies or actual experience indicate that the Project has negatively impacted Kemira's property, or use thereof, the Project is expected to provide mitigation for this impact.

RESPONSE: The hydrodynamic model does not indicate any measurable increase in water velocity in the area of Kemira's concern. If the ship simulator studies indicate the need to relocate the channel closer to the south bank, the potential effects on the shoreline will be reevaluated.

9. COMMENT: Kemira Pigments, Inc. endorses to comments submitted by the Harbor Committee of the Manufacturers Council of the Savannah Area Chamber of Commerce, and incorporates them by reference into these comments.

RESPONSE: Those comments are addressed under those submitted by the Chamber of Commerce.

10. COMMENT: Kemira Pigments is supportive of the proposed project and is willing to continue to work with the Corps and GPA to develop reasonable alternatives and mitigation measures which will not result in a shift of the costs of maintaining the Savannah Harbor as a multi-use estuary. We urge the Corps and GPA to explore such alternatives and measures and to include them in the Project. Once incorporated into the Project, the Corps' proposed dredging of the Savannah River can enjoy the support of all of the members of the Savannah community.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

Ofeechee Audubon Society

Ogeechee Audubon Society
P.O. Box 13806
Savannah, GA 31416-0806

June 17, 1998

William G. Bailey,
U.S. Army Corps of Engineers,
P.0. Box 889
Savannah, GA 31402-0889.

Dear Mr. Bailey:

Harbor Deepening Project

The Ogeechee Audubon Society (OAS), with 400 members, wishes to place on record its strong opposition to the Savannah River Harbor Deepening Project as currently defined.

In particular, OAS is concerned about the future of the Savannah National Wildlife Refuge (SNWR) which, despite initial assurances, has not recovered from the last widening project and the effects of the tidal gate fiasco. Sport and commercial fishing has suffered a sharp decline. The SNWR comprises 5% of the tidal freshwater marshes of the whole Atlantic seaboard (and 25% of these marshes in Georgia and South Carolina). The further intrusion of salt water will result in the slow death of the Refuge. The diversity of birds (over 200 species) relying on this unique ecological system must not be ignored. It is an important stop for many freshwater-dependent species on the Atlantic flyway.

The concerns of the Coastal Heritage Society concerning the integrity of Fort Jackson have been recognized with a $14 million mitigation plan (although this is considered by CHS to be inadequate). However no amount of financial mitigation would ever defend the SNWR.

Under the circumstances, OAS requests that a public meeting be convened so that the various concerns can be discussed openly; additionally, the comment period must be extended. There are many separate commercial, taxpayer, historical, and environmental aspects to be considered. In particular, the projected benefit to the community must be fully discussed.

Sincerely,
John R.H. Stafford
Vice-President, Ogeechee Audubon Society

cc:
Governor Zell Miller
Lieutenant Governor Pierre Howard
Senator Paul Coverdell
Senator Max Cleland
Congressman Jack Kingston
Lonice Barrett, Ga DNR
Harold Reheis, Ga DNR, EPD

Letter response

Ogeechee Audubon Society

P.O. Box 13806
Savannah, GA 31416-0806

June 17, 1998

1. COMMENT: The Ogeechee Audubon Society (OAS), with 400 members, wishes to place on record its strong opposition to the Savannah River Harbor Deepening Project as currently defined.

RESPONSE: No response necessary.

2. COMMENT: In particular, OAS is concerned about the future of the SNWR which, despite initial assurances, has not recovered from the last widening project and the effects of the Tidegate.

RESPONSE: Investigations performed by ATM as part of this study documented the reduction in salinity levels in Back River upstream of the Tidegate after operation of that structure ceased. Studies performed by the USFWS for Savannah District indicated that the tidal marsh is recovering in response to that decrease in salinity.

3. COMMENT: In particular, OAS is concerned about the future of the SNWR. Sport and commercial fishing has suffered a sharp decline. The SNWR comprises 5% of the tidal freshwater marshes of the whole Atlantic seaboard (and 25% of these marshes in Georgia and South Carolina). The further intrusion of salt water will result in the slow death of the Refuge. The diversity of birds (over 200 species) relying on this unique ecological system must not be ignored. It is an important stop for many freshwater-dependent species on the Atlantic flyway. No amount of financial mitigation would ever defend the SNWR.

RESPONSE: GPA recognizes the importance of the SNWR and directed much of the environmental efforts of the feasibility study toward identifying any potential adverse impacts that could result to the Refuge from implementation of the proposed project. The 3-D hydrodynamic and water quality model developed as part of this effort is a state-of-the-art tool that allows quantification of potential impacts. Methods to reduce potential adverse impacts to the Refuge were a large focus of the study. Wetland losses at the Refuge would total only 1.2 acres. Other wetlands would be converted from tidal brackish or freshwater marsh to saline or brackish marsh. The mitigation plan that is included in the project to compensate for those conversions and direct losses would greatly expand the acreage of wetlands that would be under management control of the SNWR. That would allow the USFWS to manage for wildlife purposes a much larger portion of the upper Savannah River estuary.

4. COMMENT: The concerns of the Coastal Heritage Society concerning the integrity of Fort Jackson have been recognized with a $14 million mitigation plan (although this is considered by CHS to be inadequate).

RESPONSE: The proposed project was revised in the final study documents to include sheet pile protection of the entire length of the fort structure along the river shoreline.

5. COMMENT: Under the circumstances, OAS requests that a public meeting be convened so that the various concerns can be discussed openly. There are many separate commercial, taxpayer, historical, and environmental aspects to be considered. In particular, the projected benefit to the community must be fully discussed.

RESPONSE: GPA has been meeting with individual groups and agencies during the Public Comment period, and plans to hold public information meetings and hearings during the CED phase as part of the preparation of the Tier II EIS.

6. COMMENT: The comment period must be extended.

RESPONSE: Savannah District extended the public comment period until July 7, 1998 to allow additional time for interested parties to make their views known.

Peeples Industries, Inc.

Peeples Industries, Inc.

The TransBridge Group
ConBulk Marine Terminals Group
TransIndustrial Development Group
TransContinental Agencies Group

June 19, 1998

Mr. William G. Bailey
U.S. Army Corps of Engineers, PD-E
Post Office Box 889
Savannah, GA 31402-0889

Re: GPA Savannah Harbor Expansion

Dear Mr. Bailey:

We are opposed to the GPA Expansion for the Savannah Harbor.

We are a financial holding company that owns and funds three separate marine terminal facilities at Savannah. These facilities have responded individually for with their own objections to the proposed further deepening of our harbor.

After reading the Georgia Ports Authority Savannah Harbor Expansion (deepening) study in its four parts, we object to the project on the grounds that the sponsor exhibits little or no evidence of high-level vessel operations or ownership experience, and appears to be relying heavily on perceived concerns and worries that Savannah may not be a viable commercial port unless this deepening project is hurriedly implemented.

Sincerely,

Frank K. Peeples
Chairman of the Board

Orlean Building 6001 Chatham Center Drive Suite 350 Savannah, GA 31405 P 0. Box 2253 Savannah, GA 31402
Tel. (912) 236-1865 Corp. Fax: (912) 238-5524 Forest Division Fax: (912) 235-4846

Letter response

Peeples Industries, Inc.

The TransBridge Group
ConBulk Marine Terminals Group
TransIndustrial Development Group
TransContinental Agencies Group
Orlean Building 6001 Chatham Center Drive Suite 350
Savannah, GA 31405
P.0. Box 2253 Savannah, GA 31402

June 19, 1998

1. COMMENT: We are opposed to the GPA Expansion for the Savannah Harbor.

RESPONSE: No response necessary.

2. COMMENT: We object to the project on the grounds that the sponsor exhibits little or no evidence of high-level vessel operations or ownership experience, and appears to be relying heavily on perceived concerns and worries that Savannah may not be a viable commercial port unless this deepening project is hurriedly implemented.

RESPONSE: The economic analysis was prepared by a nationally recognized consulting firm. It followed commonly-used procedures that were established to comply with Federal laws and regulations. The analysis and its conclusions will be reviewed independently by the US Army Corps of Engineers, who evaluates the economic justification for harbor improvements proposed across the entire country.

POWELL, GOLDSTEIN, FRAZIER & MURPHY LLP
ATTORNEYS AT LAW
Sixteenth Floor
191 Peachtree Street, N.E.
Atlanta, Georgia 30309
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E-mail: jcwillia@pgfm.com

June 22, 1998

Mr. William Bailey
United States Army Corps of Engineers
Savannah District
Environmental Resources Branch
P.0. Box 889
100 West Oglethorpe Avenue
Savannah, Georgia 31402

Re: Comments on DEIS for Savannah Harbor

Dear Mr. Bailey:

This law firm has been retained to represent Union Camp Corporation to review the April, 1998 Draft Environmental Impact Statement and other materials related to the United States Army Corps of Engineers proposed expansion of the Savannah Harbor.

We have comments on behalf of our client. However, due to the complexity and volume of materials (over 1500 pages), we hereby request additional time to review and expand our comments on these materials and other information that is available to us.

Would you reply by return fax to 404-572-5958. If you should have difficulty with transmission, please use our main fax number which is 404-572-6999.

Thank you for your assistance in this matter.

Very truly yours,

Joel C. Williams, Jr.

Letter response

POWELL, GOLDSTEIN, FRAZIER & MURPHY LLP
ATTORNEYS AT LAW
Sixteenth Floor
191 Peachtree Street, N.E.
Atlanta, Georgia 30309

June 22, 1998

COMMENT: We have comments on behalf of our client. However, due to the complexity and volume of materials (over 1500 pages), we hereby request additional time to review and expand our comments on these materials and other information that is available to us.

RESPONSE: Savannah District wrote Powell Goldstein on June 22, 1998 to inform them that the District had extended the review period until July 7, 1998.

THE PROPELLER CLUB OF THE UNITED STATES

PORT OF SAVANNAH

To Promote, Further and Support and To Aid in the Development of Needed River, American Merchant Marine Great Lakes and Harbor Projects

P.O. Box 9480

SAVANNAH, GEORGIA 31412

Mr. William Bailey
US Army Corps of Engineers
Planning Division
Environmental Research Branch
PO Box 889
100 W. Oglethorpe Avenue
Savannah, Georgia 31402

June 30, 1998

Dear Mr. Bailey,

It is on this occasion my honor to write you as President and on behalf of the Savannah Chapter of "The Propeller Club of the United States." Our local chapter has been active since February 1933 and the declaration of our organizational policy remains alert and attuned to the needs of our maritime industry locally as well as in the national interest. Consistent with our policy and vital needs of our Port, we herewith today notify you that we officially support the proposed Savannah Harbor Deepening, Project.

In recent years the size of ships utilize the Port of Savannah has grown far beyond levels previously predicted. Specifically, Savannah is seeing the large containerships today that were previously not projected to call the port for another 20 years. As a result of this growth in vessel size, the Savannah River Navigation Channel is not capable of adequately accommodating many of the ships now calling on the port. This inadequacy in channel depth forced over 52% of container ships serving the port of Savannah in 1996 to either load to less than capacity (tight-load) or wait until high tide to transit the channel. Such operational constraints lead to dramatic increases in transportation costs which are subsequently passed on to consumers and can ultimately force port users to seek more readily accessible facilities. Furthermore, as the world marketplace continues to grow, so too will these larger ships.

According, to the Savannah Harbor Deepening, Feasibility Study Report, significant changes will occur in the fleet of vessels utilizing the Port of Savannah, and the current 42' mean low water (mlw) channel depth will become increasing inadequate. According to tables 5-7, 5-8, and 5-9 of that Report:

1. Calls by vessels of less that 38feet of design draft will increase by over 640 percent.
2. Deep draft vessels (those drafting more than 38 feet) calls will increase by over 445 percent.
3. The first Post Panamax II vessel will call Savannah within the next decade if the channel deepened to 46 feet in depth or greater.
4. Post-Panamax vessels will not be placed in Savannah-calling rotations unless the channel is greater than 44 feet in depth or vessels are operated light-loaded (greater or equal to seven feet).
5. Overall vessel calls will increase by over 530 percent, averaging almost 4 percent per year.

These predictions clearly show the increased demands that will be placed on the Port of Savannah and the capacities necessary to accommodate those demands.

Furthermore, a 1997 Economic Impact Study showed that Georgia's public and private port terminals directly and indirectly impact 80,100 jobs, $1.8 billion in wages, $23 billion in revenue, and $585 million in state and local taxes annually. The Port of Savannah is the key component in the generation of those dynamic figures and serves as a conduit for balanced trade between over 20 states in the Southeast and the International marketplace. Thus, maintenance of an adequately navigable shipping channel at the port is critical to Georgia and the United States. Failure to meet the requirements of vessels, utilizing the Port of Savannah now and into the future will pose serious economic implications to our shipping industry.

To insure that the current success and future growth opportunities of Georgia’s shipping industry are preserved, we urge the U.S. Army Corps of Engineers and the Congress to move for immediate authorization of the Savannah Harbor Deepening, Project via the Water Resource Development Act of 1998.

Sincerely,
The Propeller Club of the United States
Port of Savannah

Edward W. Bazemore
President

CC: The Honorable Paul Coverdell
United States Senate
Washington, DC 20410
fax: (202) 228-3783

The Honorable Max Cleland
United States Senate
Washington, DC 20510
fax: (202) 224-0072

The Honorable Jack Kingston
United States House of Representatives
Washington, DC 20515
fax: (202) 226-2269

The Honorable Floyd Adams
Mayor, City of Savannah
PO Box 1027
Savannah, Georgia 31402
fax: (912) 651-6805

CDR- Raymond Seebald
Captain of the Port United States Coast Guard
222 W. Oglethorpe Ave. Suite 402
Savannah, Georgia 31401
Fax: (912) 652-4052

Mr. Doug J. Marchand -- Executive Director
Mr. David A. Shaller -- Deputy, Executive Director
Mr. James C. McCurry -- Port Planning and Harbor Development
Georgia Ports Authority
PO Box 2406
Savannah, Georgia 31402
fax: (912) 964-3855 and 966-3615

Mr. Charles Sutlive
Executive Director
Savannah Maritime Association
33 Bull Street, Suite 550
Savannah, Georgia 31401
Fax: (912) 232-1733

Mr. Richard Rominger
President elect (September 98)
US Propeller Club, Port of Savannah
Fax: (912) 236-4558

Letter response

THE PROPELLER CLUB OF THE UNITED STATES
PORT OF SAVANNAH
P.O. Box 9480
SAVANNAH, GEORGIA 31412

Date: June 30, 1998

1. COMMENT: Consistent with our policy and vital needs of our Port, we notify you that we officially support the proposed Savannah Harbor Deepening, Project.

RESPONSE: GPA is grateful for the Propeller Club's support for this project.

2. COMMENT: In recent years the size of ships utilize the Port of Savannah has grown far beyond levels previously predicted. Specifically, Savannah is seeing the large containerships today that were previously not projected to call the port for another 20 years. As a result of this growth in vessel size, the Savannah River Navigation Channel is not capable of adequately accommodating many of the ships now calling on the port. This inadequacy in channel depth forced over 52% of container ships serving the port of Savannah in 1996 to either load to less than capacity (tight-load) or wait until high tide to transit the channel. Such operational constraints lead to dramatic increases in transportation costs that are subsequently passed on to consumers and can ultimately force port users to seek more readily accessible facilities. Furthermore, as the world marketplace continues to grow, so too will these larger ships.

RESPONSE: No response necessary.

3. COMMENT: According, to the Savannah Harbor Deepening, Feasibility Study Report, significant changes will occur in the fleet of vessels using the Port of Savannah, and the current 42' MLW channel depth will become increasing inadequate. These predictions clearly show the increased demands that will be placed on the Port of Savannah and the capacities necessary to accommodate those demands.

RESPONSE: No response necessary.

4. COMMENT: Furthermore, a 1997 Economic Impact Study showed that Georgia's public and private port terminals directly and indirectly impact 80,100 jobs, $1.8 billion in wages, $23 billion in revenue, and $585 million in state and local taxes annually. The Port of Savannah is the key component in the generation of those dynamic figures and serves as a conduit for balanced trade between over 20 states in the Southeast and the International

marketplace. Thus, maintenance of an adequately navigable shipping channel at the port is critical to Georgia and the United States. Failure to meet the requirements of vessels using the Port of Savannah now and into the future will pose serious economic implications to our shipping industry.

RESPONSE: No response necessary.

5. COMMENT: To insure that the current success and future growth opportunities of Georgia's shipping industry are preserved, we urge the Corps and the Congress to move for immediate authorization of the Savannah Harbor Deepening, Project via the WRDA of 1998.

RESPONSE: GPA is grateful for the Propeller Club's support for this project.

SAVANNAH AREA
CHAMBER OF COMMERCE

June 17,1998

Colonel Grant Smith
United States Army Corps of Engineers
Savannah District
100 W. Oglethorpe Avenue
P.0. Box 889
Savannah, GA 31402-0889

Re: Savannah Harbor Expansion
Draft Environmental Impact Statement ("DEIS")

Dear Colonel Smith:

I am writing as Chairman of the Manufacturers Council of the Savannah Area Chamber of Commerce. The following companies join in the letter:

Blue Circle Cement, Inc.
Colonial Terminals
City of Savannah
Engelhard Corporation
Fort James Corporation
Hercules, Inc.
Jonaro Technomar Services, Inc.
Kemira Pigments,. Inc.
Savannah Foods
Southern Marine
Stone Container Corporation
Synergistic Dynamics, Inc,
Union Camp
Zim-American Israeli Shipping Co. Inc.

We write to request that the United States Army Corps of Engineers (the "Corps') extend the comment period by an additional 60-90 days for the DEIS of the proposed Savannah Harbor Expansion. This request is based upon the following factors:

1. The DEIS and associated documents are extraordinarily voluminous (approximately 1500 pages), highly technical, and complex. For example, major support for the conclusions and statements in the DEIS is found in computer modeling of the Savannah River which predicts the potential effects of the proposed Expansion. Members of the public have not had an adequate opportunity to understand the intricacies of the model used, and are not in a position to comment in its premises, methodology, or results. More time is needed to fully comprehend the consequences of the Corps' proposed action and to compile comments.

2. The current 45-day comment period is not consistent with one of the major purposes of the National Environmental Policy Act ("NEPA"), 42 U.S.C. sec 4321 et seq. (1998), in that the public is simply not being allowed an adequate opportunity to understand the effects of a very complicated and important federal action. Consistent with 33 C.F.R. sec 230.19(a) (1997), the District Engineer has discretion to extend the duration of the public comment period where a proposed action is expansive in scope or unusually complex. The proposed Savannah Harbor Expansion is a situation of sufficient importance to the community, and of sufficient complexity, that full public participation is needed. Exercise of your discretion to expand the time for comments is appropriate in this case and will ensure that the purposes of NEPA are fulfilled.

We appreciate very much your attention to this matter.

Sincerely,

Robert J. Scanlon

cc: Ms. Amy Hughes

Savannah Area Chamber of Commerce
222 West Oglethorpe Avenue, Suite 100
Savannah, Georgia 31401
P.O. Box 1628
Savannah, Georgia 31402-1628
Phone: (912)944-0444
Fax: (912)944-0468

Letter response

SAVANNAH AREA CHAMBER OF COMMERCE

222 West Oglethorpe Avenue, Suite 100
Savannah, Georgia 31401
P.O. Box 1628
Savannah, Georgia 31402-1628

June 17,1998

1. COMMENT: The Manufacturers Council of the Savannah Area Chamber of Commerce requests that the Corps extend the comment period by an additional 60-90 days.

RESPONSE: Savannah District wrote the Chamber of Commerce on June 22, 1998 to inform them that the District had extended the review period until July 7, 1998.

2. COMMENT: The DEIS and associated documents are extraordinarily voluminous (approximately 1500 pages), highly technical, and complex. Major support for the conclusions and statements in the DEIS is found in computer modeling of the Savannah River which predicts the potential effects of the proposed Expansion. Members of the public have not had an adequate opportunity to understand the intricacies of the model used, and are not in a position to comment in its premises, methodology, or results. More time is needed to fully comprehend the consequences of the Corps' proposed action and to compile comments.

RESPONSE: Savannah District believes that the total review time of 60 days is sufficient to provide interested parties with an opportunity to review the study documents and provide any responses they may have.

3. COMMENT: The current 45-day comment period is not consistent with one of the major purposes of NEPA, in that the public is simply not being allowed an adequate opportunity to understand the effects of a very complicated and important federal action. Consistent with 33 C.F.R. sec 230.19(a) (1997), the District Engineer has discretion to extend the duration of the public comment period where a proposed action is expansive in scope or unusually complex. The proposed Savannah Harbor Expansion is a situation of sufficient importance to the community, and of sufficient complexity, that full public participation is needed. Exercise of your discretion to expand the time for comments is appropriate in this case and will ensure that the purposes of NEPA are fulfilled.

RESPONSE: Savannah District believes the purposes of NEPA will be fulfilled by the extended review and comment period.

Savannah Area Chamber of Commerce (July 6)

SAVANNAH
AREA
CHAMBER OF COMMERCE

July 6, 1998

Mr. William Bailey
Department of the Army
Corps of Engineers
Savannah District
Environmental Resources Branch
Post Office Box 889
100 West Oglethorpe Avenue
Savannah, Ga 31402-0889

RE: Savannah Harbor Expansion - Draft Environmental Impact Statement

Dear Mr. Yuschishin

Thank you for the opportunity to comment on the proposed deepening of the Savannah Harbor. On behalf of the Savannah business community, I also thank you for the 15-day extension of the public comment period. As you know, the extension enabled the occurrence of meaningful dialogue between the manufacturing community, the U.S. Army Corps of Engineers and the Georgia Ports Authority which will result in more substantive and complete comments on the project.

The Savannah River is the highway which connects our community and our state to the world. The Savannah Harbor is an economic engine which drives our local economy. Businesses locate in Savannah and in Georgia because of this important resource. In recognition of the predicted increase in ship size, we realize the necessity of remaining a competitive player in the global shipping industry. Savannah cannot afford to become a feeder port. We must prepare ourselves to welcome the larger container ships into our Harbor.

Therefore, the business community supports deepening of the Harbor in order to position Savannah competitively in the global market, provided that the deepening does not degrade the Savannah River specifically with regards to dissolved oxygen content and chlorides. Funding for mitigation of the adverse affects of increased chlorides and decreased dissolved oxygen levels must be included in the total project cost estimates and in the Water Resources Development Act ("WRDA") authorization language. Based on meetings between the Manufacturers Council of the Savannah Area Chamber of

Commerce and Georgia Ports Authority Executive Director Doug Marchand, it is our understanding that GPA will add the costs of funding these mitigation projects to the cost estimates of the project.

Following is a compilation of concerns expressed by members of the Savannah Area Chamber of Commerce Manufacturers Council, Maritime Council and Harbor Committee. These concerns must be addressed during the design phase and supplemental EIS phase of the project.

Dissolved Oxygen

The Draft Environmental Impact Statement predicts that the dissolved oxygen level in the River may be reduced by 1 mg/L yet there is nothing in the document addressing mitigation of these negative effects. As currently drafted, the proposal would result in portions of the Savannah River violating Georgia Water Quality standards and would violate the anti--degradation policies of Georgia, South Carolina and the federal government. A private company would not be allowed to degrade the resource. Similarly, a state governmental authority should be held to the same "do no harm" standards. Deepening the harbor is an oxygen-consuming activity which should be treated the same as other oxygen-consuming activities such as industrial and municipal wastewater discharges. A commitment to funding a mitigation effort to return the River to its existing dissolved oxygen level must be included in the authorization of the deepening project.

In an attempt to help the deepening project move forward, the Savannah manufacturing community spent a considerable amount of money investigating mitigation projects around the Country which may provide some ideas for similar projects to restore the Savannah River to its existing standards. Based on research provided by Law Engineering, it is estimated that one type of effective aeration system would cost approximately $24 million to construct and approximately $1 million annually to operate. Construction, operating and maintenance funds for the mitigation project must be included in project costs. Clearly, the NEPA process requires that other aeration options must be analyzed for feasibility as well.

Modeling Concerns

The model used to calculate the predicted dissolved oxygen levels has not gone through significant peer review. Representatives of local industry repeatedly have been denied access to the model. Due to the precedent setting nature of model selection, local stakeholders should be permitted to have some input as to whether the model is the appropriate model to use and to review the calibrations to determine the accuracy of the model for this particular issue. Comments submitted by the Harbor Committee of the Savannah Area Manufacturers Council outline specific modeling concerns in detail.

The Chamber specifically requests the creation of a Technical Advisory Group which includes industrial stakeholders from the Harbor Committee to participate in future modeling efforts and to address the solutions to the issues of Dissolved Oxygen and Chlorides.

Chlorides

Local industries depend heavily on the City of Savannah 58 MGD surface water treatment facility known as the "I & D plant" as their exclusive supplier of surface water. Several industrial companies rely exclusively on the I & D plant for all of their water needs. Chatham County and the State of Georgia have adopted a Coastal Georgia Groundwater Management Plan which requires that industries reduce their reliance on groundwater by substituting I & D water. Comments submitted to the Corps of Engineers by the City of Savannah do an excellent job explaining the many technical concerns concerning chlorides.

The DEIS states that the increase of chloride levels at the intake of the I & D plant located 8 miles upstream of the project limits are indeterminate. This is due to model insufficiencies.

The DEIS proposes that mitigation of increased chloride levels would only occur if the levels rise above drinking water standards of 250 ppm. The City of Savannah currently guarantees its customers that chlorides will not exceed 10 ppm. Any increase in the fresh water chloride content will have a significant economic impact on all industrial users. Each industry would be required to invest potentially millions of dollars in capital expenditures depending on the concentration. Furthermore, additional chlorides increase corrosion and the rate of equipment failure. The Economic Impact portion of the Feasibility Report does not address the costs to industries who utilize I & D water.

Moving the I & D intake or artificially increasing the flow rate are the only alternatives suggested. The Corps must conduct a study to predict and minimize the increased level of chloride. Once again, NEPA requires a more thorough evaluation of the alternatives for the I & D intake and potential chloride mitigation projects. Suggested funding of $46 million for a possible mitigation alternative must be included in the WRDA authorization of the project. Changes to the water supply quality must be determined and required process modifications must be complete prior to the commencement of any work associated with this project. We request a supplement EIS to address the issues of chlorides and dissolved oxygen.

Property Issues

It is of particular concern to industries and private docking terminals located along the River that the Harbor Wideners for the project have not yet been determined. Businesses along the River do not know if their property will be impacted or the structural integrity of their docks compromised. It is premature to ask businesses to comment on the project without the benefit of knowing how the deepening will directly affect their property and operations. In addition, this is a violation of NEPA which requires the DEIS to address the potential impacts of the project.

Study of Alternative Depths

NEPA clearly requires the Corps to provide a detailed statement of alternatives to the proposed action. Rather than looking at the environmental impacts of depths other than 50 feet, the only alternative evaluated was "no action." This look at the 50 foot deepening as a worst case scenario could potentially set a precedent for model selection should these projections be used for other purposes. This underscores the importance of the acceptance of the model by the industrial stakeholders in the River.

It is our understanding that other depths would have been evaluated as part of the traditional authorization process but were specifically avoided by GPA due to the fast track nature of the Section 203 process and the need to meet the WRDA '98 Congressional timetable.

Dredge Spoil Disposal

The previous deepening project created increased sedimentation rates in the channel and individual berths along the River. This increase required more frequent and costly maintenance dredging operations to be performed by all the facilities on the River to maintain their usable water depths. As shown in the DEIS, several disposal areas are near capacity. The project will require tagging of certain disposal areas for the deepening project thus limiting the amount of upland disposal facilities available for private terminals to use for their maintenance dredging work. This would have an economic impact on the other harbor users which should be reflected in the Feasibility Study under the requirements of NEPA.

Project Scope

Several of the companies located up-river and adjacent to the project expressed concern that the deepening project stops short of their facilities and that they were not consulted regarding the boundaries of the project. Several of these companies would have also realized significant economic benefits as a result of the deepening. When they asked GPA if the remaining 9500-foot segment of the river could be included in the 32.5-mile project, they were told that they should pursue a separate deepening project under the Section 203 process. The deepening should be representative of all of the interests of the businesses which depend on the Harbor. The project scope must relect and maintain the Savannah Harbor as a multi-use estuary.

One-way River Traffic

In addition, several companies have expressed concern regarding the potential one-way traffic on the River upon the arrival and departure of mega-ships. The uncertainty surrounding this issue must be clarified. The negative economic impact to other companies resulting from delay of their vessels as a result of a new one-way traffic policy should have been evaluated as a potential economic impact of the deepening as part of the Feasibility Study.

Summary

While the Georgia Ports Authority plays a significant role in the local economy, the manufacturing sector as a whole is responsible for 40% of the primary economy. In other words, 40% of the new money coming into the local economy is directly attributable to the local manufacturing industry. These companies should not be made to pay for the unintended yet predictable consequences of the harbor deepening. Evaluation of the economic impact on this significant portion of our local economy should have been included in the Feasibility Study as part of the NEPA requirements. Without mitigation of degradation to the River, the financial impacts on local industries are estimated to be tens of millions of dollars. These significant capital expenditures required as a result of the deepening would cause economic hardship on the local economy.

Thus, in order for the deepening project to be good for Savannah as a whole, the authorization for the project must include funding for and a commitment to mitigation of deleterious impacts on the River resulting from the deepening. Based on our discussions with Mr. Marchand of GPA, it is our understanding that GPA will ask Congress to include this mitigation funding in the project authorization. With mitigation funding for dissolved oxygen and chlorides included as line items in the Feasibility Study, Authorization Bill and Appropriations Bill, the Savannah Area Manufacturers Council supports the proposed deepening project.

Respectfully submitted,

Amy Hughes
Executive Director
Savannah Area Manufacturers Council

Letter response

SAVANNAH AREA CHAMBER OF COMMERCE
222 West Oglethorpe Avenue, Suite 100
Savannah, Georgia 31401
P.O. Box 1628

Date: July 6, 1998

1. COMMENT: Thank you for the 15-day extension of the public comment period. The extension enabled the occurrence of meaningful dialogue between the manufacturing community, the Corps and GPA that will result in more substantive and complete comments on the project.

RESPONSE: The extension was granted with the intent of allowing more complete discussion and airing of views concerning this proposed project.

2. COMMENT: The Savannah River is the highway which connects our community and our state to the world. The harbor is an economic engine which drives our local economy. Businesses locate in Savannah and in Georgia because of this important resource. In recognition of the predicted increase in ship size, we realize the necessity of remaining a competitive player in the global shipping industry. Savannah cannot afford to become a feeder port. We must prepare ourselves to welcome the larger container ships into our harbor.

RESPONSE: GPA concurs in the harbor's economic value to the community, the state, and the southeast US.

3. COMMENT: Therefore, the business community supports deepening the harbor in order to position Savannah competitively in the global market, provided that the deepening does not degrade the Savannah River specifically with regards to D.O. content and chlorides. Funding for mitigation of the adverse affects of increased chlorides and decreased dissolved oxygen levels must be included in the total project cost estimates and in the WRDA authorization language. Based on meetings between the Manufacturers Council of the Savannah Area Chamber of Commerce and GPA Executive Director Doug Marchand, it is our understanding that GPA will add the costs of funding these mitigation projects to the cost estimates of the project.

RESPONSE: The proposed project was revised in the final study documents to include funding for mitigation of adverse impacts on dissolved oxygen in the harbor and chlorides at the City's industrial water intake.

4. COMMENT: Following is a compilation of concerns expressed by members of the Savannah Area Chamber of Commerce Manufacturers Council, Maritime Council and Harbor Committee. These concerns must be addressed during the design phase and Tier II EIS phase of the project.

RESPONSE: The major concerns, DO levels in the harbor and chloride levels at the City's industrial water intake are included in the final study documents. Detailed studies of these items will be performed during the CED phase of the project.

5. COMMENT: Dissolved Oxygen -- The DEIS predicts that the D.O. level in the river may be reduced by 1 mg/L yet there is nothing in the document addressing mitigation of these negative effects. As currently drafted, the proposal would result in portions of the Savannah River violating Georgia Water Quality standards and would violate the anti-degradation policies of GA, SC and the federal government. A state governmental authority should be held to the same "do no harm" standards. Deepening the harbor is an oxygen-consuming activity that should be treated the same as other oxygen-consuming activities such as industrial and municipal wastewater discharges. A commitment to funding a mitigation effort to return the River to its existing dissolved oxygen level must be included in the authorization of the deepening project.

RESPONSE: The proposed project was revised in the final study documents to include funding for mitigation of adverse impacts on dissolved oxygen in the harbor.

6. COMMENT: In an attempt to help the deepening project move forward, the Savannah manufacturing community spent a considerable amount of money investigating mitigation projects around the Country which may provide some ideas for similar projects to restore the Savannah River to its existing standards. Based on research provided by Law Engineering, it is estimated that one type of effective aeration system would cost approximately $24 million to construct and approximately $1 million annually to operate. Construction, operating and maintenance funds for the mitigation project must be included in project costs. Clearly, the NEPA process requires that other aeration options must be analyzed for feasibility as well.

RESPONSE: The proposed project was revised in the final study documents to include funding for mitigation of adverse impacts on dissolved oxygen in the harbor. Detailed study of measures to increase DO levels will be conducted during CED.

7. COMMENT: Modeling Concerns -- The model used to calculate the predicted D.O. levels has not gone through significant peer review. Representatives of local industry repeatedly have been denied access to the model. Due to the precedent setting nature of model selection, local stakeholders should be permitted to have some input as to whether the model is the appropriate model to use and to review the calibrations to

determine the accuracy of the model for this particular issue. Comments submitted by the Harbor Committee of the Savannah Area Manufacturers Council outline specific modeling concerns in detail.

RESPONSE: The Chamber of Commerce will be allowed to review the modeling work as it continues during CED.

8. COMMENT: The Chamber specifically requests the creation of a Technical Advisory Group which includes industrial stakeholders from the Harbor Committee to participate in future modeling efforts and to address the solutions to the issues of D.O. and Chlorides.

RESPONSE: The Chamber of Commerce will be allowed to review the modeling work as it continues during CED.

9. COMMENT: Chlorides -- Local industries depend heavily on the City of Savannah 58 MGD surface water treatment facility known as the "I & D plant" as their exclusive supplier of surface water. Several industrial companies rely exclusively on the I & D plant for all of their water needs. Chatham County and the State of Georgia have adopted a Coastal Georgia Groundwater Management Plan which requires that industries reduce their reliance on groundwater by substituting I & D water. Comments submitted to the Corps by the City do an excellent job explaining the many technical concerns concerning chlorides.

RESPONSE: In recognition of the large potential adverse impacts that significant increases in chloride levels would have on industrial users, GPA included funding for the mitigation action deemed by the City of Savannah to be necessary to protect the quality of the intake water.

10. COMMENT: The DEIS states that the increase of chloride levels at the intake of the I & D plant located 8 miles upstream of the project limits are indeterminate. This is due to model insufficiencies.

RESPONSE: In recognition of the large potential adverse impacts that significant increases in chloride levels would have on industrial users, GPA included funding for the mitigation action deemed by the City of Savannah to be necessary to protect the quality of the intake water.

11. COMMENT: The DEIS proposes that mitigation of increased chloride levels would only occur if the levels rise above drinking water standards of 250 ppm. The City of Savannah currently guarantees its customers that chlorides will not exceed 10 ppm. Any increase in the fresh water chloride content will have a significant economic impact on all industrial users. Each industry would be required to invest potentially millions of dollars in capital expenditures depending on the concentration. Furthermore, additional

chlorides increase corrosion and the rate of equipment failure. The economic analysis does not address the costs to industries who use I & D water.

RESPONSE: In recognition of the large potential adverse impacts that significant increases in chloride levels would have on industrial users, GPA included funding for the mitigation action deemed by the City of Savannah to be necessary to protect the quality of the intake water.

12. COMMENT: Moving the I & D intake or artificially increasing the flow rate are the only alternatives suggested. The Corps must conduct a study to predict and minimize the increased level of chloride. Once again, NEPA requires a more thorough evaluation of the alternatives for the I & D intake and potential chloride mitigation projects. Suggested funding of $46 million for a possible mitigation alternative must be included in the WRDA authorization of the project. Changes to the water supply quality must be determined and required process modifications must be complete prior to the commencement of any work associated with this project. We request a supplement EIS to address the issues of chlorides and dissolved oxygen.

RESPONSE: The proposed project was revised in the final study documents to include funding for mitigation of adverse impacts on dissolved oxygen in the harbor and chlorides at the City's industrial water intake.

13. COMMENT: Property Issues -- It is of particular concern to industries and private docking terminals located along the River that the wideners for the project have not yet been determined. Businesses along the River do not know if their property will be impacted or the structural integrity of their docks compromised. It is premature to ask businesses to comment on the project without the benefit of knowing how the deepening will directly affect their property and operations. In addition, this is a violation of NEPA which requires the DEIS to address the potential impacts of the project.

RESPONSE: The bend wideners were designed using engineering experience and the best available information. The conclusions of those designs will be confirmed using the ship simulator. If revisions in the project design are necessary that significantly alter the expected environmental impacts as the design becomes more detailed, a separate NEPA document would be prepared.

14. COMMENT: Study of Alternative Depths -- NEPA clearly requires the Corps to provide a detailed statement of alternatives to the proposed action. Rather than looking at the environmental impacts of depths other than 50 feet, the only alternative evaluated was "no action." This look at the 50 foot deepening as a worst case scenario could potentially set a precedent for model selection should these projections be used for other purposes. This underscores the importance of the acceptance of the model by the industrial stakeholders in the River.

RESPONSE: The other channel deepening alternatives were judged to have less environmental impact than the one evaluated in detail -- 50-foot authorized depth. A detailed evaluation of the effects of the 44', 46, and 58' channel will be performed during the CED phase. The results of those investigations will be reported in a Tier II EIS.

15. COMMENT: It is our understanding that other depths would have been evaluated as part of the traditional authorization process but were specifically avoided by GPA due to the fast track nature of the Section 203 process and the need to meet the WRDA '98 Congressional timetable.

RESPONSE: The other channel deepening alternatives were judged to have less environmental impact than the one evaluated in detail -- 50-foot authorized depth. A detailed evaluation of the effects of the 44', 46, and 48' channel will be performed during the CED phase. The results of those investigations will be reported in a separate EIS.

16. COMMENT: Dredge Spoil Disposal -- The previous deepening project increased sedimentation rates in the channel and individual berths along the River. This increase required more frequent and costly maintenance dredging operations to be performed by all the facilities on the River to maintain their usable water depths. As shown in the DEIS, several disposal areas are near capacity. The project will require tagging of certain disposal areas for the deepening project thus limiting the amount of upland disposal facilities available for private terminals to use for their maintenance dredging work. This would have an economic impact on the other harbor users that should be reflected in the Feasibility Study under the requirements of NEPA.

RESPONSE: The Federal Project's CDFs are available for other harbor users only when such use would not interfere with the Project's use of those sites. That condition would continue during with implementation of the proposed deepening project. Therefore, no adverse impact on the other harbor users would occur.

17. COMMENT: Project Scope --Several of the companies located up-river and adjacent to the project expressed concern that the deepening project stops short of their facilities and that they were not consulted regarding the boundaries of the project. Several of these companies would have also realized significant economic benefits as a result of the deepening. When they asked GPA if the remaining 9500-foot segment of the river could be included in the 32.5-mile project, they were told that they should pursue a separate deepening project under the Section 203 process. The deepening should be representative of all of the interests of the businesses which depend on the harbor. The project scope must relect and maintain the harbor as a multi-use estuary.

RESPONSE: GPA initiated and performed this Section 203 study on its own. It limited the scope of the investigations to those which had a direct impact on the terminal facilities open to all the citizens of Georgia. Companies located further upriver could follow

a similar process should they desire an improvement to the Federal Navigation Project located adjacent to their facilities.

18. COMMENT: One-Way River Traffic -- In addition, several companies have expressed concern regarding the potential one-way traffic on the river upon the arrival and departure of mega-ships. The uncertainty surrounding this issue must be clarified. The negative economic impact to other companies resulting from delay of their vessels as a result of a new one-way traffic policy should have been evaluated as a potential economic impact of the deepening as part of the Feasibility Study.

RESPONSE: The delays expected to occur with the use of larger vessels in the harbor was included in the economic analysis.

19. COMMENT: Summary -- While the Georgia Ports Authority plays a significant role in the local economy, the manufacturing sector as a whole is responsible for 40% of the primary economy. In other words, 40% of the new money coming into the local economy is directly attributable to the local manufacturing industry. These companies should not be made to pay for the unintended yet predictable consequences of the harbor deepening. Evaluation of the economic impact on this significant portion of our local economy should have been included in the Feasibility Study as part of the NEPA requirements. Without mitigation for degradating the river, the financial impacts on local industries are estimated to be tens of millions of dollars. These significant capital expenditures required as a result of the deepening would cause economic hardship on the local economy.

RESPONSE: The proposed project was revised in the final study documents to include funding for mitigation of adverse impacts on dissolved oxygen in the harbor and chlorides at the City's industrial water intake.

20. COMMENT: Summary --In order for the deepening project to be good for Savannah as a whole, the authorization must include funding for and a commitment to mitigate of deleterious impacts on the River resulting from the deepening. Based on our discussions with GPA, it is our understanding that GPA will ask Congress to include this mitigation funding in the project authorization. With mitigation funding for D.O. and chlorides included as line items in the Feasibility Study, Authorization Bill and Appropriations Bill, the Savannah Area Manufacturers Council supports the proposed deepening project.

RESPONSE: The proposed project was revised in the final study documents to include funding for mitigation of adverse impacts on dissolved oxygen in the harbor and chlorides at the City's industrial water intake.

SAVANNAH
AREA
CHAMBER OF COMMERCE

July 7, 1998

Mr. William Bailey
United States Army Corps of Engineers
Savannah District
Environmental Resources Branch
P.O. Box 889
1 00 West Oglethorpe Avenue
Savannah, Georgia 31402

Re: April, 1998 Draft Environmental Impact Statement and Draft Feasibility Study for the Proposed Expansion of the Savannah Harbor

Dear Mr. Bailey:

These comments are being provided by the members of the Harbor Committee of the Savannah Manufacturers' Council (the "Members") who are signatories to this letter. We appreciate the opportunity to review the April, 1998 Draft Environmental Impact Statement (the "DEIS"), Draft Feasibility Study, and other materials related to the United States Army Corps of Engineers' (the "Corps") proposed expansion of the Savannah Harbor (the "Project"). At the outset we wish to stress that it is not our intention to compromise this harbor deepening project. Rather we have identified a number of concerns that we believe can and must be addressed to ensure that the integrity of the Harbor is protected and that the other users of this resource are not left with the responsibility of mitigating any impacts that the Project may have on the Savannah River.

1. Project Summary

The Corps proposes to expand the existing navigation facilities at Savannah Harbor, located in Chatham County, Georgia and Jasper County, South Carolina, by deepening the channel to the ocean from 2 to 8 feet. The Corps has indicated that its preferred alternative involves a deepening of 8 feet, for a total channel depth of 50 feet.

2. Comments Summary

The Project is projected to lower concentrations of dissolved oxygen ("DO") in affected areas of the Savannah River to concentrations below those permissible under Georgia law. In addition, the Project's reduction of DO concentrations violates anti-degradation principles central

to Georgia's, South Carolina's, and federal regulatory schemes designed to protect water quality. The Project is also predicted to increase salinity levels in the River in a manner which will substantially and negatively impact the undersigned. Further, the Corps' utilization of River modeling with respect to Project impacts on DO and salinity levels contain numerous deficiencies. Finally, the Corps' discussions of the Project and Project impacts do not comport with the requirements of the National Environmental Policy Act ("NEPA"), 42 U.S.C. §§ 4321 et seq. (1998), and its implementing regulations, located at 40 C.F.R. §§ 1500 et seq. (1997) and 33 C.F.R. Part 336 (1997). The Members believe that certain mitigation measures can be implemented which will not only alleviate the negative impacts of the Project but may also provide the basis for further enhancing overall water quality in the Savannah River in the future. The Members believe that the Project should proceed only if cost estimates for such mitigation measures are properly included in the Final Feasibility Study and a commitment to develop a Supplemental EIS is included in a final EIS that responds to the Members' many concerns.

3. State and Federal Laws Implicated by the DEIS

Expanding the Savannah Harbor as proposed in the DEIS does not comply various state and federal statutes, as well as the Corps' own regulations governing such projects. A discussion of the nature of these violations is briefly set forth below.

A. The Project Predicts Violations of State DO Criteria

Pursuant to the Georgia Water Quality Control Act, Georgia has promulgated regulations intended to enhance water quality and prevent pollution. See Ga. Comp. R. & Regs. r. 391-3-6.03(2)(a). Pursuant to these regulations, Georgia currently classifies the portion of the Savannah River running from the Seaboard Coastline Railroad Bridge (River Mile 27.4) to Fort Pulaski (River Mile 0) as a "Coastal Fishing" area. Id. r. 391-3-6-.03(13). Pursuant to those regulations, DO in the above-referenced portion of the Savannah River may be "no less than 3.0 mg/L in June, July, August, September, and October; not less than 3.5 mg/L in May and November; and no less than 4.0 mg/L in December, January, February, March and April." Id. r. 391-3-6-.03(13) n.1. The regulations note that the DO criteria for that portion of the Savannah River are instantaneous minimums. Id.

GPA's hydrodynamic model predicts that the Project will reduce concentrations of DO present in affected areas of the Savannah River in an amount up to 1 mg/L. DEIS, §§ 5, at 48.[1]

According to the DEIS, the proposed dredging to a depth of 50 feet in the Front River "and, consequently higher stratification, [will] cause local reduction in the overall water column reaeration due to a reduced vertical mixing and increased distance from the bottom layers to the surface." DEIS, § 5, at 28-29. The DEIS also notes that in the 50th percentile DO impacts increase between River Miles 12 and 20.5 to a maximum impact of 0.9 mg/L at the highest estimated flow rate; ninetieth percentile impacts indicate a reduction in DO concentrations of up to 1 mg/L near River Mile 17. Id. at 29.

The predicted reduction in DO concentrations may cause the affected areas of the Savannah River to drop below the minimum DO concentrations established by the State of Georgia.[2] Because the Project may reduce DO concentrations in violation of Georgia's water quality standards, the Corps should reevaluate its proposed dredging plans in order to ensure compliance with such standards.[3]

B. The Project Violates State and Federal Anti-Degradation Principles

The Project, by reducing DO concentrations below those permitted under Georgia law, violates that State's anti-degradation mandate. In addition, because the Project will, inter alia, degrade the quality of the Savannah River in terms of DO, the Project violates the anti-degradation principles of the South Carolina Pollution Control Act, S. C. Code Ann. §§ 48-1-10 et seq. (1998), and of the Federal Water Pollution Control Act (the "Clean Water Act" or "CWA"), 33 U.S.C. § 1251 et seq. (1998).

C. The Project May Result in a Harmful Increase in Chloride Levels in the Lower Savannah River

One significant side effect of the Project's predicted increase in salinity involves the resulting increase in chloride present in certain portions of the Lower Savannah River. According to the DEIS, the Project will, in all likelihood, cause chloride levels to increase proximate to the City of Savannah's raw water intake, located on a tributary of the Savannah River located approximately 8 miles upstream of the harbor project limits. DEIS, § 1.4. Any increase in the fresh water chloride content will have a significant economic impact on all industrial users.[4]

Furthermore, an increase in chloride concentrations will result in increased corrosion, a higher rate of equipment failure, and product quality problems at the plants of certain stakeholders. Any facility which emphasizes the re-use of process water will be placing itself at greater risk of economic harm when including non-process-elements, including additional chlorides, in its processes. Regrettably, the Economic Impact portion of the Draft Feasibility Study fails to address the above or similar costs to stakeholders who utilize Industrial and Domestic ("I&D") water for boilers or for the direct processing of products.

The DEIS attempts to downplay the significant impact that increased concentrations of chloride will have on I&D water systems by suggesting that affected intakes can be moved or that the flow rate into such intakes can be artificially increased. DEIS, § 5, at 32. In its Comments to the Corps on the Project, however, the City of Savannah estimates the cost of water intake relocation to be approximately $46 million. See Comments of the City of Savannah (June 12, 1998 and July 7, 1998). The substantial amount of money required to compensate for the predicted change in chloride concentrations warrants additional attention in the EIS.

Finally, it should be noted that if use of Savannah River water becomes less feasible, additional pressure may be brought to bear on underground water sources. The Corps should seek to avoid placing such pressure on such valuable, limited resources.

D. GPA's Modeling Efforts are Deficient with Respect to DO, Salinity, and Other Crucial Impacts of the Project on the Environment

The GPA utilized several models in order to predict Project impacts on DO, salinity, and other crucial ecological factors. In the limited time available to it, the Members have been able to solicit the views of Law Engineering and Environmental Services, Inc. ("Law") and Dr. James L. Martin, Ph.D., P.E., of AScI Corporation, regarding the Corps' modeling efforts. The evaluation of GPA's modeling efforts developed by Law and Dr. Martin[5] is set forth as Exhibit 1 to these comments.

E. The Corps' Letter response of the Project does not Comply with NEPA and its Implementing Regulations

NEPA requires that agencies of the federal government include in proposals for "major Federal actions significantly affecting the quality of the human environment a detailed statement" of, among other things: (1) the environmental impact of the proposed action; (2) any adverse environmental effects which cannot be avoided should the proposal be implemented; and (3) alternatives to the proposed action. 42 U.S.C. § 4332(C)(i)-(iii). Such agencies must also "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." Id. § 4332(E). Regulations implementing NEPA are found at 40 C.F.R. § 1500 et seq. (1997) (CEQ regulations) and 33 C.F.R. Part 336 (1997) (Corps regulations concerning discharge of dredged material into waters of United States).

The April, 1998 DEIS prepared by the Corps is insufficient for purposes of NEPA because, among other things,

(1) the Corps fails to adequately discuss the environmental impacts of dredging to depths other than to the Corps-recommended 50-foot depth,

(2) the Corps fails to identify any adverse environmental effects which cannot be avoided should the proposal be implemented, or which could be avoided through dredging to depths other than to 50 feet;

(3) the Corps fails to state that its recommended alternative will, in all likelihood, violate the law of the State of Georgia;

(4) the Corps fails to discuss DO or salinity concentrations at depths other than 50 feet;

(5) the Corps does not adequately discuss the impacts of the Project on the shortnose sturgeon and striped bass;

(6) the Corps has not conducted any studies of alternatives to its recommended 50 foot dredging depth which might resolve conflicts related to the existing, competing uses of the natural resources of the Savannah River;

(7) the Corps has failed to consider any mitigation measures related to the projected increase in salinity and decrease in DO for any of the alternatives;

(8) the Corps has failed to identify reasons why it selected the 50 foot depth alternative when the greatest benefits versus costs appear at a depth of 46 feet;

(9) as more fully set forth in Paragraph D, above, flaws in the Corps' model prevent the Corps from providing an accurate statement concerning the Project's environmental impacts;

(10) given the Project's scope and complexity, the Corps has failed to provide sufficient time for the public to comment on the DEIS; and

(11) given the Project's scope, complexity, and significant environmental impacts, the Corps, as a general matter, has not conducted sufficient information gathering for the DEIS to meet NEPA's "detailed statement" requirement.

If finalized, the DEIS, as currently presented, would undoubtedly be deemed by any reviewing court to be arbitrary, capricious, or otherwise not in accordance with the law.[6]

4. Actions Needed

For all of the reasons set forth above, the Project, as proposed, should not go forward. The Members can, however, support the Project if the following actions are undertaken by the Corps and GPA:

A. Mitigation measures are undertaken to eliminate the predicted DO deficit.

The Members believe that mitigation measures related to the predicted DO deficit must take place. To support this effort, the Members have commissioned Law to study mitigation measures that could eliminate the predicted decrease in DO. Law, assisted by Vanderbilt University professor Dr. Richard Speece, has developed a preliminary feasibility study,[7] a copy of which is attached as Exhibit 2. In this study, Law identified alternative mechanisms for providing additional aeration to the River.

The Members believe that, of the mitigation mechanisms, the "U-Tube" alternative should be included in the Project as the preferred mitigation measure. It should be noted, however, that although the Members recommend the most expensive of the suggested mitigation mechanisms, the Corps should investigate and consider all reasonable alternatives in a manner consistent with NEPA as a part of its final environmental impact statement ("EIS"). The Corps should further ensure that the Draft Feasibility Study and DEIS are revised to include specific, independent line-items for any DO mitigation mechanism(s) selected in order to ensure that sufficient funds for such mitigation are both authorized and appropriated by Congress as a part of its review of the Project.8

B. Mitigation measures are undertaken to avoid the negative effects of increased chloride levels.

The City of Savannah has already provided comments regarding the necessity for mitigating the predicted increase in chloride levels. The Members agree with these comments, and believes that the Project should proceed only if funds are included to undertake the necessary mitigation measures with respect to the predicted chloride increase (i.e., the Corps should ensure that the City's raw water intake structure is relocated to an area where chloride levels will not be increased). The Corps should further ensure that the Draft Feasibility Study and DEIS are revised to include specific, independent line-items for any DO mitigation mechanism(s) selected in order

to ensure that sufficient funds for such mitigation are both authorized and appropriated by Congress as a part of its review of the Project.

C. A Final EIS is Developed by the GPA and the Corps and Published for Public Comment.

The Members believe that a final EIS that corrects the noted deficiencies should be published and subjected to public comment. If the comments of the Members, as set forth above, are not addressed in the final EIS, the Project cannot proceed on sound legal footing. More specifically, as noted above, the Corps should include specific, independent line-items in the EIS and Feasibility Study where necessary to ensure that sufficient funds are authorized and appropriated by Congress to mitigate any unavoidable adverse environmental impacts caused by the Project. To the extent that the Corps cannot provide in the EIS a detailed discussion of the costs and engineering requirements of any mitigation measures selected by the Corps to remedy the impacts of the Project, then the Corps should provide such discussion in a Supplemental EIS and make such discussion available for public review and comment.

D. The Corps Should Consult with a Technical Advisory Committee Concerning Certain Aspects of the Project Before Completing the EIS.

Before the Corps proceeds with its evaluation of the mitigation measures noted above, the Members request the establishment of a Technical Advisory Committee ("TAC") and seek to be included on such a Committee. In particular, the Members seeks to engage in a dialogue with the Corps and GPA concerning, inter alia: (1) the model used to develop the DO and salinity data relied upon by the Corps; (2) the DO mitigation/reaeration project; and (3) the chloride mitigation project, including the relocation of water-intake structures.

5. Conclusion

The Members do not write these comments in order to thwart the Corps' efforts to ensure that the Savannah Harbor remains a viable commercial port of call both now and in the future. The purpose of these comments is to assist the Corps and the Georgia Ports Authority with their consideration of reasonable alternatives and mitigation measures which will not result in a shift of the costs of maintaining the Savannah as a multi-use estuary. The Members urge the Corps and Georgia Ports Authority to explore such alternatives and measures and to include them in the Project.

Thank you again for the opportunity to comment on the April, 1998 Draft Environmental Impact Statement, Draft Feasibility Study, and related materials pertaining to the Corps' proposed dredging of the Savannah Harbor.

If you have any questions concerning the above comments, please contact James R. Baker, Savannah Harbor Committee Chair, at 912-238-7506, or write to us care of the Savannah Manufacturing Council, P.O. Box 1628, Savannah, Georgia, 31402.

Very truly yours,

Robert J. Scanlon
Chair, Savannah Manufacturing Council, and
Vice President for Corporate Affairs
Kemira Pigments, Inc.

Willis J. Potts
Senior Vice President
Kraft Paper & Board Division
Union Camp Corporation

C.F. Bogatie
General Manager
Stone Container Corporation

Arne Vorwig
Director of Engineering
E.M. Industries

Tom McAdams
Manager
Engelhard Corporation

William W. Spraig, Ill
Chief Executive Officer
Savannah Foods & Industries

cc: Charles A. Perry, Esq.
Joel Williams, Esq.
Harold J. Reheis, Director, EPD
Robert F. McGee, Director, Water Division, USEPA Region IV

[1] The Corps' estimate of the amount of DO potentially removed from the River by the Project appears to understate the actual, anticipated reduction. This understatement is derived from flaws in the Corps' DO modeling program. For example, the Corps' Savannah River model does not take ammonia or nitrogenous biological oxygen demand ("BOD") into account. By omitting certain sources of BOD from the model, the Corps has understated the amount of BOD present in the River and, as a result, has overstated the amount of DO which may be present in the River after the project is complete. This overstatement of DO, if corrected, may indicate that actual reductions in DO as a result of the Project are greater than predicted by the Corps. Thus, the Project may result in a greater violation of Georgia's water quality standard for the Lower Savannah River than otherwise predicted.

[2] It should be noted that, as of September, 1997, portions of the Savannah River contained concentrations of DO below Georgia's minimum criteria. See Report, Hydrodynamic & Water Quality Monitoring of the Lower Savannah River Estuary, July to September, 1997, App. C, Discrete QA/QC Data, ATM Synoptic Sampling Event 2, September 10-11, 1997, Lower Savannah River, at D-2-16 (noting DO concentrations as low as 0.43 mg/L at Synoptic Station SH-16). To the extent that the DEIS does not address these depressions in DO concentrations and their relationship to past or present Corps projects in greater detail, it is inadequate for purposes of NEPA. See generally infra. Section IV (discussion of DEIS non-compliance with NEPA).

[3] Based on a review of the DEIS and related materials, it is difficult to determine whether the Project will comply with Georgia's water quality standards. This difficulty is derived in large part from the Corps' failure to analyze changes in DO relative to the seasonal, instantaneous, minimum standards mandated under Georgia law. For example, a reduction of 0.5 mg/L DO would be more critical during periods of low flow and high water temperatures, when DO levels are already low. In contrast, a reduction of 0.9 mg/L would not necessarily be significant during periods of high flow and cooler temperatures, when DO resources are more abundant. On an absolute basis, however, the predicted 1 mg/L reduction in DO will, in all likelihood, violate the water quality standard for at least part of the year.

[4] For example, one member of the Harbor Committee estimates an increase in operating costs of about $500,000 per year if the chloride content in its boiler water treatment area were to increase from its current level (10 ppm) to 50 ppm. For increases beyond 50 ppm, that member would need to make significant capital expenditures ranging from $1,000,000 to $3,000,000, depending on the concentration, in order to compensate for the increase in chloride concentrations.

[5] James L. Martin, Ph.D., P.E., AScI Corporation, Review: Hydrodynamic and Water Quality Modeling of the Lower Savannah River Estuary by ATM and ASA, Prepared for the Georgia Ports Authority (July 1, 1998).

[6] Although these comments raise many of the concerns that the Members have concerning the Project, the Members reserve their rights to challenge the DEIS and EIS as being not in accordance with law for purposes of the Administrative Procedures Act ("APA"), 5 U.S.C. § 706(2) (1996), based on the Project's potential to violate state law and federal laws and regulations, including Georgia's water quality standards, the ESA, NEPA, and the Corps' own regulations.

[7] R.E. Speece, Ph.D., Supplemental Oxygenation of Savannah Harbor-Conceptual Design (July 1998).

[8] Such line-items should appear, for example, in Table 6-2 of the Draft Feasibility Study and in the Corps' cost-benefit analyses.

The undersigned agrees with the comments as submitted by the Savannah Harbor Committee:

/s/
_____
Robert Scanlon
Vice President of Corporate
Affairs
Kemira Pigments, Inc.

July 7, 1998

The undersigned joins in the submission of this letter dated July 7, 1998 from the Harbor Committee Members of the Savannah Area Manufacturer's Council regarding the Draft Environmental Impact Statement and the Draft Feasibility Study for the Proposed Expansion of the Savannah Harbor.

/s/
_____
Willis J. Potts
Senior Vice President
Kraft Paper & Board Division
Union Camp Corporation

The undersigned agrees with the comments as submitted by the Savannah Harbor Committee:

/s/
_____
C.F. "Chuck" Bogatie

General Manager
Stone Container Corporation

July 7, 1998

The undersigned joins in the submission of this letter dated July 7, 1998 from the Harbor Committee Members of the Savannah Area Manufacturer's Council regarding the Draft Environmental Impact Statement and the Draft Feasibility Study for the Proposed Expansion of the Savannah Harbor.

/s/
_____
Tom McAdams
Site General Manager, Savannah
Engelhard Corporation

The undersigned joins in the submission of the Harbor Committee of the Chamber of Commerce providing comments on the Corps of Engineers, Proposed Savannah Harbor Dredging Project,

This _7_ day of _July__ 1998

/s/
_____
William W. Sprague, III

APPENDIX A

Report from James L. Martin, Ph.D., P.E.

Review: Hydrodynamic and Water Quality Modeling of the Lower Savannah River Estuary by ATM and ASA, prepared for the Georgia Ports Authority

Exhibit 1

Review: Hydrodynamic and Water Quality Modeling of the Lower Savannah River Estuary by ATM and ASA prepared for the Georgia Ports Authority

By: James L. Martin, Ph.D., P.E.
AScI Corporation

Date: 1 July 1998

Executive Summary

Although the WQMAP modeling system applied to Savannah Harbor seems to be an appropriate framework, there are a number of questions and concerns regarding the appropriateness of certain model inputs and assumptions, particularly with regard to the dissolved oxygen DO portion of the simulation. Also, the 1997 field study period, used for calibration of the model, was wetter and cooler than normal and did not therefore include DO-critical (stressful) combinations of typical high temperatures with concurrent low flows.

Only the 1997 field-calibrated model was used to simulate DO impacts of the proposed project rather than considering critical conditions when DO resources are most limited. In order to make appropriate decisions regarding DO impacts and possible mitigation alternatives, the 1997 field-calibrated model should be revised and adjusted to simulate appropriate critical conditions.

Comments

Modeling System

1. The modeling system applied to the Lower Savannah River Estuary (WQMAP) seems appropriate for meeting the stated goals of the modeling study. The three-dimensional hydrodynamic and water quality model should adequately predict the variations in flows and water quality in the system due to the estuarine and river forcings, given appropriate model set up, boundary conditions, rates and other coefficients.

2. The model selected for application, WQMAP, appears to be comparable to other state-of-the-art three dimensional models. In addition, WQMAP includes grid generators and other supporting software which should make the model easier to implement, and potentially reduce the possibility of errors introduced in the construction of model input. The authors of the hydrodynamic code are well known. The subject reports provide an overview of the modeling structure. Supplemental material provided by ASA (1998) and from WEST (1996)
indicate the boundary-rifted hydrodynamic and pollutant transport model has been applied to over 40 sites (ASA 998, WEST 1996). Muin and Spaulding (1997a,b) described the model formulations, testing of the model against analytical solutions, and the application of the hydrodynamic model to the Providence River. However, previous applications were not evaluated as part of this review.

3. The quality model component (based on the USEPA WASP model), as described in the subject reports, and supplemental information should be adequate for the simulation of processes of importance in the Savannah River estuary.

Model Application (General Comments)

4. The calibration of the model, based upon information provided, appears to have been adequate with regard to the estuarine hydrodynamics and salinity variations.

   A) The hydrodynamic model predictions seem reasonable, particularly for lower reaches of the estuary for both water surface elevations and velocities.

   B) Salinity comparisons also appear reasonable. Although difficult to discern in black and white copies of the figures, it appears that mean (tidally averaged) salinities were reasonably captured. The maximum salinities appeared to be overestimated in the vicinity of Fort Jackson and underestimated at upper stations, particularly in the Little Back River. In the Little Back River, the peak salinities were underestimated by about a factor of two (maximum observed of 11 ppt as compared to the maximum predicted of 4.0 ppt). In subsequent conversations with ATM staff it was indicated that additional sensitivity analyses, not included in the subject reports, had been performed to determine factors affecting these predictions. The 90th percentile frequency for this station was only 3.2, indicating that these maximums occurred infrequently.

5. The intended purpose of the DO model, stated in the subject report to be a simplified application, was to estimate the system's response to the proposed deepening under different river discharge scenarios. The screening-level application should be adequate for that intended purpose. That is, the model should be adequate to approximate the response (or direction of change) that may occur between the scenarios simulated, but the estimated magnitude of that change is only applicable to the set of conditions simulated (including boundary conditions and specified kinetic rates). The uncertainty associated with the magnitude of the estimated change in DO is unknown. Different conditions and rates could produce different results, so that the magnitude of that predicted change could potentially vary considerably for other conditions.

6. For this application, a rigorous calibration of the model to DO, and factors affecting DO, was not performed, nor did there appear to be sufficient field data collected to support such an application. Loadings from various sources (some boundaries, point and non-point sources, sediments, etc.) were not quantified by the associated field studies. Rates measured and/or used in previous modeling studies were not utilized. Some processes know to have a lesser impact on DO predictions in the Savannah River Estuary (algal productivity, nitrogen transformations) were not simulated.

7. The modeling structure should be adequate to address other intended purposes or issues. However, the specific purpose of the application would affect the manner in which it is applied. The application of the model to other intended purposes may require a more detailed field and model application in order to estimate site-specific values of rates used in the model and to assess the accuracy of model predictions. For example, if the study purpose was to assess the impact of loads on instantaneous DO values (rather than statistical averages, as in the subject application) for comparison with DO standards, or to identify critical conditions affecting DO, a different field and modeling approach should have been used.

8. A sensitivity analysis should be performed with the existing model to estimate the impact of the uncertain coefficients on model predictions to provide some bounds on those predictions, for the conditions simulated. A sensitivity analysis could also be performed to estimate the impact of other, potentially more critical conditions, such as those previously observed to have resulted in a more severe DO depletion that was observed in this study.

Specific Comments

9. The coefficients and forcings (boundary conditions, etc.) used in the model application were primarily literature values. In some cases, the values used were not specified in the subject report, so that their potential impact could not be evaluated. Some of these values were determined in subsequent meetings with ATM staff. However, The use of literature values rather than site specific data makes the model predictions uncertain, particularly for model projections of dissolved oxygen, which is influenced by a variety or processes.

10. Loads were specified based upon monthly averaged data from the EPA Discharge Monitoring Repots (DMRS) filed with the EPD by the NPDES permit holders. It seemed from the report that the BOD_u data from the DMRs was used to compute loadings, so that the f-ratios used to convert from BOD_5 to BOD_u were literature values, rather than the available site-specific data. However, the report implies that measured BOD_u values were used for the period. It was not clear from the subject report which is the case. In subsequent meetings, it was determined that the literature values (f ratios) were used in the model simulations, rather than available site-specific data.

11. The subject report indicates that CBOD and dissolved oxygen concentrations were prescribed for inflows, but the values used were not specified in the subject report and their potential impact on model predictions could not be assessed. Previous studies by the Georgia EPD indicated that the upstream boundary impacted down-stream reaches. The Georgia EPD indicated that 90 % of these boundary loadings will flow into the down-stream study area. In subsequent meetings with ATM it was determined that measured values of BOD and DO were applied for inflows.

12. The report states that the salinity, BOD_u and dissolved oxygen concentrations during the ebb flow (inflow from the storage areas) from the extensive marsh areas were prescribed, but the values used were not specified and therefore could not be assessed. Previous studies by the Georgia EPD indicated that the marsh areas are generally in equilibrium and do not directly affect water quality in the study area. Previous studies note an exception is the inland marsh of the Savannah National Wildlife Refuge, where dissolved oxygen concentrations during ebbing flow were substantially reduced over those into the marsh during the flood. In subsequent meetings, ATM staff indicated measured values were used at the marsh boundaries.

13. For $CBOD_u$, and dissolved oxygen, the subject report indicates that open (ocean) boundary conditions were set to prescribed values during inflow. The values used were not specified, so their potential impact could not be assessed. Previous studies by the Georgia EPD suggested the importance of the open boundary condition, and indicated that if the open boundary BOD_u equals 3.0 mg/l, then about 2.5 million pounds of BOD_u, could be loaded to the system each day. In subsequent meetings, ATM staff indicated that DO was assumed to be saturated and BOD was determined by calibration for the open boundary. This boundary, and its impact on predictions, would then be very uncertain, given the uncertainty in the other loadings.

14. The deoxygenation rate specified for BOD deoxygenation ("decay") was 0.04 day^{-1}. This value seems generally consistent with values measured in Table 9-1 of the monitoring report, but varies considerably from values used in previous modeling studies by the Georgia EPD of 0.1 day^{-1}. Previous modeling studies also simulated NBOD as well as CBOD, with deoxygenation rates for NBOD of 0.07 to 0.08. The Georgia EPD also noted an immediate oxygen demand term in their previous studies.

15. The subject report indicates a constant sediment oxygen demand (SOD) was specified for the entire model domain of 1.0 g m^{-2} day^{-1} (Table 5.2). In subsequent meetings, it was determined that the value was varied from 1.0 to 1.5 g m^{-2} day^{-1}. In previous studies, the Georgia EPD collected SOD measurements at 8 stations within the study area, with values ranging from below 1.0 to around 2.0. The highest measured values were near inland freshwater marsh areas in Middle and Little Back rivers (near 3.5 g m^{-2} day^{-1}). Lowest values occurred in the Back River above the tide gate and the main channel of the Savannah River inland to Ebenezer Landing, with values of about 0.5 g m-2 day-1. The Georgia EPD measured SOD values were 1.6-1.7 g m^{-2} day^{-1} in the north and south channels, while values determined by model calibration were 1.75-2.25 g m^{-2} day^{-1}. SOD rates determined by the USACOE and used by Hall (1987) in the application of CE-QUAL-W2 to the estuary varied from 1.2 to 2.9 g m^{-2} day^{-1}. It is not known if these measurements reflect present conditions or what the potential SOD would be in the sediments exposed during the channel deepening.

16. A diffusive exchange coefficient of 2.5 X 10^{-4} m^2 day^{-1} was specified. It is not clear in the subject report how this rate (approximately molecular diffusion) was used, or how it may impact model predictions. In subsequent meetings with ATM, it was determined that this was a pore water diffusion rate and was not used in predictions.

17. A reaeration rate of 2.5 day^{-1} was specified, as stated in the subject report, rather than using one of the alternative methods included in the model to compute the rate. The O'Connor-Dobbins formulation was used to compute reaeration rates in previous modeling studies, but the computed rates are not known and can not be compared to the specified value. In subsequent meetings with ATM, it was determined that the value was specified since it was not clear which combinations of depths and velocities should be used in formulations for computing reaeration.

18. Photosynthesis and respiration rates were not specified. These rates were used in previous modeling studies but were considered to be minor components of the total oxygen dynamics, as suggested in this study.

19. Ammonia or nitrogenous BOD (NBOD) were not included in simulations, although they were in previous modeling studies.

20. No comparisons were provided in the subject report for predicted BOD concentrations, for either a quantitative or qualitative evaluation. In subsequent meetings, it was indicated that at least qualitative comparisons of BOD predictions were made, and open boundary conditions (rather than loads) adjusted to obtain a qualitative agreement.

21. The dissolved oxygen model predictions were not compared to observed time-varying data in the subject report, as were salinity predictions. Instead, model predictions were compared to selected percentile frequencies similar to comparisons provided in tables for salinity. No statistical comparisons were provided (means, maximum, minimum, standard errors, etc.) as for salinity predictions. The comparisons between model predictions did seem to exhibit a reasonable degree of accuracy, in comparison with mean values, given that this is a simplified application, as indicated in the report. Typically, the median relative error of detailed dissolved oxygen model applications is on the order of 10 %, or about 0.5 mg/L. The relative error associated with a screening level study, such as performed for this project, would be expected to be considerably greater.

22. It is not known if the conditions to which the model was calibrated and applied represent critical conditions for the estuary. Conditions measured by the Georgia EPD in 1989 and 1990 (EPD

1990, 1991) indicate pockets of low DO water over relatively large areas. Unlike a riverine system, the critical conditions may not be those with the lowest flow, but rather those that may tend to trap low DO water, or oxygen demanding materials, in certain areas, such as was observed in 1989 and 1990.

23. The model was calibrated to percentile frequencies, rather than absolute values. Therefore, it appears to have been calibrated to represent average rather than extreme conditions. For example, tidally averaged observations (Table 4-2) at the 10 percentile frequency were generally above 3.0 mg/L, while instantaneous values (e.g. Figure 4-6-7) of less than 2.0 mg/l were observed. The applicable DO standards are instantaneous values, rather than averages.

24. The temperature conditions used in the application of the dissolved oxygen model were not specified in the subject report. During subsequent meetings, it was determined that temperature was specified, based upon field data collected as part of this study, and not simulated.

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PROTECTION OF INSTREAM DISSOLVED OXYGEN

Decisions about instream dissolved oxygen (DO) protection, including: water quality criteria, NPDES permit limits and State Water Quality Certifications are appropriately made by considering DO impacts at DO-stressful ("critical") conditions. Critical conditions typically include specified water temperatures, stream flows, segment boundary conditions and (for tidal segments) tide ranges.

The normal approach for considering the DO impact of a proposed action is to construct and calibrate an appropriate water quality model using field data that are as close to DO-critical conditions as possible. Next, the "field-calibrated model" is adjusted to simulate selected combinations of critical conditions. This critical-conditions model" is then used to predict the water-quality impact of proposed actions-

In the DEIS for the proposed Harbor expansion, there are no critical conditions DO simulations. The DO impact of the proposed project is evaluated only within the context of the 1997 field-calibrated model which is not representative of critical conditions for DO. This lack of critical conditions DO projections for the proposed project is a significant shortcoming that needs to be addressed in order to reasonably consider DO impacts and potential mitigation measures as part of the project.

Georgia EPD has previously assumed a DO-critical water temperature of 300C for Savannah Harbor with a 7Q 10 low flow for August (assumed to be the hottest month) at the Clyo gage. (EPD _____). Figure 1 presents average (2-year return) and extreme (10-year and 25-year return) seasonal highs of daily average air temperatures at the Savannah Airport for 1-day to 21-day durations. Figure 2 compares the 7-day moving average of daily air temperatures in Savannah during the 1997 DEIS field sampling period to the 7-day duration daily air temperature statistics for long-term record (1954-1997). Figure 2 indicates that daily air temperatures during the 1997 sampling period were well below (5 to 150F below) the average (2-year return) and extreme (10-year return) expected high temperatures. During September 1997, when special regulated low-flow conditions were arranged, the air temperatures in Savannah, already well below seasonal norms, were rapidly decreasing. This rapid decrease temperature decrease in September 1997 was reflected in the water temperature data reported in the DEIS. The rapid
decrease in temperatures during the 1997 study period raises concern that vertical mixing may have been impacted by transient temperature-induced density gradients that would not exist during critical high temperature conditions.

Georgia's instream DO criteria are applicable for all streamflows exceeding the 7Q1O low flow except for flow-regulated stream segments where the DO criteria are applicable for all flows. While the Savannah River is definitely a regulated segment downstream from Clark Hill Dam, EPD has previously used the August 7Q1O low flow as a DO-critical low flow condition for Savannah Harbor. Using the period of streamflow record (Clyo gage) from 1954 (after Clark Hill Dam was operating) through 1997, low-flow frequency analyses were conducted. Figure 3 depicts seasonal (May-October) low flows for normal (2-year return) and extreme (10-year and
20-year) low-flow conditions as well as the "period of record" extreme low flows recorded at the Clyo gage. The record daily low flow is 4400 cfs (July 22, 1988) and the seasonal (May-October) 7Q1O is 5,300 cfs-

Figure 4 compares the 7-day moving average of daily streamflow at the Clyo gage during the 1997 DEIS field sampling period to the 7-day duration low-flow statistics. In July and August of 1997, streamflows were significantly higher than normal low-flows. But as a result of special release

arrangements at Clark Hill Dam, 7-day average flows were intentionally held at, or slightly below, the August 7Q10 of 6050 cfs for approximately two weeks in September 1997 to create a critical low-flow condition. One possible concern with this created low-flow condition is the water quality "memory" of the system related to higher flows immediately preceding the special low flow conditions of September.

As for critical tide conditions, EPD has previously assumed that Spring tides are the most DO-stressful tides because higher high tides push saline water further upstream and thereby reduce DO saturation concentrations. While this may be the case, it would be prudent to evaluate both Spring tides and Neep tides to be certain that density-induced DO gradients are properly considered.

Figure 1
Savannah International Airport
High Temperature Reference Frame May-October Season
Period of Record 1954-1997

This figure was a graph showing how the Daily Average Temperature varied with Duration.

Figure 2
Daily Average Air Temperature from the Savannah
International Airport, Savannah, Georgia Comparison of 1997 7-Day
Moving Average to
7-Day High Temperature Statistics
Period of Record 1954-1997

This figure was a graph showing how the Air Temperature varied with Month.

Figure 3
Savannah River at Clyo Gage
Low Flow Reference Frame May-October Season
Period of Record 1954-1997

This figure was a graph showing how Flow varies with Duration.

Figure 4
Mean Daily Streamflow Savannah River at Clyo Gage
Comparison of 1997 7-Day Moving Average to
7-Day Low Flow Statistics
Period of Record 1954-1997

This figure was a graph showing how Flow varied with Month.

Exhibit 2

CONCEPTUAL DESIGN

Prepared by Dr. R. E. Speece
Vanderbilt University
July 2, 1998

BACKGROUND

Natural reaeration of water bodies is directly related to turbulence at the air/water interface and inversely related to depth of the water column. Savannah Harbor is characterized by a pooled, flat water surface with little turbulence except for tides. Natural reaeration is currently affected by the 42-ft navigation channel. Plans to deepen the harbor to 50 feet will further reduce dissolved oxygen (DO) conditions in the Lower Savannah River because of the effect depth has on reaeration.

Supplemental oxygenation could mitigate the reduction in DO due to the proposed channel deepening. Examples of installations in the United States where supplemental oxygen is presently used include:

1. **Richard B. Russell Reservoir on the Savannah River:** bubble diffusers have been in operation for a number of years that have the capacity to add up to 100 tons of pure oxygen per day (tons/day). Oxygen is injected into fine bubble diffusers and is efficiently absorbed within the hypolimnion in the free rising bubble plume because of the 140-ft depth.

2. **Tombigbee River:** two supplemental oxygen installations are operated to mitigate a oxygen sag downstream of two industrial discharges. These installations pass water down 175-ft U-Tube shafts. Pure oxygen is injected at the inlet and is carried down to the high hydrostatic pressurization region at the bottom and then back to the water surface. These two systems can dissolve 30 tons/day in a side stream of about 140 MGD containing 50 mg/L of DO in the effluent which is diffused back to the river. These systems had a capital cost of approximately $12,000,000.

3. **California Lake:** this supplemental system utilizes a "Speece Cone" which pulls water from the bottom, passes it down through an inverted cone maintained with an oxygen bubble swarm which raises the DO concentration to 100 mg/L with the cone sitting on the bottom at 100 feet. The highly oxygenated water is then discharged through a diffuser on the bottom of the lake. This California application can supplement 9 tons/day.

4. **Lake "Soaker" Systems:** this application utilizes plastic tubing similar to the porous hose used in gardens. It is strung along the lake bottom on a support system which includes weights at regular intervals to anchor the hose and buoyancy chambers to keep it suspended off the lake bottom. Pure oxygen is forced into the system and permeates the porous tubing to form a source of small diameter bubbles which rise freely to the surface. Oxygen absorption efficiency is determined by the depth of the water column through which the oxygen rises. When used in lakes with depths exceeding 100 feet, 90 percent absorption is possible. In a 50-ft water column, oxygen absorption could be as much as 70 percent if the alpha factor was one and the water had low salinity and was cold. Fine bubble systems are more adversely affected by a reduced alpha factor than are the U-Tube or cone applications. Under saline conditions, warm water temperatures (30^0 F), 50-ft depths, and an alpha factor less than one, a "soaker"

tube installation for the Savannah Harbor was estimated by a vendor to have an efficiency in the range 65 percent.

Economics favor the use of pure oxygen versus air because the cost of electricity to dissolve a ton of oxygen from air is more than the cost of pure oxygen if the DO target in the side stream exceeds 4 to 5 mg/L. This greatly minimizes the required flow rate in the side stream to produce a given amount of oxygen per day.

FEASIBILITY OF SUPPLEMENTED OXYGENATION FOR SAVANNAH HARBOR

There are two main aspects to oxygen supplementation of a water body -- the oxygenation device itself and the distribution/mixing of the highly oxygenated side stream within the water body. Although Savannah Harbor represents a different configuration than the examples of other installations listed above, the tidal excursions in Savannah Harbor are exceptionally beneficial for distribution/mixing of the oxygenated water. Tidal excursions allow for the installation of a number of fixed oxygenation devices several miles apart and could provide for relatively uniform distribution of the supplemented oxygen. Fewer, larger oxygenation devices also allow for economy scale.

OXYGENATION DEVICES

Oxygen, even pure oxygen, is relatively insoluble and requires special care in the design of an oxygenation device that will achieve efficient oxygen absorption. The efficiency of absorption is key because the cost of pure oxygen is significant ($100/ton). Nominally, oxygen bubbles must be retained in water contact for about 60 to 100 seconds to achieve 80 to 90 percent absorption. There are three devices that have proven to be capable of efficient oxygen absorption: the U-Tube system, the Speece Cone, and "soaker" bubbler systems.

U-Tube Oxygenation System

This system incorporates the passage of oxygen bubble/water mixture down a deep shaft (e.g., about 200 feet) and back to the surface. The prolonged bubble contact time and the hydrostatic pressurization at depth achieve efficient oxygen absorption and very high DO concentrations in the discharge.

Speece Cone

This system incorporates a downward flow of water through an expanding cone. The high inlet velocity prevents the oxygen bubbles from escaping at the top as well as providing turbulence to generate a bubble swarm with exceptionally high oxygen/water interfacial area to enhance the oxygen transfer rate. As the cone expands, the downward water velocity decreases to the point where it is less than the buoyant velocity of the bubbles. Thus, they cannot escape out the bottom and are effectively "trapped" in the cone to enable efficient oxygen absorption efficiency. The DO in the discharge is proportional to the hydrostatic head inside the cone. At 100 feet of pressure depth inside the cone, the effluent DO can be 100 mg/L. At ambient pressure in the cone, the effluent DO would be about 25 mg/L. Therefore, it is advantageous to operate the cone as deep as possible.

"Soaker" Tubing System

This system utilizes porous tubing that would be located in the deepest water possible (e.g., the navigation channels of Savannah Harbor). Vendor-provided sizing information assumes that 3 pounds of oxygen can be dissolved per linear foot of tubing per day at 65 percent oxygen absorption

efficiency. Based on that vendor-provided information, the bubbler system would require approximately six miles of tubing in the navigation channel. Drawbacks of this system in a harbor system are related to potential encounters with shipping activity (e.g., anchoring) and annual maintenance dredging activities. The anchoring system would have to be designed to withstand strong currents and the tubing would have a typical life span of only two to four years.

SYSTEM REQUIREMENTS AND COMPARISONS

Preliminary calculations indicate that 50 tons per day would be required to mitigate the DO reduction predicted for the proposed harbor expansion project. This requirement could be met with two U-Tube systems consisting of a 7-ft. diameter concentric pipe inside a 10-ft. diameter shaft 200 feet deep. A flow of 150 MGD would be withdrawn from the harbor by a 500 hp pump through the new intake structure. Pure oxygen would be injected at the top of the 7-ft. diameter pipe and the oxygen bubble/water mixture would flow down to the bottom and back to the surface in the outside annular area. The discharge containing over 40 mg/L of DO would be discharged into the harbor. (Salt water has a lower DO saturation than fresh).

The estimated capital costs for two 25-tons per day U-Tube systems would be $24,000,000 based on capital costs for the Tombigbee River system. High capital costs are related to the intake and diffuser structures that will be required to place the U-Tube system on the shore adjacent to the harbor.

Operating costs are primarily the cost of the pure oxygen which was estimated at $100 per ton or $5,500 per day based on a 90 percent oxygen absorption efficiency. Assuming oxygen supplementation would be required, on average, 100 days per year, annual oxygen costs would be approximately $550,000.

Alternatively, a Speece Cone could be utilized by anchoring cone(s) to pile supports outside the navigation channel. These devices would consist of a cone 25 feet high and 20 feet in diameter at the bottom. Water would be drawn from the harbor and forced down into the top of the cone where pure oxygen will be injected. A 200 hp pump would move 50 MGD of water through the cone. The discharge DO concentration would depend on the water depth at which is operates. If the cone sat in 50 feet of water, the discharge DO would be about 50 mg/L. Such an installation could add 10 tons/day. If the cone is in 25 feet of water, the discharge DO would be proportionately reduced and proportionately more water would have to be pumped through a larger installation to supplement 10 tons per day.

The discharge port at the bottom of the cone would be directed perpendicular to the harbor channel at a discharge velocity of about 20 fps so that momentum of the jet would carry the oxygenated water to the opposite side of the navigation channel. Longitudinal mixing along the navigation channel would be through tidal excursions.

Five of these cones installed at regular intervals along the 15-mile harbor would be required to meet the estimated 50 tons/day. If a 90 percent oxygen absorption efficiency was achieved then 55 tons/day would be required. It was estimated that the total capital costs for five oxygenated cones would less than half of the $24,000,000 estimated for the two U-Tube systems.

A "soaker" tubing system that would provide 50 tons/day would require about six miles of tubing. Based on a 65 percent oxygen absorption efficiency, 75 tons/day would be required to meet the 50 tons/day target.

The present worth of the oxygen at 8% and for 25 years would be a multiplier of 10.7. Therefore, the present worth for oxygen for the U-Tube and Speece Cone would be 10.7 x $550,000/yr = $5,900,000. For the bubbler it would be 10.7 x $750,000 = $8,000,000. If the bubbler had a capital cost of $2,500,000 for a six mile long system and had to be replaced every four years, the annual cost could be .22 x $2,500,00 = $550,000 per year, with an equivalent present worth of 10.7x $550,000 = $5,900,000.

Overall comparison of the three supplemental oxygenation systems.

U-Tube	**Cone**	**Bubbler**
Equipment on Land	Equipment in harbor outside of navigation channel	Equipment within navigation channel
No impacts to shipping	No impacts to shipping	Potential impacts to shipping
Dredging not impacted	Dredging not impacted	Potential impacts from annual dredging
25 year life	25 year life	2-4 year life
90 percent oxygen absorption efficiency	90 percent oxygen absorption efficiency	65 percent oxygen absorption efficiency
Anchoring will not impact system	Anchoring will not impact system	Anchoring may impact system
Two installations over 15 miles of channel	Five installations over 15 miles of channel	Six miles of tubing over 15 miles of channel
Oxygen present worth $5,900,000	Oxygen present worth $5,900,000	Oxygen present worth $8,000,000
System present worth $24,000,000	System present worth <$12,000,000	System present worth $ 5,900,000

Letter response

SAVANNAH AREA CHAMBER OF COMMERCE
222 West Oglethorpe Avenue, Suite 100
Savannah, Georgia 31401
P.O. Box 1628

Date: July 7, 1998

1. COMMENT: At the outset, the Harbor Committee of the Savannah Manufacturers' Council wish to stress that it is not our intention to compromise this harbor deepening project. Rather we have identified a number of concerns that we believe can and must be addressed to ensure that the integrity of the Harbor is protected and that the other users of this resource are not left with the responsibility of mitigating any impacts that the Project may have on the Savannah River.

RESPONSE: Savannah District wrote the Chamber of Commerce on June 22, 1998 to inform them that the District had extended the review period until July 7, 1998.

2. COMMENT: Comments Summary -- The Project is projected to lower concentrations of DO in affected areas of the Savannah River to concentrations below those permissible under Georgia law. In addition, the Project's reduction of DO concentrations violates anti-degradation principles central to GA's, SC's, and federal regulatory schemes designed to protect water quality. The Project is also predicted to increase salinity levels in the River in a manner that will substantially and negatively impact the undersigned. Further, the Corps' use of river modeling with respect to Project impacts on DO and salinity levels contain numerous deficiencies. Finally, the Corps' discussions of the Project and Project impacts do not comport with the requirements of NEPA, and its implementing regulations. The Members believe that certain mitigation measures can be implemented which will not only alleviate the negative impacts of the Project but may also provide the basis for further enhancing overall water quality in the Savannah River in the future. The Members believe that the Project should proceed only if cost estimates for such mitigation measures are properly included in the Final Feasibility Study and a commitment to develop a Tier II EIS is included in a final EIS that responds to the Members' many concerns.

RESPONSE: Review of the Salinity and Dissolved Oxygen Model has been done by experts representing the United States Fish and Wildlife Unit (Salinity), the Environmental Protection Agency (Salinity and Dissolved Oxygen), as well as James Martin of ASCI for the local industries and the Chamber of Commerce (Salinity and Dissolved Oxygen). The United States Fish and Wildlife representative has agreed that the salinity model as presented in the EIS is sufficient for evaluating the project impacts. The EPA representative has identified that both the salinity and dissolved oxygen model is sufficient for evaluating the project impacts. James Martin in a meeting identified that the salinity model as applied is sufficient for evaluating the project impacts. He also agreed that the model is an appropriate tool for evaluating the impacts to dissolved oxygen but he feels that certain simplifying assumptions in the application of the model are not sufficient. Additional refinements to the dissolved oxygen model are to be completed within the CED phase and will be reported within the Tier II EIS to be completed during the CED phase. Additionally measurements made in the Summer of 1997 identify that the system at present

violates the state standard of a dissolved oxygen concentration not less than 3.0 mg/L at any time.

3. COMMENT: State and Federal Laws Implicated by the DEIS -- Expanding the Savannah Harbor as proposed in the DEIS does not comply various state and federal statutes, as well as the Corps' own regulations governing such projects.

RESPONSE: The EIS complies with all regulatory requirements.

4. COMMENT: The Project Predicts Violations of State DO Criteria -- Pursuant to the Georgia Water Quality Control Act, Georgia has promulgated regulations intended to enhance water quality and prevent pollution. Pursuant to these regulations, Georgia currently classifies the portion of the Savannah River running from the Seaboard Coastline Railroad Bridge (River Mile 27.4) to Fort Pulaski (River Mile 0) as a "Coastal Fishing" area. Pursuant to those regulations, DO in the above-referenced portion of the Savannah River may be "no less than 3.0 mg/L in June, July, August, September, and October; not less than 3.5 mg/L in May and November; and no less than 4.0 mg/L in December, January, February, March and April." The regulations note that the DO criteria for that portion of the Savannah River are instantaneous minimums.

RESPONSE: No response necessary.

5. COMMENT: GPA's hydrodynamic model predicts that the Project will reduce concentrations of DO present in affected areas of the Savannah River in an amount up to 1 mg/L. According to the DEIS, the proposed dredging to a depth of 50 feet in the Front River "and, consequently higher stratification, [will] cause local reduction in the overall water column reaeration due to a reduced vertical mixing and increased distance from the bottom layers to the surface." The DEIS also notes that in the 50th percentile DO impacts increase between River Miles 12 and 20.5 to a maximum impact of 0.9 mg/L at the highest estimated flow rate; ninetieth percentile impacts indicate a reduction in DO concentrations of up to 1 mg/L near River Mile 17.

RESPONSE: No response necessary.

6. COMMENT: The predicted reduction in DO concentrations may cause the affected areas of the Savannah River to drop below the minimum DO concentrations established by the State of Georgia. Because the Project may reduce DO concentrations in violation of Georgia's water quality standards, the Corps should reevaluate its proposed dredging plans in order to ensure compliance with such standards.

RESPONSE: In order for the project to proceed a 401 certification will need to be issued which evaluates the project impacts upon the water quality regulations of the State of Georgia. In addition, the project will mitigate for DO impacts caused by the deepening.

7. COMMENT: The Project Violates State and Federal Anti-Degradation Principles The Project, by reducing DO concentrations below those permitted under Georgia law, violates that State's anti-degradation mandate. In addition, because the Project will, inter alia, degrade the quality of the

Savannah River in terms of DO, the Project violates the anti-degradation principles of the South Carolina Pollution Control Act, and of the Federal Water Pollution Control Act.

RESPONSE: In order for the project to proceed a 401 certification will need to be issued which evaluates the project impacts upon the water quality regulations of the State of Georgia. In addition, the project will mitigate for DO impacts caused by the deepening.

8. COMMENT: The Project May Result in a Harmful Increase in Chloride Levels in the Lower Savannah River -- One significant side effect of the Project's predicted increase in salinity involves the resulting increase in chloride present in certain portions of the Lower Savannah River. According to the DEIS, the Project will, in all likelihood, cause chloride levels to increase proximate to the City's raw water intake, located on a tributary of the Savannah River located approximately 8 miles upstream of the harbor project limits. Any increase in the fresh water chloride content will have a significant economic impact on all industrial users.

RESPONSE: In the EIS it is identified that evaluation of existing data were unable to quantify whether or not the proposed project would create increases in the chloride concentrations at the City of Savannah Raw Water Intake. Presently a Plan of Study has been presented to the City of Savannah for review. This Plan of Study identifies a methodology for evaluating the potential increases in chloride concentration at the Cities Raw Water Intake due to the proposed project. Upon acceptance this study is to be implemented within the CED phase of the project and the results presented in the Tier II EIS.

9. COMMENT: An increase in chloride concentrations will result in increased corrosion, a higher rate of equipment failure, and product quality problems at the plants of certain stakeholders. Any facility which emphasizes the re-use of process water will be placing itself at greater risk of economic harm when including non-process-elements, including additional chlorides, in its processes. Regrettably, the economic analysis fails to address the above or similar costs to stakeholders who use I&D water for boilers or for the direct processing of products.

RESPONSE: The EIS will be revised to include further studies of the cause and effect relationship between salinity increases from the project and chloride levels at the City's water intake. The project will also include costs for the potential mitigation efforts resulting from an increase in chlorides. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

10. COMMENT: The DEIS attempts to downplay the significant impact that increased concentrations of chloride will have on I&D water systems by suggesting that affected intakes can be moved or that the flow rate into such intakes can be artificially increased. In its Comments to the Corps on the Project, however, the City estimates the cost of water intake relocation to be approximately $46 million. The substantial amount of money required to compensate for the predicted change in chloride concentrations warrants additional attention in the EIS.

RESPONSE: The $46 million dollar maximum cost to mitigate for potential impacts to the water quality at the City of Savannah Raw Water Intake has been factored into the project. A Plan of Study that presents a study to quantify the project impacts to Chloride Levels at the City of Savannah Raw Water Intake has been presented to the City for review. Upon acceptance of this plan of Study work will commence in the CED phase of the project. The results of this study will be presented in the Tier II EIS.

11. COMMENT: If use of Savannah River water becomes less feasible, additional pressure may be brought to bear on underground water sources. The Corps should seek to avoid placing such pressure on such valuable, limited resources.

RESPONSE: The DEIS addresses the value of the regional water supply sources. The City is already limited on the amount of groundwater withdrawals available for supply.

12. COMMENT: The Corps' Letter response of the Project does not Comply with NEPA and its Implementing Regulations -- NEPA requires that agencies of the federal government include in proposals for "major Federal actions significantly affecting the quality of the human environment a detailed statement" of, among other things: (1) the environmental impact of the proposed action; (2) any adverse environmental effects which cannot be avoided should the proposal be implemented; and (3) alternatives to the proposed action. Such agencies must also "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources."

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

13. COMMENT: Comments -- The April, 1998 DEIS prepared by the Corps is insufficient for purposes of NEPA because, among other things,

(1) the Corps fails to adequately discuss the environmental impacts of dredging to depths other than to the Corps-recommended 50-foot depth,
(2) the Corps fails to identify any adverse environmental effects which cannot be avoided should the proposal be implemented, or which could be avoided through dredging to depths other than to 50 feet;
(3) the Corps fails to state that its recommended alternative will, in all likelihood, violate the law of the State of Georgia;
(4) the Corps fails to discuss DO or salinity concentrations at depths other than 50 feet;
(5) the Corps does not adequately discuss the impacts of the Project on the shortnose sturgeon and striped bass;
(6) the Corps has not conducted any studies of alternatives to its recommended 50 foot dredging depth which might resolve conflicts related to the existing, competing uses of the natural resources of the Savannah River;
(7) the Corps has failed to consider any mitigation measures related to the projected increase in salinity and decrease in DO for any of the alternatives;
(8) the Corps has failed to identify reasons why it selected the 50 foot depth alternative when the greatest benefits versus costs appear at a depth of 46 feet;
(9) as more fully set forth in Paragraph D, above, flaws in the Corps' model prevent the Corps from providing an accurate statement concerning the Project's environmental impacts;
(10) given the Project's scope and complexity, the Corps has failed to provide sufficient time for the public to comment on the DEIS; and

(11) given the Project's scope, complexity, and significant environmental impacts, the Corps, as a general matter, has not conducted sufficient information gathering for the DEIS to meet NEPA's "detailed statement" requirement.

RESPONSE:

13.1 The proposed scope of the DEIS was stated as a "worst case scenario" addressing the potential impacts of the deepest alternative, a 50 foot channel. All other alternative project depths would have less impact. Additional studies will be performed in the CED phase to evaluate alternative depths.

13.2 Additional studies will be performed in the CED phase to evaluate alternative depths.

13.3 The EIS complies with all regulatory requirements.

13.4 Additional studies will be performed in the CED phase to evaluate alternative depths.

13.5 The project provides full disclosure of potential adverse impacts to these species, especially impacts from DO decrease and salinity increase, as well as proposals for avoiding these impacts.

13.6 Additional studies will be performed in the CED phase to evaluate alternative depths.

13.7 The DEIS considers a number of avoidance, minimization, and mitigation features. In addition, studies in the CED phase will be used to develop a final mitigation plan.

13.8 The DEIS will be revised to present the LPP.

13.9 Review of the Salinity and Dissolved Oxygen Model has been done by experts representing the United States Fish and Wildlife Unit (Salinity), the Environmental Protection Agency (Salinity and Dissolved Oxygen), as well as James Martin of ASCI for the local industries and the Chamber of Commerce (Salinity and Dissolved Oxygen). The United States Fish and Wildlife representative has agreed that the salinity model as presented in the EIS is sufficient for evaluating the project impacts. The EPA representative has identified that both the salinity and dissolved oxygen model is sufficient for evaluating the project impacts. Additional refinements to the dissolved oxygen model are to be completed within the CED phase and will be reported within the Tier II EIS to be completed during the CED phase.

13.10 A 15 day extension to the comment period was provided.

13.11 The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

14. COMMENT: If finalized, the DEIS, as currently presented, would undoubtedly be deemed by any reviewing court to be arbitrary, capricious, or otherwise not in accordance with the law.

RESPONSE: The EIS has been revised to address these concerns.

15. COMMENT: Actions Needed -- For all of the reasons set forth above, the Project, as proposed, should not go forward. The Members can, however, support the Project if the following actions are undertaken by the Corps and GPA:

A. Mitigation measures are undertaken to eliminate the predicted DO deficit. It should be noted that although the Members recommend the most expensive of the suggested mitigation mechanisms, the Corps should investigate and consider all reasonable alternatives in a manner consistent with NEPA as a part of its Final EIS. The Corps should further ensure that the Draft Feasibility Study and DEIS are revised to include specific, independent line-items for any DO mitigation mechanism(s) selected in order to ensure that sufficient funds for such mitigation are both authorized and appropriated by Congress as a part of its review of the Project.8

B. Mitigation measures are undertaken to avoid the negative effects of increased chloride levels. The Draft Feasibility Study and DEIS should be revised to include specific, independent line-items for any DO mitigation mechanism(s) selected in order to ensure that sufficient funds for such mitigation are both authorized and appropriated by Congress as a part of its review of the Project

C. A Final EIS is Developed by the GPA and the Corps that corrects the noted deficiencies and Published for Public Comment. More specifically, as noted above, the Corps should include specific, independent line-items in the EIS and Feasibility Study where necessary to ensure that sufficient funds are authorized and appropriated by Congress to mitigate any unavoidable adverse environmental impacts caused by the Project

D. The Corps Should Consult with a Technical Advisory Committee Concerning Certain Aspects of the Project Before Completing the EIS.

RESPONSE:

A. The EIS will be revised to provide mitigation of project impacts on dissolved oxygen levels in the Savannah Harbor. The estimated costs of mitigation have been included in the project costs.

B. The EIS will be revised to provide mitigation of project impacts on chloride levels at the City's water intake and dissolved oxygen levels in the Savannah Harbor. The estimated costs of mitigation have been included in the project costs.

C. The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

D. The EIS has been revised to provide a mitigation process which includes participation by various stakeholders.

16. COMMENT: Conclusion -- The Members do not write these comments in order to thwart the Corps' efforts to ensure that Savannah Harbor remains a viable commercial port of call both now and in the future. The purpose of these comments is to assist the Corps and GPA with their

consideration of reasonable alternatives and mitigation measures that will not result in a shift of the costs of maintaining the Savannah as a multi-use estuary. The Members urge the Corps and GPA to explore such alternatives and measures and to include them in the Project.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

Review: Hydrodynamic and Water Quality Modeling of the Lower Savannah River Estuary by ATM and ASA

Executive Summary

17. COMMENT: Although the WQMAP modeling system applied to Savannah Harbor seems to be an appropriate framework, there are a number of questions and concerns regarding the appropriateness of certain model inputs and assumptions, particularly with regard to the dissolved oxygen DO portion of the simulation. Also, the 1997 field study period, used for calibration of the model, was wetter and cooler than normal and did not therefore include DO-critical (stressful) combinations of typical high temperatures with concurrent low flows.

RESPONSE: Additional refinement of the dissolved oxygen model is proposed for the CED phase of the project. This work will be performed in cooperation with local industrial stakeholders. Model inputs and evaluation criteria will be refined and the results of the revised model will be presented in the Tier II EIS.

18. COMMENT: Only the 1997 field-calibrated model was used to simulate DO impacts of the proposed project rather than considering critical conditions when DO resources are most limited. In order to make appropriate decisions regarding DO impacts and possible mitigation alternatives, the 1997 field-calibrated model should be revised and adjusted to simulate appropriate critical conditions.

RESPONSE: Appropriate critical condition simulations will be performed under the CED phase of the project. The results of this work will be presented within the Tier II EIS

Comments

Modeling System:

19. COMMENT: The modeling system applied to the Lower Savannah River Estuary (WQMAP) seems appropriate for meeting the stated goals of the modeling study. The three-dimensional hydrodynamic and water quality model should adequately predict the variations in flows and water quality in the system due to the estuarine and river forcings, given appropriate model set up, boundary conditions, rates and other coefficients.

RESPONSE: No response necessary.

20. COMMENT: The model selected for application, WQMAP, appears to be comparable to other state-of-the-art three dimensional models. In addition, WQMAP includes grid generators and other supporting software which should make the model easier to implement, and potentially reduce the possibility of errors introduced in the construction of model input. The authors of the hydrodynamic code are well known. The subject reports provide an overview of the modeling structure. Supplemental material provided by ASA (1998) and from WEST (1996) indicate the boundary-rifted hydrodynamic and pollutant transport model has been applied to over 40 sites.

RESPONSE: No response necessary.

21. COMMENT: The quality model component (based on the USEPA WASP model), as described in the subject reports, and supplemental information should be adequate for the simulation of processes of importance in the Savannah River estuary.

RESPONSE: No response necessary.

Model Application (General Comments):

22. COMMENT: The calibration of the model, based upon information provided, appears to have been adequate with regard to the estuarine hydrodynamics and salinity variations.

A) The hydrodynamic model predictions seem reasonable, particularly for lower reaches of the estuary for both water surface elevations and velocities.

B) Salinity comparisons also appear reasonable. Although difficult to discern in black and white copies of the figures, it appears that mean (tidally averaged) salinities were reasonably captured. The maximum salinities appeared to be overestimated in the vicinity of Fort Jackson and underestimated at upper stations, particularly in the Little Back River. In the Little Back River, the peak salinities were underestimated by about a factor of two (maximum observed of 11 ppt as compared to the maximum predicted of 4.0 ppt). In subsequent conversations with ATM staff it was indicated that additional sensitivity analyses, not included in the subject reports, had been performed to determine factors affecting these predictions. The 90th percentile frequency for this station was only 3.2, indicating that these maximums occurred infrequently.

RESPONSE: No response necessary.

23. COMMENT: The intended purpose of the DO model was to estimate the system's response to the proposed deepening under different river discharge scenarios. The screening-level application should be adequate for that intended purpose. That is, the model should be adequate to approximate the response (or direction of change) that may occur between the scenarios simulated, but the estimated magnitude of that change is only applicable to the set of conditions simulated (including boundary conditions and specified kinetic rates). The uncertainty associated with the magnitude of the estimated change in DO is unknown. Different conditions and rates could produce different results, so that the magnitude of that predicted change could potentially vary considerably for other conditions.

RESPONSE: Additional refinement of the dissolved oxygen model is proposed for the CED phase of the project. This work will be performed in cooperation with local industrial stakeholders. Model inputs and evaluation criteria will be refined and the results of the revised model will be presented in the Tier II EIS.

24. COMMENT: For this application, a rigorous calibration of the model to DO, and factors affecting DO, was not performed, nor did there appear to be sufficient field data collected to support such an application. Loadings from various sources (some boundaries, point and non-point sources, sediments, etc.) were not quantified by the associated field studies. Rates measured and/or used in previous modeling studies were not used. Some processes know to have a lesser impact on DO predictions in the Savannah River Estuary (algal productivity, nitrogen transformations) were not simulated.

RESPONSE: The methodology used in the evaluation of the dissolved oxygen impacts of the proposed project was presented and approved during initial meetings of the Technical Advisory Group for the Deepening Project. This included modeling representatives of EPA Region IV. We feel that this model as applied is sufficient for determining the net impact of the proposed deepening upon the dissolved oxygen conditions within the system under critical flow conditions. Additional refinement of the dissolved oxygen model is proposed for the CED phase of the project. This work will be performed in cooperation with local industrial stakeholders. Model inputs and evaluation criteria will be refined and the results of the revised model will be presented in the Tier II EIS.

25. COMMENT: The modeling structure should be adequate to address other intended purposes or issues. However, the specific purpose of the application would affect the manner in which it is applied. The application of the model to other intended purposes may require a more detailed field and model application in order to estimate site-specific values of rates used in the model and to assess the accuracy of model predictions. For example, if the study purpose was to assess the impact of loads on instantaneous DO values (rather than statistical averages, as in the subject application) for comparison with DO standards, or to identify critical conditions affecting DO, a different field and modeling approach should have been used.

RESPONSE: Additional refinement of the dissolved oxygen model is proposed for the CED phase of the project. This work will be performed in cooperation with local industrial stakeholders. Model inputs and evaluation criteria will be refined and the results of the revised model will be presented in the Tier II EIS.

26. COMMENT: A sensitivity analysis should be performed with the existing model to estimate the impact of the uncertain coefficients on model predictions to provide some bounds on those predictions, for the conditions simulated. A sensitivity analysis could also be performed to estimate the impact of other, potentially more critical conditions, such as those previously observed to have resulted in a more severe DO depletion that was observed in this study.

RESPONSE: Additional refinement of the dissolved oxygen model is proposed for the CED phase of the project. This work will be performed in cooperation with local industrial stakeholders. Model inputs and evaluation criteria will be refined and the results of the revised model will be presented in the Tier II EIS.

Specific Comments:

27. COMMENT: The coefficients and forcings (boundary conditions, etc.) used in the model application were primarily literature values. In some cases, the values used were not specified in the subject report, so that their potential impact could not be evaluated. Some of these values were determined in subsequent meetings with ATM staff. However, The use of literature values rather than site specific data makes the model predictions uncertain, particularly for model projections of dissolved oxygen, which is influenced by a variety or processes.

RESPONSE: The coefficients and boundary conditions used in the simplified model came primarily from in-stream measurements (BOD Decay Rate, Upstream Boundary Conditions) and from past studies on the system (SOD values, reaeration values). The only values not based upon past

studies were the offshore BODU values. These were the critical rate parameters included in the model.

28. COMMENT: Loads were specified based upon monthly averaged data from the EPA Discharge Monitoring Repots filed with the EPD by the NPDES permit holders. It seemed from the report that the BOD_u data from the DMRs was used to compute loadings, so that the f-ratios used to convert from BOD_5 to BOD_u were literature values, rather than the available site-specific data. However, the report implies that measured BOD_u values were used for the period. It was not clear from the subject report which is the case. In subsequent meetings, it was determined that the literature values (f ratios) were used in the model simulations, rather than available site-specific data.

RESPONSE: The f ratios used in the development of UBOD loadings from the dischargers came from EPA Region IV.

29. COMMENT: The subject report indicates that CBOD and dissolved oxygen concentrations were prescribed for inflows, but the values used were not specified in the subject report and their potential impact on model predictions could not be assessed. Previous studies by the Georgia EPD indicated that the upstream boundary impacted down-stream reaches. The Georgia EPD indicated that 90 % of these boundary loadings will flow into the down-stream study area. In subsequent meetings with ATM it was determined that measured values of BOD and DO were applied for inflows.

RESPONSE: No response necessary.

30. COMMENT: The report states that the salinity, BOD_u and dissolved oxygen concentrations during the ebb flow (inflow from the storage areas) from the extensive marsh areas were prescribed, but the values used were not specified and therefore could not be assessed. Previous studies by the Georgia EPD indicated that the marsh areas are generally in equilibrium and do not directly affect water quality in the study area. Previous studies note an exception is the inland marsh of the Savannah NWR, where DO concentrations during ebbing flow were substantially reduced over those into the marsh during the flood. In subsequent meetings, ATM staff indicated measured values were used at the marsh boundaries.

RESPONSE: No response necessary.

31. COMMENT: For $CBOD_u$, and DO, the subject report indicates that open (ocean) boundary conditions were set to prescribed values during inflow. The values used were not specified, so their potential impact could not be assessed. Previous studies by the Georgia EPD suggested the importance of the open boundary condition, and indicated that if the open boundary BOD_u equals 3.0 mg/l, then about 2.5 million pounds of BOD_u, could be loaded to the system each day. In subsequent meetings, ATM staff indicated that DO was assumed to be saturated and BOD was determined by calibration for the open boundary. This boundary, and its impact on predictions, would then be very uncertain, given the uncertainty in the other loadings.

RESPONSE: The offshore boundary was varied in order to achieve reasonable in-stream values of the UBOD in the critical upper reaches of the system. This is consistent with the methodology presented in the initial TAG meetings for evaluation of the dissolved oxygen impacts.

So long as the in-stream UBOD values in the critical reaches of the system are reasonable, the local impacts of increased stratification and
subsequent reductions in local reaeration would be adequately simulated. Additional model refinements to be conducted during the CED phase will more accurately quantify the breakdown of oxygen demanding loads to the system. The results of these additional studies will be presented in the Tier II EIS to be completed during the CED phase of the project.

32. COMMENT: The deoxygenation rate specified for BOD deoxygenation ("decay") was 0.04 day^{-1}. This value seems generally consistent with values measured in Table 9-1 of the monitoring report, but varies considerably from values used in previous modeling studies by the Georgia EPD of 0.1 day^{-1}. Previous modeling studies also simulated NBOD as well as CBOD, with deoxygenation rates for NBOD of 0.07 to 0.08. The Georgia EPD also noted an immediate oxygen demand term in their previous studies.

RESPONSE: The UBOD deoxygenation rate was based upon in stream measurements and should be a good indication of instream rates at the time of the sampling..

33. COMMENT: The subject report indicates a constant sediment oxygen demand (SOD) was specified for the entire model domain of 1.0 g m^{-2} day^{-1} (Table 5.2). In subsequent meetings, it was determined that the value was varied from 1.0 to 1.5 g m^{-2} day^{-1}. In previous studies, the Georgia EPD collected SOD measurements at 8 stations within the study area, with values ranging from below 1.0 to around 2.0. The highest measured values were near inland freshwater marsh areas in Middle and Little Back rivers (near 3.5 g m^{-2} day^{-1}). Lowest values occurred in the Back River above the tide gate and the main channel of the Savannah River inland to Ebenezer Landing, with values of about 0.5 g m-2 day-1 The Georgia EPD measured SOD values were 1.6-1.7 g m^{-2} day^{-1} in the north and south channels, while values determined by model calibration were 1.75-2.25 g m^{-2} day^{-1}. SOD rates determined by the USACOE and used by Hall (1987) in the application of CE-QUAL-W2 to the estuary varied from 1.2 to 2.9 g m^{-2} day^{-1}. It is not known if these measurements reflect present conditions or what the potential SOD would be in the sediments exposed during the channel deepening.

RESPONSE: The SOD rates used in the model are within the range of values measured and used in past studies. These values should represent bottom conditions at some equilibrium not values immediately following dredging.

34. COMMENT: A diffusive exchange coefficient of 2.5 X 10^{-4} m^2 day^{-1} was specified. It is not clear in the subject report how this rate (approximately molecular diffusion) was used, or how it may impact model predictions. In subsequent meetings with ATM, it was determined that this was a pore water diffusion rate and was not used in predictions.

RESPONSE: No response necessary.

35. COMMENT: A reaeration rate of 2.5 day^{-1} was specified, as stated in the subject report, rather than using one of the alternative methods included in the model to compute the rate. The O'Connor-Dobbins formulation was used to compute reaeration rates in previous modeling studies, but the computed rates are not known and can not be compared to the specified value. In subsequent

meetings with ATM, it was determined that the value was specified since it was not clear which combinations of depths and velocities should be used in formulations for computing reaeration.

RESPONSE: No response necessary.

36. COMMENT: Photosynthesis and respiration rates were not specified. These rates were used in previous modeling studies but were considered to be minor components of the total oxygen dynamics, as suggested in this study.

RESPONSE: Measurements of Chlorophyl a taken during the study indicated that Photosynthesis and Respiration were not critical parameters to simulate.

37. COMMENT: Ammonia or nitrogenous BOD (NBOD) were not included in simulations, although they were in previous modeling studies.

RESPONSE: NBOD was considered in this study as instream UBOD measurements reflect both CBOD and NBOD contributions. This study simply did not separate the two.

38. COMMENT: No comparisons were provided in the subject report for predicted BOD concentrations, for either a quantitative or qualitative evaluation. In subsequent meetings, it was indicated that at least qualitative comparisons of BOD predictions were made, and open boundary conditions (rather than loads) adjusted to obtain a qualitative agreement.

RESPONSE: No response necessary.

39. COMMENT: The DO model predictions were not compared to observed time-varying data in the subject report, as were salinity predictions. Instead, model predictions were compared to selected percentile frequencies similar to comparisons provided in tables for salinity. No statistical comparisons were provided (means, maximum, minimum, standard errors, etc.) as for salinity predictions. The comparisons between model predictions did seem to exhibit a reasonable degree of accuracy, in comparison with mean values, given that this is a simplified application, as indicated in the report. Typically, the median relative error of detailed DO model applications is on the order of 10 %, or about 0.5 mg/L. The relative error associated with a screening level study, such as performed for this project, would be expected to be considerably greater.

RESPONSE: Based upon the proposed simplified dissolved oxygen model evaluation, the calibrations which identify that the model captures the general mean characteristics of the dissolved oxygen longitudinal distribution were deemed sufficient.

40. COMMENT: It is not known if the conditions to which the model was calibrated and applied represent critical conditions for the estuary. Conditions measured by the Georgia EPD in 1989 and 1990 (EPD 1990, 1991) indicate pockets of low DO water over relatively large areas. Unlike a riverine system, the critical conditions may not be those with the lowest flow, but rather those that may tend to trap low DO water, or oxygen demanding materials, in certain areas, such as was observed in 1989 and 1990.

RESPONSE: The conditions used in the model impact analyses (other than freshwater inflow) reflect measured conditions from July through September 1997. These conditions captured a critical low flow period of flow less than 6000 cfs. Flows simulated for the dissolved oxygen impacts ranged from 4000 cfs to 9500 cfs.

41. COMMENT: The model was calibrated to percentile frequencies, rather than absolute values. Therefore, it appears to have been calibrated to represent average rather than extreme conditions. For example, tidally averaged observations (Table 4-2) at the 10 percentile frequency were generally above 3.0 mg/L, while instantaneous values (e.g. Figure 4-6-7) of less than 2.0 mg/l were observed. The applicable DO standards are instantaneous values, rather than averages.

RESPONSE: The model was calibrated to both 50th and 90th percentiles of the raw data. The 90th percentiles represent more extreme conditions, I.e. 90 percent of the time the measured dissolved oxygen is above this value. Therefore the values used are not tidally averaged but percentile representations of instantaneous values.

42. COMMENT: The temperature conditions used in the application of the dissolved oxygen model were not specified in the subject report. During subsequent meetings, it was determined that temperature was specified, based upon field data collected as part of this study, and not simulated.

RESPONSE: No response necessary.

43. COMMENT: PROTECTION OF INSTREAM DISSOLVED OXYGEN

Decisions about instream dissolved oxygen (DO) protection, including: water quality criteria, NPDES permit limits and State Water Quality Certifications are appropriately made by considering DO impacts at DO-stressful ("critical") conditions. Critical conditions typically include specified water temperatures, stream flows, segment boundary conditions and (for tidal segments) tide ranges.

The normal approach for considering the DO impact of a proposed action is to construct and calibrate an appropriate water quality model using field data that are as close to DO-critical conditions as possible. Next, the "field-calibrated model" is adjusted to simulate selected combinations of critical conditions. This critical-conditions model" is then used to predict the water-quality impact of proposed actions-

In the DEIS for the proposed Harbor expansion, there are no critical conditions DO simulations. The DO impact of the proposed project is evaluated only within the context of the 1997 field-calibrated model which is not representative of critical conditions for DO. This lack of critical conditions DO projections for the proposed project is a significant shortcoming that needs to be addressed in order to reasonably consider DO impacts and potential mitigation measures as part of the project.

Georgia EPD has previously assumed a DO-critical water temperature of 300C for Savannah Harbor with a 7Q 10 low flow for August (assumed to be the hottest month) at the Clyo gage. During September 1997, when special regulated low-flow conditions were arranged, the air temperatures in Savannah, already well below seasonal norms, were rapidly decreasing. This rapid decrease temperature decrease in September 1997 was reflected in the water temperature data reported in the DEIS. The rapid decrease in temperatures during the 1997 study period raises concern that vertical

mixing may have been impacted by transient temperature-induced density gradients that would not exist during critical high temperature conditions.

Georgia's instream DO criteria are applicable for all streamflows exceeding the 7Q1O low flow except for flow-regulated stream segments where the DO criteria are applicable for all flows. While the Savannah River is definitely a regulated segment downstream from Clark Hill Dam, EPD has previously used the August 7Q1O low flow as a DO-critical low flow condition for Savannah Harbor. Using the period of streamflow record (Clyo gage) from 1954 (after Clark Hill Dam was operating) through 1997, low-flow frequency analyses were conducted. Figure 3 depicts seasonal (May-October) low flows for normal (2-year return) and extreme (10-year and 20-year) low-flow conditions as well as the "period of record" extreme low flows recorded at the Clyo gage. The record daily low flow is 4400 cfs (July 22, 1988) and the seasonal (May-October) 7Q1O is 5,300 cfs.

Figure 4 compares the 7-day moving average of daily streamflow at the Clyo gage during the 1997 DEIS field sampling period to the 7-day duration low-flow statistics. In July and August of 1997, streamflows were significantly higher than normal low-flows. But as a result of special release arrangements at Clark Hill Dam, 7-day average flows were intentionally held at, or slightly below, the August 7Q10 of 6050 cfs for approximately two weeks in September 1997 to create a critical low-flow condition. One possible concern with this created low-flow condition is the water quality "memory" of the system related to higher flows immediately preceding the special low flow conditions of September.

As for critical tide conditions, EPD has previously assumed that Spring tides are the most DO-stressful tides because higher high tides push saline water further upstream and thereby reduce DO saturation concentrations. While this may be the case, it would be prudent to evaluate both Spring tides and Neep tides to be certain that density-induced DO gradients are properly considered.

RESPONSE: Additional refinement of the dissolved oxygen model, including consideration of more "critical" condition runs, is proposed for the CED phase of the project. This work will be performed in cooperation with local industrial stakeholders. Model inputs and evaluation criteria will be refined and the results of the revised model will be presented in the Tier II EIS.

44. COMMENT: A Conceptual Design was provided that was prepared by Dr, R.E. Speece on the feasibility of supplementing DO in Savannah Harbor. After the basic feasibility was discussed, three potential alternate designs were evaluated. The system requirements and described and comparisons were made between the three systems. The following information summarizes the comparison:

U-Tube	**Cone**	**Bubbler**
Equipment on land	Equipment in harbor outside of navigation channel	Equipment within navigation channel
No impacts to shipping	No impacts to shipping	Potential impacts to shipping
Dredging not impacted	Dredging not impacted	Potential impacts to annual dredging
25 year life	25 year life	2-4 year life

90 percent oxygen absorption efficiency	90 percent oxygen absorption efficiency	65 percent oxygen absorption efficiency
Anchoring will not impact system	Anchoring will not impact system	Anchoring may impact system
Two installations over 15 miles of channel	Five installations over 15 miles of channel	Six miles of tubing over 15 miles of channel
Oxygen present worth $5,900,000	Oxygen present worth $5,900,000	Oxygen present worth $8,000,000
System present worth $24,000,000	System present worth <$12,000,000	System present worth $ 5,900,000

RESPONSE: The estimated cost for the most expensive alternative presented has been included in the project costs.

Savannah Electric

K.R. Willis
Vice President
Treasurer and
Chief Financial Officer

600 East Bay Street
P.O. Box 968
Savannah, Georgia 31402

Tel 912.232.7171

SAVANNAH ELECTRIC
A **SOUTHERN COMPANY**

19 June 1998

Department of the Army
Savannah District, Corps of Engineers
P.0. Box 889
Savannah, GA 31402

To Whom It May Concern:

The following are comments by Savannah Electric and Power Company about the Draft Feasibility Report and a Draft Environmental Impact Statement for proposed deepening of the Savannah Harbor by the Corps of Engineers and the Georgia Ports Authority:

I Savannah Electric requests a 30 day extension to allow more complete review of the massive amount of information contained in these two documents.

2. Savannah Electric requests a public hearing to discuss the harbor deepening proposals and their potentially detrimental impact on Savannah Electric's electric generating facilities at Plant Riverside in downtown Savannah and Plant Kraft in Port Wentworth. Riverbank stabilization has been a problem at these facilities after previous channel deepening and widening projects, and likely will be more serious if this project proceeds.

3. The Environmental Impact Statement attempts to address potential impacts of the proposed deepening on the River's water quality and, in particular, the DO levels both pre- and post-project. The industrial facilities situated along the Savannah River are regulated in regards to river water quality and their industrial water discharge. If the DO levels are adversely impacted by the dredging event, the industries along the river could be penalized or required to modify their discharge rates into the water to accommodate the change in water quality caused by the dredging.

4. The previous Harbor Deepening project in 1993-1994 created increased sedimentation rates in the Harbor channel and individual berths along the River. This increase required more frequent and costly maintenance dredging operations to be performed by all the facilities operating along the River to maintain their usable water depths. In all likelihood, the proposed deepening project could further increase the

amount of sedimentation in the channel and berths along the river. With the increase in volume of maintenance dredge material in the channel after the previous deepening, the Corps was required to dominate the use of the Upland Confined Disposal Facilities, CDF's, restricting their use by other terminals for their maintenance work. As indicated in the draft documents, several of these disposal areas are near their capacity. The disposal area adjacent to Plant Kraft, Onslow Island, is identified as not being used for the deepening project but will be used by the Corps for maintenance work. With the remaining disposal areas tagged by the Corps for the deepening effort, it is likely the Onslow Island disposal area will be quickly made unavailable to all users except the Government. Although it is not anticipated that the Plant Kraft facility will incur sedimentation increases, the unavailability of disposal areas could hinder SEPCO's ability to handle present maintenance dredging.

5. With the proposed deepening project expecting to monopolize the remaining disposal areas capable of receiving dredged material, and the sedimentation rates now occurring or increasing, there will not be sufficient upland disposal facilities available for private terminals to use for their maintenance dredging work. The Corps identified in their LTMS (USCOE 1996) a potential solution to this issue of an option of having the Corps dredging contract for the channel include performance of dredging of private berths. With Savannah Electric's Plant Kraft upstream of the proposed dredging limits, it is likely that this facility would be excluded from the Corps contract and would suffer from lack of available dredge disposal areas.

6. The draft documents specify that the deepening would consist of extending the existing side slopes to the new proposed depth, i.e., no widening is generally planned. This design would create a narrow channel for the deep draft vessels proposed, requiring the vessel to remain in the center of the channel during the movements in and out of the Harbor. Passing of vessels when one or both of the ships are deep draft will not be allowed. This methodology could impact the arrivals and departures of other non-GPA vessels such as the coal carriers for Savannah Electric.

7. The Feasibility Study document identified the various types of the cargo entering the Harbor but failed to identify the coal shipments arriving monthly to Savannah Electric's Savannah River Facility in Port Wentworth. This cargo is vital in providing electrical power to the region and plays a significant role in the local economy.

8. The draft document mentions deepening the Port Wentworth Turning Basin as mitigation to fish impacts by the proposed deepening, however, there is no evidence provided indicating whether consideration has been given to whether there exists any potential impacts to the adjacent facilities.

Very truly yours,

K.R. Willis

Letter response

SAVANNAH ELECTRIC

600 East Bay Street
P.O. Box 968
Savannah, Georgia 31402

Date: June 19, 1998

1. COMMENT: Savannah Electric requests a 30-day extension to allow more complete review of the massive amount of information contained in these two documents.

RESPONSE: Savannah District informed SEPCO in a letter dated June 23, 1998 that it had extended the review period until July 7, 1998.

2. COMMENT: Savannah Electric requests a public hearing to discuss the harbor deepening proposals and their potentially detrimental impact on Savannah Electric's electric generating facilities at Plant Riverside in downtown Savannah and Plant Kraft in Port Wentworth.

RESPONSE: GPA has been meeting with individual groups and agencies during the Public Comment period, and plans to hold public information meetings and hearings during the CED phase as part of the preparation of the Tier II EIS.

3. COMMENT: Riverbank stabilization has been a problem at Savannah Electric's electric generating facilities at Plant Riverside in downtown Savannah and Plant Kraft in Port Wentworth facilities after previous channel deepening and widening projects, and likely will be more serious if this project proceeds.

RESPONSE: There has been and will be no deepening of the harbor in the Port Wentworth area, therefore this project will not impact that area. Bank stabilization problems in other areas of the harbor (not close to the channel) will not be worsen by deepening of the harbor.

4. COMMENT: The EIS attempts to address potential impacts of the proposed deepening on the River's water quality and, in particular, the DO levels both pre- and post-project. The industrial facilities situated along the Savannah River are regulated in regards to river water quality and their industrial water discharge. If the DO levels are

adversely impacted by the dredging event, the industries along the river could be penalized or required to modify their discharge rates into the water to accommodate the change in water quality caused by the dredging.

RESPONSE: No response necessary.

5. COMMENT: The previous Harbor Deepening project in 1993-1994 created increased sedimentation rates in the Harbor channel and individual berths along the River. This increase required more frequent and costly maintenance dredging operations to be performed by all the facilities operating along the River to maintain their usable water depths. In all likelihood, the proposed deepening project could further increase the amount of sedimentation in the channel and berths along the river. With the increase in volume of maintenance dredge material in the channel after the previous deepening, the Corps was required to dominate the use of the upland CDF's, restricting their use by other terminals for their maintenance work. As indicated in the draft documents, several of these disposal areas are near their capacity. The disposal area adjacent to Plant Kraft, Onslow Island, is identified as not being used for the deepening project but will be used by the Corps for maintenance work. With the remaining disposal areas tagged by the Corps for the deepening effort, it is likely the Onslow Island disposal area will be quickly made unavailable to all users except the Government. Although it is not anticipated that the Plant Kraft facility will incur sedimentation increases, the unavailability of disposal areas could hinder SEPCO's ability to handle present maintenance dredging.

RESPONSE: The total average annual volume of maintenance material dredged from the project has not increased since completion of the last deepening project. What has occurred has been a shift in the location of the material within the project limits. This can be attributed more to closing the New Cut channel, which occurred prior to the deepening, than to the deepening project. Prior to closing New Cut, approximately 4.2 million CY of material were dredged from the navigation channel and approximately 4.0 million CY were removed from the sediment basin. Since closing New Cut, only approximately 2.4 million CY are removed from the sediment basin and the remainder of the material shoals in the navigation channel. Based on previous studies, the total average annual shoaling in Savannah Harbor for the last forty years has been approximately 7 million CY. An increase in the total shoaling resulting from the proposed expansion is not anticipated. We do, however, anticipate upstream shift in shoaling based on changes in the velocities and location of the salinity wedge. Documents prepared for the expansion project in no way restrict the use of confined disposal areas in Savannah Harbor to the Corps. The project local sponsor is responsible for providing disposal areas and retains the authority to allow unrestricted use of any and all disposal areas.

6. COMMENT: With the proposed deepening project expecting to monopolize the remaining disposal areas capable of receiving dredged material, and the sedimentation rates now occurring or increasing, there will not be sufficient upland disposal facilities available for private terminals to use for their maintenance dredging work. The Corps identified in their LTMS (USCOE 1996) a potential solution to this issue of an option of having the Corps

dredging contract for the channel include performance of dredging of private berths. With Savannah Electric's Plant Kraft upstream of the proposed dredging limits, it is likely that this facility would be excluded from the Corps contract and would suffer from lack of available dredged material disposal areas.

RESPONSE: The expansion project will not monopolize the existing confined disposal areas. In fact, not all of the areas will be used. The project estimate includes the costs to reimburse the local sponsor for accelerated dike construction caused by using the existing disposal areas for expansion dredging. In addition, the expansion dredging will provide suitable material for future dike improvement projects.

Terminal operators, both private and public, retain responsibility for maintenance of adequate depths at their berths to receive whatever vessels they desire to dock at their facilities. Provision of a site to deposit sediments removed from the berth is part of that responsibility. The availability of Federal Project CDF's for private users during the deepening project would follow the same procedure as is in effect for normal maintenance operations. The CDF's closest to Plant Kraft are not proposed for use in this deepening project. Maintenance sediments in the Federal channel would be removed along with the new work material, so they would be deposited in CDFs downstream of the Talmadge Bridge. Therefore, the availability of CDFs upstream of the Bridge for private use is not likely to change from the present situation.

7. COMMENT: The draft documents specify that the deepening would consist of extending the existing side slopes to the new proposed depth, i.e., no widening is generally planned. This design would create a narrow channel for the deep draft vessels proposed, requiring the vessel to remain in the center of the channel during the movements in and out of the Harbor. Passing of vessels when one or both of the ships are deep draft will not be allowed. This methodology could impact the arrivals and departures of other non-GPA vessels such as the coal carriers for Savannah Electric.

RESPONSE: The design was selected to minimize the disturbance to land-side facilities and the environment. The effect of deep draft vessels on navigation in the channel has been considered in the economic analyses.
The deepened channel will not alter the practices the pilots currently use in bringing Panamax vessels into the harbor. Two way traffic for these vessels will not be restricted and vessels may meet and pass under conditions the pilots determine are safe. It is not possible to design a channel to accommodate two-way traffic for post-Panamax vessels with the development that exists on the banks of the river. Movement of vessels will require coordination when post-Panamax vessels are transiting the project.

8. COMMENT: The Feasibility Study document identified the various types of the cargo entering the Harbor but failed to identify the coal shipments arriving monthly to Savannah Electric's Savannah River Facility in Port Wentworth. This cargo is vital in providing electrical power to the region and plays a significant role in the local economy.

RESPONSE: Bulk cargoes were evaluated in the preliminary economic analysis but were found to be a very small component of total benefits due to the size of the ships utilized in this trade.

9. COMMENT: The draft document mentions deepening the Port Wentworth Turning Basin as mitigation to fish impacts by the proposed deepening, however, there is no evidence provided indicating whether consideration has been given to whether there exists any potential impacts to the adjacent facilities.

RESPONSE: The proposed deepening of the Port Wentworth Turning Basin was sited in recognition of the facilities that line the harbor's shorelines. Dredging would only occur within the footprint of the existing channel and turning basin, so that no high ground would be adversely affected.

SAVANNAH PILOTS ASSOCIATION
550 East York Street
Post Office Box 9267
Savannah, Georgia 31412
(912)236-0226

July 5, 1998

Mr. M. J. Yuschishin
Chief, Planning Division
U.S. Army Corps of Engineers
P.0. Box 889
Savannah, GA 31402-0889

RE: Draft Feasibility Report Impact Statement,
Savannah Harbor Expansion, Revision A, 4/26/98.

Dear Sir:

I am William T. Brown, Master Pilot at the Port of Savannah, President of the Savannah Pilots Association and Chairman of the Port and Trade Development Committee of the Savannah Economic Development Authority. I was licensed as a pilot in 1954 and have had considerable experience in port planning since that date. The Savannah Pilots Association is composed of Federally and State licensed pilots. Our primary purpose is to ensure the safe and efficient transit of seagoing vessels, which are mandated by law to use pilots, on the waters of the Savannah Bar and Harbor. Thank you for extending me an opportunity to comment.

We endorse a 50 foot channel. The sizes of vessels calling are increasing as are their deepest drafts. The margins of our channels are restricted by the geography of the land and thus, require that specific ship handling and movement restrictions be applied by our Association.

The greatest restriction is in the matter of underkeel clearance. International standards recommend the application of a depth factor of 1.1 times vessel draft on inshore waters, and 1.2 times vessel draft on offshore waters. It is only a matter of arithmetic to calculate the depth requirements for a vessel drawing 45 feet.

A second category of restriction occurs because the channels are not typically wide enough to enable two large ships to meet each other safely. Chapter 8 of the USACE Engineer Manual (EM 1110-2-1613, of 31 August, 1995) addressed channel design width criteria. Within the context of that Manual, our harbor channels are best described as variably "Canal" and “Trench” channels. Our tidal current velocities are in the 1.5 to 3.0

knot range and we probably have the "Best Aids to Navigation". As a result, the channel width criteria multiplier applied to vessel beam for one way traffic is 4.0 on the "Canal" portions and 5.0 on the "Trench" portions; for two-way traffic, it is 5.5 and 6.5 respectively. Our offshore channels on the bar fall variably in the categories of "Trench" and "Shallow" channels; the published multiplier criteria for "Shallow" two-way traffic is 8.0 and one-way traffic is 5.5.

It is obvious that Savannah is straining at the one-way traffic criteria for Panamax ships, i.e., a 105 foot beam. Every possible stretch of channel that can be widened to enable a meeting situation is vital. And, the more water that is provided under the keel relieves the stressed hydraulic problems.

If possible, the entrance channel on the bar, Tybee Range and Bloody Point Range, which are now only 600 feet wide, should be widened to at least 800 feet, and optimally to 1000 feet. The former width would be consistent with the USACE published criteria for two-way traffic of Panamax ships in a "Trench" channel, the latter for port-Panamax ships in "Trench" channels and Panamax ships in "Shallow" channels.

We pilots pride ourselves on our skills and qualifications that enable us to handle ships under such extreme geographic and hydrographic limitations. With the advent of deeper, longer, and wider ships, we must ensure that our waterways are enlarged and expanded to the utmost.

Sincerely,

William T. Brown
Master Pilot

Letter response

SAVANNAH PILOTS ASSOCIATION
550 East York Street
Post Office Box 9267
Savannah, Georgia 31412

Date: July 5, 1998

1. COMMENT: The Savannah Pilots Association is composed of Federally and State licensed pilots. Our primary purpose is to ensure the safe and efficient transit of seagoing vessels, which are mandated by law to use pilots, on the waters of the Savannah Bar and Harbor.

RESPONSE: No response necessary.

2. COMMENT: We endorse a 50 foot channel. The sizes of vessels calling are increasing as are their deepest drafts. The margins of our channels are restricted by the geography of the land and thus, require that specific ship handling and movement restrictions be applied by our Association.

RESPONSE: The economic analysis confirms that vessel length and draft have been increasing.

3. COMMENT: The greatest restriction is in the matter of underkeel clearance. International standards recommend the application of a depth factor of 1.1 times vessel draft on inshore waters, and 1.2 times vessel draft on offshore waters. It is only a matter of arithmetic to calculate the depth requirements for a vessel drawing 45 feet.

RESPONSE: The channel design includes sufficient clearances for the 1.2 times depth factor. The underkeel clearance was utilized in accordance with EM 1110-2-1613, "Hydraulic Design Guidance for Deep Draft Navigation projects."

4. COMMENT: A second category of restriction occurs because the channels are not typically wide enough to enable two large ships to meet each other safely. Chapter 8 of the USACE Engineer Manual (EM 1110-2-1613, of 31 August, 1995) addressed channel design width criteria. Within the context of that Manual, our harbor channels are best described as variably "Canal" and “Trench” channels. Our tidal current velocities are in the 1.5 to 3.0 knot range and we probably have the "Best Aids to Navigation". As a result, the channel width criteria multiplier applied to vessel beam for one way traffic is 4.0 on the "Canal" portions and 5.0 on the "Trench” portions; for two-way traffic, it is 5.5 and 6.5 respectively. Our offshore channels on the bar fall variably in the categories of

"Trench" and “Shallow" channels; the published multiplier criteria for "Shallow" two-way traffic is 8.0 and one-way traffic is 5.5.

It is obvious that Savannah is straining at the one-way traffic criteria for Panamax ships, i.e., a 105 foot beam. Every possible stretch of channel that can be widened to enable a meeting situation is vital. And, the more water that is provided under the keel relieves the stressed hydraulic problems.

If possible, the entrance channel on the bar, Tybee Range and Bloody Point Range, which are now only 600 feet wide, should be widened to at least 800 feet, and optimally to 1000 feet. The former width would be consistent with the USACE published criteria for two-way traffic of Panamax ships in a "Trench" channel, the latter for port-Panamax ships in "Trench" channels and Panamax ships in "Shallow" channels.

RESPONSE: The channel was not designed for full two - way traffic for the design ship at all times.

5. COMMENT: We pilots pride ourselves on our skills and qualifications that enable us to handle ships under such extreme geographic and hydrographic limitations. With the advent of deeper, longer, and wider ships, we must ensure that our waterways are enlarged and expanded to the utmost.

RESPONSE: No response necessary.

Savannah River Wharf Company

CONBULK MARINE TERMINALS GROUP

SAVANNAH RIVER WHARF COMPANY
A subsidiary of Peeples Industries, Inc.
Orlean Building; 6001 Chatham Center Drive; Suite 350
Savannah, Georgia 31405
P.O. Box 2647
Savannah, Georgia 31402
(912) 235-4850 FAX (912) 238-5524

June 19, 1998

Mr. William G. Bailey
U.S. Army Corps of Engineers, PD-E
Post Office Box 889
Savannah, GA 31402-0889

Re: GPA Savannah Harbor Expansion

Dear Mr. Bailey:

We are opposed to the GPA Expansion for the Savannah Harbor. The recent deepening project has already eroded Savannah River Wharf's waterfront, causing us to lose about 20 feet of terminal property. Any further deepening will certainly increase this erosion and impact our ability to remain in business. We are concerned with the possibility of one way ship traffic and its adverse impact on our shipping customers. We are concerned with the negative impact on the Savannah River water quality with increase salinity. This will reduce the dissolved oxygen on UDS's in the upper harbor and what this will do to future maintenance dredging, costs for the Savannah Harbor.

In conclusion, we oppose this project because of the present undermining of our deep water terminal; the negative impact on our present deep water terminal business; the negative impact on our present manufacturing business; and the negative impact on our present maintenance dredging.

Sincerely,

SAVANNAH RIVER WHARF COMPANY

John R. Benton, Jr.
Senior Vice President

Letter response

CONBULK MARINE TERMINALS GROUP

SAVANNAH RIVER WHARF COMPANY
A subsidiary of Peeples Industries, Inc.
Orlean Building; 6001 Chatham Center Drive; Suite 350
Savannah, Georgia 31405
P.O. Box 2647
Savannah, Georgia 31402

June 19, 1998

1. COMMENT: We are opposed to the GPA Expansion for the Savannah Harbor.

RESPONSE: No response necessary.

2. COMMENT: The recent deepening project has already eroded Savannah River Wharf's waterfront, causing us to lose about 20 feet of terminal property. Any further deepening will certainly increase this erosion and impact our ability to remain in business. We are concerned with the possibility of one way ship traffic and its adverse impact on our shipping customers. We are concerned with the negative impact on the Savannah River water quality with increase salinity. This will reduce the dissolved oxygen on UDS's in the upper harbor and what this will do to future maintenance dredging, costs for the Savannah Harbor.

RESPONSE: (1) Bank erosion - East Coast Terminal has been in litigation with the District over this issue for several years and comment on this matter is inappropriate at this time.

(2) One-way traffic – The deepened channel will not alter the practices the pilots currently use in bringing Panamax vessels into the harbor. Two way traffic for these vessels will not be restricted and vessels may meet and pass under conditions the pilots determine are safe. It is not possible to design a channel to accommodate two-way traffic for post-Panamax vessels with the development that exists on the banks of the river. Movement of vessels will require coordination when post-Panamax vessels are transiting the project.

(3) Impact on UDS's – The project will not have an adverse impact on the future use of confined disposal sites located in the upper harbor. Disposal area 2A will not be used for the expansion dredging. All material dredged upstream of the Talmadge Bridge will be pumped to disposal area 12A. In addition, the expansion dredging will provide suitable material which can be used for future dike improvement projects.

(4) Impact on future maintenance dredging (DO impacts) – One of the project features includes reaeration of the river to mitigate for the predicted reduction of DO in the river. This feature is being included in the preliminary project design and cost estimates and is being incorporated into the revised project documents and project cost estimate.

3. COMMENT: In conclusion, we oppose this project because of the present undermining of our deep water terminal; the negative impact on our present deep water terminal business; the negative impact on our present manufacturing business; and the negative impact on our present maintenance dredging.

RESPONSE: No response necessary.

SAVANNAH SUGAR REFINERY
DIVISION OF SAVANNAH FOODS & INDUSTRIES, INC.
Refinery * * * * PORT WENTWORTH * SAVANNAH, GEORGIA
Telephone * * (912) 964-1361 * P.O. Box 710 * SAVANNAH, GA 31498-4710

July 7, 1998

Mr. William Bailey
United States Army Corps of Engineers
Savannah District
Environmental Resources Branch
P.O. Box 889
1 00 West Oglethorpe Avenue
Savannah, Georgia 31402

Re: April, 1998 Draft Environmental Impact Statement and Draft Feasibility Study for the Proposed Expansion of the Savannah Harbor

Dear Mr. Bailey:

These comments are being provided by Savannah Foods and Industries, Inc. ("Savannah Foods"). We appreciate the opportunity to review the April, 1998 Draft Environmental Impact Statement (the "DEIS"), Draft Feasibility Study, and other materials related to the United States Army Corps of Engineers' (the "Corps") proposed expansion of the Savannah Harbor (the "Project"). At the outset we wish to stress that it is not our intention to compromise this harbor deepening project. Rather we have identified a number of concerns that we believe can and must be addressed to ensure that the integrity of the Harbor is protected and that the other users of this resource are not left with the responsibility of mitigating any impacts that the Project may have on the Savannah River.

1. Project Summary

The Corps proposes to expand the existing navigation facilities at Savannah Harbor, located in Chatham County, Georgia and Jasper County, South Carolina, by deepening the channel to the ocean from 2 to 8 feet. The Corps has indicated that its preferred alternative involves a deepening of 8 feet, for a total channel depth of 50 feet.

2. Comments Summary

The Project is projected to lower concentrations of dissolved oxygen ("DO") in affected areas of the Savannah River to concentrations below those permissible under Georgia law. In addition, the Project's reduction of DO concentrations violates anti-degradation principles central

to Georgia's, South Carolina's, and federal regulatory schemes designed to protect water quality. The Project is also predicted to increase salinity levels in the River in a manner which will substantially and negatively impact the undersigned. Further, the Corps' utilization of River modeling with respect to Project impacts on DO and salinity levels contain numerous deficiencies. Finally, the Corps' discussions of the Project and Project impacts do not comport with the requirements of the National Environmental Policy Act ("NEPA"), 42 U.S.C. §§ 4321 et seq. (1998), and its implementing regulations, located at 40 C.F.R. §§ 1500 et seq. (1997) and 33 C.F.R. Part 336 (1997). The Members believe that certain mitigation measures can be implemented which will not only alleviate the negative impacts of the Project but may also provide the basis for further enhancing overall water quality in the Savannah River in the future. The Members believe that the Project should proceed only if cost estimates for such mitigation measures are properly included in the Final Feasibility Study and a commitment to develop a Tier II EIS is included in a final EIS that responds to the Members' many concerns.

3. State and Federal Laws Implicated by the DEIS

Expanding the Savannah Harbor as proposed in the DEIS does not comply various state and federal statutes, as well as the Corps' own regulations governing such projects. A discussion of the nature of these violations is briefly set forth below.

A. The Project Predicts Violations of State DO Criteria

Pursuant to the Georgia Water Quality Control Act, Georgia has promulgated regulations intended to enhance water quality and prevent pollution. See Ga. Comp. R. & Regs. r. 391-3-6.03(2)(a). Pursuant to these regulations, Georgia currently classifies the portion of the Savannah River running from the Seaboard Coastline Railroad Bridge (River Mile 27.4) to Fort Pulaski (River Mile 0) as a "Coastal Fishing" area. Id. r. 391-3-6-.03(13). Pursuant to those regulations, DO in the above-referenced portion of the Savannah River may be "no less than 3.0 mg/L in June, July, August, September, and October; not less than 3.5 mg/L in May and November; and no less than 4.0 mg/L in December, January, February, March and April." Id. r. 391-3-6-.03(13) n.1. The regulations note that the DO criteria for that portion of the Savannah River are instantaneous minimums. Id.

GPA's hydrodynamic model predicts that the Project will reduce concentrations of DO present in affected areas of the Savannah River in an amount up to 1 mg/L. DEIS, §§ 5, at 48.[1]

According to the DEIS, the proposed dredging to a depth of 50 feet in the Front River "and, consequently higher stratification, [will] cause local reduction in the overall water column reaeration due to a reduced vertical mixing and increased distance from the bottom layers to the surface." DEIS, § 5, at 28-29. The DEIS also notes that in the 50th percentile DO impacts increase between River Miles 12 and 20.5 to a maximum impact of 0.9 mg/L at the highest estimated flow rate; ninetieth percentile impacts indicate a reduction in DO concentrations of up to 1 mg/L near River Mile 17. Id. at 29.

The predicted reduction in DO concentrations may cause the affected areas of the Savannah River to drop below the minimum DO concentrations established by the State of Georgia.[2] Because the Project may reduce DO concentrations in violation of Georgia's water quality standards, the Corps should reevaluate its proposed dredging plans in order to ensure compliance with such standards.[3]

B. The Project Violates State and Federal Anti-Degradation Principles

The Project, by reducing DO concentrations below those permitted under Georgia law, violates that State's anti-degradation mandate. In addition, because the Project will degrade the quality of the Savannah River in terms of DO, the Project violates the anti-degradation principles of the South Carolina Pollution Control Act, S. C. Code Ann. §§ 48-1-10 et seq. (1998), and of the Federal Water Pollution Control Act (the "Clean Water Act" or "CWA"), 33 U.S.C. § 1251 et seq. (1998).

C. The Project May Result in a Harmful Increase in Chloride Levels in the Lower Savannah River

One significant side effect of the Project's predicted increase in salinity involves the resulting increase in chloride present in certain portions of the Lower Savannah River. According to the DEIS, the Project will, in all likelihood, cause chloride levels to increase proximate to the City of Savannah's raw water intake, located on a tributary of the Savannah River located approximately 8 miles upstream of the harbor project limits. DEIS, § 1.4. Any increase in the fresh water chloride content will have a significant economic impact on all industrial users.[4]

Furthermore, an increase in chloride concentrations will result in increased corrosion, a higher rate of equipment failure, product quality problems and limit our ability to produce pharmaceutical grades of sugars at our Port Wentworth sugar refinery. Our water conservation efforts which emphasize the re-use of process water will be severely diminished due to the presence of non-process-elements, including additional chlorides, in its processes. Regrettably, the Economic Impact portion of the Draft Feasibility Study fails to address the above or similar costs to stakeholders who utilize Industrial and Domestic ("I&D") water for boilers or for the direct processing of products.

The DEIS attempts to downplay the significant impact that increased concentrations of chloride will have on I&D water systems by suggesting that affected intakes can be moved or that the flow rate into such intakes can be artificially increased. DEIS, § 5, at 32. In its Comments to the Corps on the Project, however, the City of Savannah estimates the cost of water intake relocation to be approximately $46 million. See Comments of the City of Savannah (June 12, 1998 and July 7, 1998). The substantial amount of money required to compensate for the predicted change in chloride concentrations warrants additional attention in the EIS.

Finally, it should be noted that if use of Savannah River water becomes less feasible, additional pressure may be brought to bear on underground water sources. The Corps should seek to avoid placing such pressure on such valuable, limited resources.

D. GPA's Modeling Efforts are Deficient with Respect to DO, Salinity, and Other Crucial Impacts of the Project on the Environment

The GPA utilized several models in order to predict Project impacts on DO, salinity, and other crucial ecological factors. In the limited time available to it, the Members have been able to solicit the views of Law Engineering and Environmental Services, Inc. ("Law") and Dr. James L. Martin, Ph.D., P.E., of AScI Corporation, regarding the Corps' modeling efforts. The evaluation of GPA's modeling efforts developed by Law and Dr. Martin[5] is set forth as Appendix A.

E. The Corps' Letter response of the Project does not Comply with NEPA and its Implementing Regulations

NEPA requires that agencies of the federal government include in proposals for "major Federal actions significantly affecting the quality of the human environment a detailed statement" of, among other things: (1) the environmental impact of the proposed action; (2) any adverse environmental effects which cannot be avoided should the proposal be implemented; and (3) alternatives to the proposed action. 42 U.S.C. § 4332(C)(i)-(iii). Such agencies must also "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." Id. § 4332(E). Regulations implementing NEPA are found at 40 C.F.R. § 1500 et seq. (1997) (CEQ regulations) and 33 C.F.R. Part 336 (1997) (Corps regulations concerning discharge of dredged material into waters of United States).

The April, 1998 DEIS prepared by the Corps is insufficient for purposes of NEPA because, among other things,

(1) the Corps fails to adequately discuss the environmental impacts of dredging to depths other than to the Corps-recommended 50-foot depth,

(2) the Corps fails to identify any adverse environmental effects which cannot be avoided should the proposal be implemented, or which could be avoided through dredging to depths other than to 50 feet;

(3) the Corps fails to state that its recommended alternative will, in all likelihood, violate the law of the State of Georgia;

(4) the Corps fails to discuss DO or salinity concentrations at depths other than 50 feet;

(5) the Corps does not adequately discuss the impacts of the Project on the shortnose sturgeon and striped bass;

(6) the Corps has not conducted any studies of alternatives to its recommended 50 foot dredging depth which might resolve conflicts related to the existing, competing uses of the natural resources of the Savannah River;

(7) the Corps has failed to consider any mitigation measures related to the projected increase in salinity and decrease in DO for any of the alternatives;

(8) the Corps has failed to identify reasons why it selected the 50 foot depth alternative when the greatest benefits versus costs appear at a depth of 46 feet;

(9) as more fully set forth in Paragraph D, above, flaws in the Corps' model prevent the Corps from providing an accurate statement concerning the Project's environmental impacts;

(10) given the Project's scope and complexity, the Corps has failed to provide sufficient time for the public to comment on the DEIS; and

(11) given the Project's scope, complexity, and significant environmental impacts, the Corps, as a general matter, has not conducted sufficient information gathering for the DEIS to meet NEPA's "detailed statement" requirement.

If finalized, the DEIS, as currently presented, would undoubtedly be deemed by any reviewing court to be arbitrary, capricious, or otherwise not in accordance with the law.[6]

4. Actions Needed

For all of the reasons set forth above, the Project, as proposed, should not go forward. Savannah Foods can, however, support the Project if the following actions are undertaken by the Corps and GPA:

A. Mitigation measures are undertaken to eliminate the predicted DO deficit.

Savannah Foods believes that mitigation measures related to the predicted DO deficit must take place. To support this effort, Savannah Foods has commissioned Law to study mitigation measures that could eliminate the predicted decrease in DO. Law, assisted by Vanderbilt University professor Dr. Richard Speece, has developed a preliminary feasibility study,[7] a copy of which is attached as Appendix B to these comments. In this study, Law identified alternative mechanisms for providing additional aeration to the River.

Savannah Foods believes that, of the mitigation mechanisms, the "U-Tube" alternative should be included in the Project as the preferred mitigation measure. It should be noted, however, that although Savannah Foods recommends the most expensive of the suggested mitigation mechanisms, the Corps should investigate and consider all reasonable alternatives in a manner consistent with NEPA as a part of its final environmental impact statement ("EIS"). The Corps should further ensure that the Draft Feasibility Study and DEIS are revised to include specific, independent line-items for any DO mitigation mechanism(s) selected in order to ensure that sufficient funds for such mitigation are both authorized and appropriated by Congress as a part of its review of the Project.8

B. Mitigation measures are undertaken to avoid the negative effects of increased chloride levels.

The City of Savannah has already provided comments regarding the necessity for mitigating the predicted increase in chloride levels. Savannah Foods agrees with these comments, and believes that the Project should proceed only if funds are included to undertake the necessary mitigation measures with respect to the predicted chloride increase (i.e., the Corps should ensure that the City's raw water intake structure is relocated to an area where chloride levels will not be increased). The Corps should further ensure that the Draft Feasibility Study and DEIS are revised to include specific, independent line-items for any DO mitigation mechanism(s) selected in order to ensure that sufficient funds for such mitigation are both authorized and appropriated by Congress as a part of its review of the Project.

C. A Final EIS is Developed by the GPA and the Corps and Published for Public Comment.

Savannah Foods believes that a final EIS that corrects the noted deficiencies should be published and subjected to public comment. If the comments, as set forth above, are not addressed in the final EIS, the Project cannot proceed on sound legal footing. More specifically, as noted above, the Corps should include specific, independent line-items in the EIS and Feasibility Study where necessary to ensure that sufficient funds are authorized and appropriated by Congress to mitigate any unavoidable adverse environmental impacts caused by the Project. To the extent that the Corps cannot provide in the EIS a detailed discussion of the costs and engineering requirements of any mitigation measures selected by the Corps to remedy the impacts of the Project, then the Corps should provide such discussion in a Tier II EIS and make such discussion available for public review and comment.

D. The Corps Should Consult with a Technical Advisory Committee Concerning Certain Aspects of the Project Before Completing the EIS.

Before the Corps proceeds with its evaluation of the mitigation measures noted above, Savannah Foods requests the establishment of a Technical Advisory Committee ("TAC") and seeks to be included on such a Committee. In particular, Savannah Foods seeks to engage in a dialogue with the Corps and GPA concerning: (1) the model used to develop the DO and salinity data relied upon by the Corps; (2) the DO mitigation/reaeration project; and (3) the chloride mitigation project, including the relocation of water-intake structures.

5. Conclusion

Savannah Foods does not write these comments in order to thwart the Corps' efforts to ensure that the Savannah Harbor remains a viable commercial port of call both now and in the future. The purpose of these comments is to assist the Corps and the Georgia Ports Authority with their consideration of reasonable alternatives and mitigation measures which will not result in a shift of the costs of maintaining the Savannah River as a multi-use estuary. Savannah Foods urges the Corps and Georgia Ports Authority to explore such alternatives and measures and to include them in the Project.

* * * * *

Thank you again for the opportunity to comment on the April, 1998 Draft Environmental Impact Statement, Draft Feasibility Study, and related materials pertaining to the Corps' proposed dredging of the Savannah Harbor.

If you have any questions concerning the above comments, please contact Ray T. Burke, Jr. Technical Director, Savannah Sugar Refinery, at (912) 964-1361, or write to us care of Savannah Foods and Industries, Inc., P.O. Box 339, Savannah, Georgia, 31402.

Savannah Foods & Industries, Inc. comments on Corps' Proposed Savannah Harbor
Dredging Project

July, 7 1998

Very truly yours,

/s/
_____
William W. Sprague, III
President and Chief Executive Officer
Savannah Foods & Industries, Inc.

cc: Charles A. Perry, Esq.
Harold J. Reheis, Director, EPD
Robert F. McGee, Director, Water Division, USEPA Region IV

[1] The Corps' estimate of the amount of DO potentially removed from the River by the Project appears to understate the actual, anticipated reduction. This understatement is derived from flaws in the Corps' DO modeling program. For example, the Corps' Savannah River model does not take ammonia or nitrogenous biological oxygen demand ("BOD") into account. By omitting certain sources of BOD from the model, the Corps has understated the amount of BOD present in the River and, as a result, has overstated the amount of DO which may be present in the River after the Project is complete. This overstatement of DO, if corrected, may indicate that actual reductions in DO as a result of the Project are greater than predicted by the Corps. Thus, the Project may result in a greater violation of Georgia's water quality standard for the Lower Savannah River than otherwise predicted.

[2] It should be noted that, as of September, 1997, portions of the Savannah River contained concentrations of DO below Georgia's minimum criteria. See Report, Hydrodynamic & Water Quality Monitoring of the Lower Savannah River Estuary, July to September, 1997, App. C, Discrete QA/QC Data, ATM Synoptic Sampling Event 2, September 10-11, 1997, Lower Savannah River, at D-2-16 (noting DO concentrations as low as 0.43 mg/L at Synoptic Station SH-16). To the extent that the DEIS does not address these depressions in DO concentrations and their relationship to past or present Corps projects in greater detail, it is inadequate for purposes of NEPA. See generally infra. Section IV (discussion of DEIS non-compliance with NEPA).

[3] Based on a review of the DEIS and related materials, it is difficult to determine whether the Project will comply with Georgia's water quality standards. This difficulty is derived in large part from the Corps' failure to analyze changes in DO relative to the seasonal, instantaneous, minimum standards mandated under Georgia law. For example, a reduction of 0.5 mg/L DO would be more critical during periods of low flow and high water temperatures, when DO levels are already low. In contrast, a reduction of 0.9 mg/L would not necessarily be significant during periods of high flow and cooler temperatures, when DO resources are more abundant. On an absolute basis, however, the predicted 1 mg/L reduction in DO will, in all likelihood, violate the water quality standard for at least part of the year.

[4] For example, one member of the Harbor Committee estimates an increase in operating costs of about $500,000 per year if the chloride content in its boiler water treatment area were to increase from its current level (10 ppm) to 50 ppm. For increases beyond 50 ppm, that member would need to make significant capital expenditures ranging from $1,000,000 to $3,000,000, depending on the concentration, in order to compensate for the increase in chloride concentrations.

[5] James L. Martin, Ph.D., P.E., AScI Corporation, Review: Hydrodynamic and Water Quality Modeling of the Lower Savannah River Estuary by ATM and ASA, Prepared for the Georgia Ports Authority (July 1, 1998).

[6] Although these comments raise many of the concerns that the Members have concerning the Project, the Members reserve their rights to challenge the DEIS and EIS as being not in accordance with law for purposes of the Administrative Procedures Act ("APA"), 5 U.S.C. § 706(2) (1996), based on the Project's potential to violate state law and federal laws and regulations, including Georgia's water quality standards, the ESA, NEPA, and the Corps' own regulations.

[7] R.E. Speece, Ph.D., Supplemental Oxygenation of Savannah Harbor-Conceptual Design (July 1998).

[8] Such line-items should appear, for example, in Table 6-2 of the Draft Feasibility Study and in the Corps' cost-benefit analyses.

APPENDIX A

Report from James L. Martin, Ph.D., P.E.

Review: Hydrodynamic and Water Quality Modeling of the Lower Savannah River Estuary by ATM and ASA, prepared for the Georgia Ports Authority

Review: Hydrodynamic and Water Quality Modeling of the Lower Savannah River Estuary by ATM and ASA prepared for the Georgia Ports Authority

By: James L. Martin, Ph.D., P.E.
ASc I Corporation

Date: 1 July 1998

Executive Summary

Although the WQMAP modeling system applied to Savannah Harbor seems to be an appropriate framework, there are a number of questions and concerns regarding the appropriateness of certain model inputs and assumptions, particularly with regard to the dissolved oxygen DO portion of the simulation. Also, the 1997 field study period, used for calibration of the model, was wetter and cooler than normal and did not therefore include DO-critical (stressful) combinations of typical high temperatures with concurrent low flows.

Only the 1997 field-calibrated model was used to simulate DO impacts of the proposed project rather than considering critical conditions when DO resources are most limited. In order to make appropriate decisions regarding DO impacts and possible mitigation alternatives, the 1997 field-calibrated model should be revised and adjusted to simulate appropriate critical conditions.

Comments

Modeling System

1. The modeling system applied to the Lower Savannah River Estuary (WQMAP) seems appropriate for meeting the stated goals of the modeling study. The three-dimensional hydrodynamic and water quality model should adequately predict the variations in flows and water quality in the system due to the estuarine and river forcings, given appropriate model set up, boundary conditions, rates and other coefficients.

2. The model selected for application, WQMAP, appears to be comparable to other state-of-the-art three dimensional models. In addition, WQMAP includes grid generators and other supporting software which should make the model easier to implement, and potentially reduce the possibility of errors introduced in the construction of model input. The authors of the hydrodynamic code are well known. The subject reports provide an overview of the modeling structure. Supplemental material provided by ASA (1998) and from WEST (1996)
indicate the boundary-rifted hydrodynamic and pollutant transport model has been applied to over 40 sites (ASA 998, WEST 1996). Muin and Spaulding (1997a,b) described the model formulations, testing of the model against analytical solutions, and the application of the hydrodynamic model to the Providence River. However, previous applications were not evaluated as part of this review.

3. The quality model component (based on the USEPA WASP model), as described in the subject reports, and supplemental information should be adequate for the simulation of processes of importance in the Savannah River estuary.

Model Application (General Comments)

4. The calibration of the model, based upon information provided, appears to have been adequate with regard to the estuarine hydrodynamics and salinity variations.

   A) The hydrodynamic model predictions seem reasonable, particularly for lower reaches of the estuary for both water surface elevations and velocities.

   B) Salinity comparisons also appear reasonable. Although difficult to discern in black and white copies of the figures, it appears that mean (tidally averaged) salinities were reasonably captured. The maximum salinities appeared to be overestimated in the vicinity of Fort Jackson and underestimated at upper stations, particularly in the Little Back River. In the Little Back River, the peak salinities were underestimated by about a factor of two (maximum observed of 11 ppt as compared to the maximum predicted of 4.0 ppt). In subsequent conversations with ATM staff it was indicated that additional sensitivity analyses, not included in the subject reports, had been performed to determine factors affecting these predictions. The 90th percentile frequency for this station was only 3.2, indicating that these maximums occurred infrequently.

1. The intended purpose of the DO model, stated in the subject report to be a simplified application, was to estimate the system's response to the proposed deepening under different river discharge scenarios. The screening-level application should be adequate for that intended purpose. That is, the model should be adequate to approximate the response (or direction of change) that may occur between the scenarios simulated, but the estimated magnitude of that change is only applicable to the set of conditions simulated (including boundary conditions and specified kinetic rates). The uncertainty associated with the magnitude of the estimated change in DO is unknown. Different conditions and rates could produce different results, so that the magnitude of that predicted change could potentially vary considerably for other conditions.

2. For this application, a rigorous calibration of the model to DO, and factors affecting DO, was not performed, nor did there appear to be sufficient field data collected to support such an application. Loadings from various sources (some boundaries, point and non-point sources, sediments, etc.) were not quantified by the associated field studies. Rates measured and/or used in previous modeling studies were not utilized. Some processes know to have a lesser impact on DO predictions in the Savannah River Estuary (algal productivity, nitrogen transformations) were not simulated.

3. The modeling structure should be adequate to address other intended purposes or issues. However, the specific purpose of the application would affect the manner in which it is applied. The application of the model to other intended purposes may require a more detailed field and model application in order to estimate site-specific values of rates used in the model and to assess the accuracy of model predictions. For example, if the study purpose was to assess the impact of loads on instantaneous DO values (rather than statistical averages, as in the subject application) for comparison with DO standards, or to identify critical conditions affecting DO, a different field and modeling approach should have been used.

4. A sensitivity analysis should be performed with the existing model to estimate the impact of the uncertain coefficients on model predictions to provide some bounds on those predictions, for the conditions simulated. A sensitivity analysis could also be performed to estimate the impact of other, potentially more critical conditions, such as those previously observed to have resulted in a more severe DO depletion that was observed in this study.

Specific Comments

5. The coefficients and forcings (boundary conditions, etc.) used in the model application were primarily literature values. In some cases, the values used were not specified in the subject report, so that their potential impact could not be evaluated. Some of these values were determined in subsequent meetings with ATM staff. However, The use of literature values rather than site specific data makes the model predictions uncertain, particularly for model projections of dissolved oxygen, which is influenced by a variety or processes.

6. Loads were specified based upon monthly averaged data from the EPA Discharge Monitoring Repots (DMRS) filed with the EPD by the NPDES permit holders. It seemed from the report that the BOD_u data from the DMRs was used to compute loadings, so that the f-ratios used to convert from BOD_5 to BOD_u were literature values, rather than the available site-specific data. However, the report implies that measured BOD_u values were used for the period. It was not clear from the subject report which is the case. In subsequent meetings, it was determined that the literature values (f ratios) were used in the model simulations, rather than available site-specific data.

7. The subject report indicates that CBOD and dissolved oxygen concentrations were prescribed for inflows, but the values used were not specified in the subject report and their potential impact on model predictions could not be assessed. Previous studies by the Georgia EPD indicated that the upstream boundary impacted down-stream reaches. The Georgia EPD indicated that 90 % of these boundary loadings will flow into the down-stream study area. In subsequent meetings with ATM it was determined that measured values of BOD and DO were applied for inflows.

8. The report states that the salinity, BOD_u and dissolved oxygen concentrations during the ebb flow (inflow from the storage areas) from the extensive marsh areas were prescribed, but the values used were not specified and therefore could not be assessed. Previous studies by the Georgia EPD indicated that the marsh areas are generally in equilibrium and do not directly affect water quality in the study area. Previous studies note an exception is the inland marsh of the Savannah National Wildlife Refuge, where dissolved oxygen concentrations during ebbing flow were substantially reduced over those into the marsh during the flood. In subsequent meetings, ATM staff indicated measured values were used at the marsh boundaries.

9. For $CBOD_u$, and dissolved oxygen, the subject report indicates that open (ocean) boundary conditions were set to prescribed values during inflow. The values used were not specified, so their potential impact could not be assessed. Previous studies by the Georgia EPD suggested the importance of the open boundary condition, and indicated that if the open boundary BOD_u equals 3.0 mg/l, then about 2.5 million pounds of BOD_u, could be loaded to the system each day. In subsequent meetings, ATM staff indicated that DO was assumed to be saturated and BOD was determined by calibration for the open boundary. This boundary, and its impact on predictions, would then be very uncertain, given the uncertainty in the other loadings.

10. The deoxygenation rate specified for BOD deoxygenation ("decay") was 0.04 day^{-1}. This value seems generally consistent with values measured in Table 9-1 of the monitoring report, but varies considerably from values used in previous modeling studies by the Georgia EPD of 0.1 day^{-1}. Previous modeling studies also simulated NBOD as well as CBOD, with deoxygenation rates for NBOD of 0.07 to 0.08. The Georgia EPD also noted an immediate oxygen demand term in their previous studies.

11. The subject report indicates a constant sediment oxygen demand (SOD) was specified for the entire model domain of 1.0 g m^{-2} day^{-1} (Table 5.2). In subsequent meetings, it was determined that

the value was varied from 1.0 to 1.5 g m^{-2} day^{-1}. In previous studies, the Georgia EPD collected SOD measurements at 8 stations within the study area, with values ranging from below 1.0 to around 2.0. The highest measured values were near inland freshwater marsh areas in Middle and Little Back rivers (near 3.5 g m^{-2} day^{-1}). Lowest values occurred in the Back River above the tide gate and the main channel of the Savannah River inland to Ebenezer Landing, with values of about 0.5 g m-2 day-1. The Georgia EPD measured SOD values were 1.6-1.7 g m^{-2} day^{-1} in the north and south channels, while values determined by model calibration were 1.75-2.25 g m^{-2} day^{-1}. SOD rates determined by the USACOE and used by Hall (1987) in the application of CE-QUAL-W2 to the estuary varied from 1.2 to 2.9 g m^{-2} day^{-1}. It is not known if these measurements reflect present conditions or what the potential SOD would be in the sediments exposed during the channel deepening.

12. A diffusive exchange coefficient of 2.5 X 10^{-4} m^2 day^{-1} was specified. It is not clear in the subject report how this rate (approximately molecular diffusion) was used, or how it may impact model predictions. In subsequent meetings with ATM, it was determined that this was a pore water diffusion rate and was not used in predictions.

13. A reaeration rate of 2.5 day^{-1} was specified, as stated in the subject report, rather than using one of the alternative methods included in the model to compute the rate. The O'Connor-Dobbins formulation was used to compute reaeration rates in previous modeling studies, but the computed rates are not known and can not be compared to the specified value. In subsequent meetings with ATM, it was determined that the value was specified since it was not clear which combinations of depths and velocities should be used in formulations for computing reaeration.

14. Photosynthesis and respiration rates were not specified. These rates were used in previous modeling studies but were considered to be minor components of the total oxygen dynamics, as suggested in this study.

15. Ammonia or nitrogenous BOD (NBOD) were not included in simulations, although they were in previous modeling studies.

16. No comparisons were provided in the subject report for predicted BOD concentrations, for either a quantitative or qualitative evaluation. In subsequent meetings, it was indicated that at least qualitative comparisons of BOD predictions were made, and open boundary conditions (rather than loads) adjusted to obtain a qualitative agreement.

17. The dissolved oxygen model predictions were not compared to observed time-varying data in the subject report, as were salinity predictions. Instead, model predictions were compared to selected percentile frequencies similar to comparisons provided in tables for salinity. No statistical comparisons were provided (means, maximum, minimum, standard errors, etc.) as for salinity predictions. The comparisons between model predictions did seem to exhibit a reasonable degree of accuracy, in comparison with mean values, given that this is a simplified application, as indicated in the report. Typically, the median relative error of detailed dissolved oxygen model applications is on the order of 10 %, or about 0.5 mg/L. The relative error associated with a screening level study, such as performed for this project, would be expected to be considerably greater.

18. It is not known if the conditions to which the model was calibrated and applied represent critical conditions for the estuary. Conditions measured by the Georgia EPD in 1989 and 1990 (EPD 1990, 1991) indicate pockets of low DO water over relatively large areas. Unlike a riverine system, the critical conditions may not be those with the lowest flow, but rather those that may

tend to trap low DO water, or oxygen demanding materials, in certain areas, such as was observed in 1989 and 1990.

19. The model was calibrated to percentile frequencies, rather than absolute values. Therefore, it appears to have been calibrated to represent average rather than extreme conditions. For example, tidally averaged observations (Table 4-2) at the 10 percentile frequency were generally above 3.0 mg/L, while instantaneous values (e.g. Figure 4-6-7) of less than 2.0 mg/l were observed. The applicable DO standards are instantaneous values, rather than averages.

20. The temperature conditions used in the application of the dissolved oxygen model were not specified in the subject report. During subsequent meetings, it was determined that temperature was specified, based upon field data collected as part of this study, and not simulated.

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PROTECTION OF INSTREAM DISSOLVED OXYGEN

Decisions about instream dissolved oxygen (DO) protection, including: water quality criteria, NPDES permit limits and State Water Quality Certifications are appropriately made by considering DO impacts at DO-stressful ("critical") conditions. Critical conditions typically include specified water temperatures, stream flows, segment boundary conditions and (for tidal segments) tide ranges.

The normal approach for considering the DO impact of a proposed action is to construct and calibrate an appropriate water quality model using field data that are as close to DO-critical conditions as possible. Next, the "field-calibrated model" is adjusted to simulate selected combinations of critical conditions. This critical-conditions model" is then used to predict the water-quality impact of proposed actions-

In the DEIS for the proposed Harbor expansion, there are no critical conditions DO simulations. The DO impact of the proposed project is evaluated only within the context of the 1997 field-calibrated model which is not representative of critical conditions for DO. This lack of critical conditions DO projections for the proposed project is a significant shortcoming that needs to be addressed in order to reasonably consider DO impacts and potential mitigation measures as part of the project.

Georgia EPD has previously assumed a DO-critical water temperature of 300C for Savannah Harbor with a 7Q 10 low flow for August (assumed to be the hottest month) at the Clyo gage. (EPD _____). Figure 1 presents average (2-year return) and extreme (10-year and 25-year return) seasonal highs of daily average air temperatures at the Savannah Airport for 1-day to 21-day durations. Figure 2 compares the 7-day moving average of daily air temperatures in Savannah during the 1997 DEIS field sampling period to the 7-day duration daily air temperature statistics for long-term record (1954-1997). Figure 2 indicates that daily air temperatures during the 1997 sampling period were well below (5 to 150F below) the average (2-year return) and extreme (10-year return) expected high temperatures. During September 1997, when special regulated low-flow conditions were arranged, the air temperatures in Savannah, already well below seasonal norms, were rapidly decreasing. This rapid decrease temperature decrease in September 1997 was reflected in the water temperature data reported in the DEIS. The rapid
decrease in temperatures during the 1997 study period raises concern that vertical mixing may have been impacted by transient temperature-induced density gradients that would not exist during critical high temperature conditions.

Georgia's instream DO criteria are applicable for all streamflows exceeding the 7Q1O low flow except for flow-regulated stream segments where the DO criteria are applicable for all flows. While the Savannah River is definitely a regulated segment downstream from Clark Hill Dam, EPD has previously used the August 7Q1O low flow as a DO-critical low flow condition for Savannah Harbor. Using the period of streamflow record (Clyo gage) from 1954 (after Clark Hill Dam was operating) through 1997, low-flow frequency analyses were conducted. Figure 3 depicts seasonal (May-October) low flows for normal (2-year return) and extreme (10-year and
20-year) low-flow conditions as well as the "period of record" extreme low flows recorded at the Clyo gage. The record daily low flow is 4400 cfs (July 22, 1988) and the seasonal (May-October) 7Q1O is 5,300 cfs-

Figure 4 compares the 7-day moving average of daily streamflow at the Clyo gage during the 1997 DEIS field sampling period to the 7-day duration low-flow statistics. In July and August of 1997, streamflows were significantly higher than normal low-flows. But as a result of special release

arrangements at Clark Hill Dam, 7-day average flows were intentionally held at, or slightly below, the August 7Q10 of 6050 cfs for approximately two weeks in September 1997 to create a critical low-flow condition. One possible concern with this created low-flow condition is the water quality "memory" of the system related to higher flows immediately preceding the special low flow conditions of September.

As for critical tide conditions, EPD has previously assumed that Spring tides are the most DO-stressful tides because higher high tides push saline water further upstream and thereby reduce DO saturation concentrations. While this may be the case, it would be prudent to evaluate both Spring tides and Neep tides to be certain that density-induced DO gradients are properly considered.

Figure 1
Savannah International Airport
High Temperature Reference Frame May-October Season
Period of Record 1954-1997

This figure was a graph showing how the Daily Average Temperature varied with Duration.

Figure 2
Daily Average Air Temperature from the Savannah
International Airport, Savannah, Georgia Comparison of 1997 7-Day
Moving Average to
7-Day High Temperature Statistics
Period of Record 1954-1997

This figure was a graph showing how the Air Temperature varied with Month.

Figure 3
Savannah River at Clyo Gage
Low Flow Reference Frame May-October Season
Period of Record 1954-1997

This figure was a graph showing how Flow varies with Duration.

Figure 4
Mean Daily Streamflow Savannah River at Clyo Gage
Comparison of 1997 7-Day Moving Average to
7-Day Low Flow Statistics
Period of Record 1954-1997

This figure was a graph showing how Flow varied with Month.

APPENXIX B

Supplemental Oxygenator of Savannah Harbor

CONCEPTUAL DESIGN

Prepared by Dr. R. E. Speece
Vanderbilt University
July 2, 1998

BACKGROUND

Natural reaeration of water bodies is directly related to turbulence at the air/water interface and inversely related to depth of the water column. Savannah Harbor is characterized by a pooled, flat water surface with little turbulence except for tides. Natural reaeration is currently affected by the 42-ft navigation channel. Plans to deepen the harbor to 50 feet will further reduce dissolved oxygen (DO) conditions in the Lower Savannah River because of the effect depth has on reaeration.

Supplemental oxygenation could mitigate the reduction in DO due to the proposed channel deepening. Examples of installations in the United States where supplemental oxygen is presently used include:

1. **Richard B. Russell Reservoir on the Savannah River:** bubble diffusers have been in operation for a number of years that have the capacity to add up to 100 tons of pure oxygen per day (tons/day). Oxygen is injected into fine bubble diffusers and is efficiently absorbed within the hypolimnion in the free rising bubble plume because of the 140-ft depth.

2. **Tombigbee River:** two supplemental oxygen installations are operated to mitigate a oxygen sag downstream of two industrial discharges. These installations pass water down 175-ft U-Tube shafts. Pure oxygen is injected at the inlet and is carried down to the high hydrostatic pressurization region at the bottom and then back to the water surface. These two systems can dissolve 30 tons/day in a side stream of about 140 MGD containing 50 mg/L of DO in the effluent which is diffused back to the river. These systems had a capital cost of approximately $12,000,000.

3. **California Lake:** this supplemental system utilizes a "Speece Cone" which pulls water from the bottom, passes it down through an inverted cone maintained with an oxygen bubble swarm which raises the DO concentration to 100 mg/L with the cone sitting on the bottom at 100 feet. The highly oxygenated water is then discharged through a diffuser on the bottom of the lake. This California application can supplement 9 tons/day.

4. **Lake "Soaker" Systems:** this application utilizes plastic tubing similar to the porous hose used in gardens. It is strung along the lake bottom on a support system which includes weights at regular intervals to anchor the hose and buoyancy chambers to keep it suspended off the lake bottom. Pure oxygen is forced into the system and permeates the porous tubing to form a source of small diameter bubbles which rise freely to the surface. Oxygen absorption efficiency is determined by the depth of the water column through which the oxygen rises. When used in lakes with depths exceeding 100 feet, 90 percent absorption is possible. In a 50-ft water column, oxygen absorption could be as much as 70 percent if the alpha factor was one and the water had low salinity and was cold. Fine bubble systems are more adversely affected

by a reduced alpha factor than are the U-Tube or cone applications. Under saline conditions, warm water temperatures (30^0 F), 50-ft depths, and an alpha factor less than one, a "soaker" tube installation for the Savannah Harbor was estimated by a vendor to have an efficiency in the range 65 percent.

Economics favor the use of pure oxygen versus air because the cost of electricity to dissolve a ton of oxygen from air is more than the cost of pure oxygen if the DO target in the side stream exceeds 4 to 5 mg/L. This greatly minimizes the required flow rate in the side stream to produce a given amount of oxygen per day.

FEASIBILITY OF SUPPLEMENTED OXYGENATION FOR SAVANNAH HARBOR

There are two main aspects to oxygen supplementation of a water body -- the oxygenation device itself and the distribution/mixing of the highly oxygenated side stream within the water body. Although Savannah Harbor represents a different configuration than the examples of other installations listed above, the tidal excursions in Savannah Harbor are exceptionally beneficial for distribution/mixing of the oxygenated water. Tidal excursions allow for the installation of a number of fixed oxygenation devices several miles apart and could provide for relatively uniform distribution of the supplemented oxygen. Fewer, larger oxygenation devices also allow for economy scale.

OXYGENATION DEVICES

Oxygen, even pure oxygen, is relatively insoluble and requires special care in the design of an oxygenation device that will achieve efficient oxygen absorption. The efficiency of absorption is key because the cost of pure oxygen is significant ($100/ton). Nominally, oxygen bubbles must be retained in water contact for about 60 to 100 seconds to achieve 80 to 90 percent absorption. There are three devices that have proven to be capable of efficient oxygen absorption: the U-Tube system, the Speece Cone, and "soaker" bubbler systems.

U-Tube Oxygenation System

This system incorporates the passage of oxygen bubble/water mixture down a deep shaft (e.g., about 200 feet) and back to the surface. The prolonged bubble contact time and the hydrostatic pressurization at depth achieve efficient oxygen absorption and very high DO concentrations in the discharge.

Speece Cone

This system incorporates a downward flow of water through an expanding cone. The high inlet velocity prevents the oxygen bubbles from escaping at the top as well as providing turbulence to generate a bubble swarm with exceptionally high oxygen/water interfacial area to enhance the oxygen transfer rate. As the cone expands, the downward water velocity decreases to the point where it is less than the buoyant velocity of the bubbles. Thus, they cannot escape out the bottom and are effectively "trapped" in the cone to enable efficient oxygen absorption efficiency. The DO in the discharge is proportional to the hydrostatic head inside the cone. At 100 feet of pressure depth inside the cone, the effluent DO can be 100 mg/L. At ambient pressure in the cone, the effluent DO would be about 25 mg/L. Therefore, it is advantageous to operate the cone as deep as possible.

"Soaker" Tubing System

This system utilizes porous tubing that would be located in the deepest water possible (e.g., the navigation channels of Savannah Harbor). Vendor-provided sizing information assumes that 3 pounds of oxygen can be dissolved per linear foot of tubing per day at 65 percent oxygen absorption efficiency. Based on that vendor-provided information, the bubbler system would require approximately six miles of tubing in the navigation channel. Drawbacks of this system in a harbor system are related to potential encounters with shipping activity (e.g., anchoring) and annual maintenance dredging activities. The anchoring system would have to be designed to withstand strong currents and the tubing would have a typical life span of only two to four years.

SYSTEM REQUIREMENTS AND COMPARISONS

Preliminary calculations indicate that 50 tons per day would be required to mitigate the DO reduction predicted for the proposed harbor expansion project. This requirement could be met with two U-Tube systems consisting of a 7-ft. diameter concentric pipe inside a 10-ft. diameter shaft 200 feet deep. A flow of 150 MGD would be withdrawn from the harbor by a 500 hp pump through the new intake structure. Pure oxygen would be injected at the top of the 7-ft. diameter pipe and the oxygen bubble/water mixture would flow down to the bottom and back to the surface in the outside annular area. The discharge containing over 40 mg/L of DO would be discharged into the harbor. (Salt water has a lower DO saturation than fresh).

The estimated capital costs for two 25-tons per day U-Tube systems would be $24,000,000 based on capital costs for the Tombigbee River system. High capital costs are related to the intake and diffuser structures that will be required to place the U-Tube system on the shore adjacent to the harbor.

Operating costs are primarily the cost of the pure oxygen which was estimated at $100 per ton or $5,500 per day based on a 90 percent oxygen absorption efficiency. Assuming oxygen supplementation would be required, on average, 100 days per year, annual oxygen costs would be approximately $550,000.

Alternatively, a Speece Cone could be utilized by anchoring cone(s) to pile supports outside the navigation channel. These devices would consist of a cone 25 feet high and 20 feet in diameter at the bottom. Water would be drawn from the harbor and forced down into the top of the cone where pure oxygen will be injected. A 200 hp pump would move 50 MGD of water through the cone. The discharge DO concentration would depend on the water depth at which is operates. If the cone sat in 50 feet of water, the discharge DO would be about 50 mg/L. Such an installation could add 10 tons/day. If the cone is in 25 feet of water, the discharge DO would be proportionately reduced and proportionately more water would have to be pumped through a larger installation to supplement 10 tons per day.

The discharge port at the bottom of the cone would be directed perpendicular to the harbor channel at a discharge velocity of about 20 fps so that momentum of the jet would carry the oxygenated water to the opposite side of the navigation channel. Longitudinal mixing along the navigation channel would be through tidal excursions.

Five of these cones installed at regular intervals along the 15-mile harbor would be required to meet the estimated 50 tons/day. If a 90 percent oxygen absorption efficiency was achieved then 55 tons/day would be required. It was estimated that the total capital costs for five oxygenated cones would less than half of the $24,000,000 estimated for the two U-Tube systems.

A "soaker" tubing system that would provide 50 tons/day would require about six miles of tubing. Based on a 65 percent oxygen absorption efficiency, 75 tons/day would be required to meet the 50 tons/day target.

The present worth of the oxygen at 8% and for 25 years would be a multiplier of 10.7. Therefore, the present worth for oxygen for the U-Tube and Speece Cone would be 10.7 x $550,000/yr = $5,900,000. For the bubbler it would be 10.7 x $750,000 = $8,000,000. If the bubbler had a capital cost of $2,500,000 for a six mile long system and had to be replaced every four years, the annual cost could be .22 x $2,500,00 = $550,000 per year, with an equivalent present worth of 10.7x $550,000 = $5,900,000.

Overall comparison of the three supplemental oxygenation systems.

U-Tube	**Cone**	**Bubbler**
Equipment on Land	Equipment in harbor outside of navigation channel	Equipment within navigation channel
No impacts to shipping	No impacts to shipping	Potential impacts to shipping
Dredging not impacted	Dredging not impacted	Potential impacts from annual dredging
25 year life	25 year life	2-4 year life
90 percent oxygen absorption efficiency	90 percent oxygen absorption efficiency	65 percent oxygen absorption efficiency
Anchoring will not impact	Anchoring will not impact	Anchoring may impact

system	system	system
Two installations over 15 miles of channel	Five installations over 15 miles of channel	Six miles of tubing over 15 miles of channel
Oxygen present worth $5,900,000	Oxygen present worth $5,900,000	Oxygen present worth $8,000,000
System present worth $24,000,000	System present worth <$12,000,000	System present worth $ 5,900,000

Letter response

SAVANNAH SUGAR REFINERY
DIVISION OF SAVANNAH FOODS & INDUSTRIES, INC.
SAVANNAH, GEORGIA 31498-4710

Date: July 7, 1998

1. COMMENT: At the outset we wish to stress that it is not our intention to compromise this harbor deepening project. Rather we have identified a number of concerns that we believe can and must be addressed to ensure that the integrity of the Harbor is protected and that the other users of this resource are not left with the responsibility of mitigating any impacts that the Project may have on the Savannah River.

RESPONSE: No response necessary.

2. COMMENT: Comment Summary -- The Project is projected to lower concentrations of DO in affected areas of the Savannah River to concentrations below those permissible under GA law. In addition, the Project's reduction of DO concentrations violates anti-degradation principles central to GA's, SC's, and federal regulatory schemes designed to protect water quality. The Project is also predicted to increase salinity levels in the river in a manner that will substantially and negatively impact the undersigned. Further, the Corps' use of river modeling with respect to Project impacts on DO and salinity levels contain numerous deficiencies. Savannah Foods believes that without mitigation features to alleviate the negative impacts the Corps' discussions of the Project and Project impacts do not comply with the requirements of NEPA. Savannah Foods believes that the Project should proceed only if cost estimates for such mitigation measures are properly included in the Final Feasibility Study and a commitment to develop a Tier II EIS is included in a final EIS that responds to their many concerns.

RESPONSE: See responses to individual statements of the comment summary (Comments 2, 4, 5, 6, 7, and 9.9).

3. COMMENT: State and Federal Laws Implicated by the DEIS -- Expanding the Savannah Harbor as proposed in the DEIS does not comply various state and federal statutes, as well as the Corps' own regulations governing such projects. A discussion of the nature of these violations is briefly set forth below.

RESPONSE: The EIS complies with all regulatory requirements.

4. COMMENT: (A). The Project Predicts Violations of State DO Criteria -- The hydrodynamic model which has been used predicts that the Project will reduce concentrations of DO present in affected areas of the Savannah River in an amount up to 1 mg/L. According to the DEIS, the proposed dredging to a depth of 50 feet in the Front River

"and, consequently higher stratification, [will] cause local reduction in the overall water column reaeration due to a reduced vertical mixing and increased distance from the bottom layers to the surface." The DEIS also notes that in the 50th percentile DO impacts increase between River Miles 12 and 20.5 to a maximum impact of 0.9 mg/L at the highest estimated flow rate; ninetieth percentile impacts indicate a reduction in DO concentrations of up to 1 mg/L near River Mile 17.

The predicted reduction in DO concentrations may cause the affected areas of the Savannah River to drop below the minimum DO concentrations established by the State of GA. Because the Project may reduce DO concentrations in violation of GA's WQ standards, the Corps should reevaluate its proposed dredging plans in order to ensure compliance with such standards.[4]

RESPONSE: In order for the project to proceed a 401 certification will need to be issued which evaluates the project impacts upon the water quality regulations of the State of Georgia. In addition, the project will mitigate for any changes in DO caused by the deepening.

5. COMMENT: (B). The Project Violates State and Federal Anti-Degradation Principles -- The Project, by reducing DO concentrations below those permitted under GA law, violates that State's anti-degradation mandate. In addition, because the Project will degrade the quality of the Savannah River in terms of DO, the Project violates the anti-degradation principles of the SC Pollution Control Act and of the Federal Water Pollution Control Act.

RESPONSE: In order for the project to proceed a 401 certification will need to be issued which evaluates the project impacts upon the water quality regulations of the State of Georgia. In addition, the project will mitigate for any changes in DO caused by the deepening.

6. COMMENT: (C). The Project May Result in a Harmful Increase in Chloride Levels in the Lower Savannah River -- One significant side effect of the Project is predicted increase in salinity. According to the DEIS, the Project will, in all likelihood, cause chloride levels to increase proximate to the City of Savannah's raw water intake. Any increase in the fresh water chloride content will have a significant economic impact on all industrial users.[5]

Furthermore, an increase in chloride concentrations will result in increased corrosion, a higher rate of equipment failure, and product quality problems at the plants of certain stakeholders. Any facility which emphasizes the re-use of process water will be placing itself at greater risk of economic harm when including non-process-elements, including additional chlorides, in its processes. Regrettably, the economic analysis fails to address the above or similar costs to stakeholders who use Industrial and Domestic water for boilers or for the direct processing of products.

The DEIS attempts to downplay the significant impact that increased concentrations of chloride will have on I&D water systems by suggesting that affected intakes can be moved or that the flow rate into such intakes can be artificially increased. In its Comments to the Corps on the Project, however, the City of Savannah estimates the cost of water intake relocation to be approximately $46 million. The substantial amount of money required to

compensate for the predicted change in chloride concentrations warrants additional attention in the EIS.

RESPONSE: A plan of study has been proposed and presented to the City of Savannah to quantify any increases in the chloride concentration at their raw water intake due to the proposed deepening project. This Plan of Study is presently under review by the City of Savannah. This study is to be implemented during the CED phase of the project and the results of this study will be presented in the Tier II EIS and a separate stand alone report. This work will be completed during the CED phase of the project. If the study identifies increases in the Chloride Concentrations at the City of Savannah Intake due to the proposed project, mitigative action will be taken. The $46 million dollar cost proposed by the City of Savannah to mitigate for increases in chloride concentrations at their intake has been factored into the project.

7. COMMENT: (D). GPA's Modeling Efforts are Deficient with Respect to DO, Salinity, and Other Crucial Impacts of the Project on the Environment -- GPA used several models in order to predict Project impacts on DO, salinity, and other crucial ecological factors. In the limited time available to it, the Members have been able to solicit the views of Law Engineering and Environmental Services, Inc. and Dr. James L. Martin, Ph.D., P.E., of AScI Corporation, on the Corps' modeling efforts. The evaluation of the Corps modeling efforts are set forth as Appendix A to these comments.

RESPONSE: Review of the Salinity and Dissolved Oxygen Model has been done by experts representing the United States Fish and Wildlife Unit (Salinity), the Environmental Protection Agency (Salinity and Dissolved Oxygen), as well as James Martin of ASCI for the local industries and the Chamber of Commerce (Salinity and Dissolved Oxygen). The United States Fish and Wildlife representative has agreed that the salinity model as presented in the EIS is sufficient for evaluating the project impacts. The EPA representative has identified that both the salinity and dissolved oxygen model is sufficient for evaluating the project impacts. James Martin in a meeting identified that the salinity model as applied is sufficient for evaluating the project impacts. He also agreed that the model is an appropriate tool for evaluating the impacts to dissolved oxygen but he feels that certain simplifying assumptions in the application of the model are not sufficient. Additional refinements to the dissolved oxygen model are to be completed within the CED phase and will be reported within the Tier II EIS to be completed during the CED phase. Additionally measurements made in the Summer of 1997 identify that the system at present violates the state standard of a dissolved oxygen concentration not less than 3.0 mg/L at any time..

8. COMMENT: (F). The Corps' Letter response of the Project does not Comply with NEPA and its Implementing Regulations -- NEPA requires that federal agencies include in proposals for "major Federal actions significantly affecting the quality of the human environment a detailed statement" of, among other things: (1) the environmental impact of the proposed action; (2) any adverse environmental effects which cannot be avoided should the proposal be implemented; and (3) alternatives to the proposed action. Such agencies must also "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources."

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

9. COMMENT: The April, 1998 DEIS prepared by the Corps is insufficient for purposes of NEPA because, among other things,

(1) the Corps does not adequately discuss the environmental impacts of dredging to depths other than to the Corps-recommended 50-foot depth,
(2) the Corps does not identify any adverse environmental effects which cannot be avoided should the proposal be implemented, or which could be avoided through dredging to depths other than to 50 feet;
(3) the Corps does not state that its recommended alternative will, in all likelihood, violate the law of the State of Georgia;
(4) the Corps does not discuss DO or salinity concentrations at depths other than 50 feet;
(5) the Corps does not adequately discuss the impacts of the Project on the shortnose sturgeon and striped bass;
(6) the Corps has not conducted any studies of alternatives to its recommended 50 foot dredging depth which might resolve conflicts related to the existing, competing uses of the natural resources of the Savannah River;

(7) the Corps does not consider any mitigation measures related to the projected increase in salinity and decrease in DO for any of the alternatives;
(8) the Corps does not identify reasons why it selected the 50 foot depth alternative when the greatest benefits versus costs appear at a depth of 46 feet;
(9) flaws in the Corps' model prevent the Corps from providing an accurate statement concerning the Project's environmental impacts;
(10) given the Project's scope and complexity, the Corps does not provide sufficient time for the public to comment on the DEIS; and
(11) given the Project's scope, complexity, and significant environmental impacts, the Corps, as a general matter, has not conducted sufficient information gathering for the DEIS to meet NEPA's "detailed statement" requirement.

RESPONSE:

9.1 The proposed scope of the DEIS was stated as a "worst case scenario" addressing the potential impacts of the deepest alternative, a 50 foot channel. All other alternative project depths would have less impact. Additional studies will be performed in the CED phase to evaluate alternative depths.

9.2 The DEIS discloses the expected impacts of the proposed project and describes both impact avoidance and mitigation features that are included in the proposed project to address those concerns. Further studies in the CED phase will evaluate the impacts of alternative depths and be used to develop the final mitigation plan, which will be subject to a Tier II EIS.

9.3 The EIS contains the requirement to receive a 401 Water Quality Certification from the State of Georgia.

9.4 Additional studies will be performed in the CED phase to evaluate alternative depths.

9.5 The project provides full disclosure of potential adverse impacts to these species, especially impacts from DO decrease and salinity increase, as well as proposals for avoiding these impacts.

9.6 Additional studies will be performed in the CED phase to evaluate alternative depths.

9.7 The EIS will be revised to provide mitigation of project impacts on chloride levels at the City's water intake and dissolved oxygen levels in the Savannah Harbor. The estimated costs of mitigation have been included in the project costs.

9.8 The DEIS will be revised to present the LPP.

9.9 Review of the Salinity and Dissolved Oxygen Model has been done by experts representing the United States Fish and Wildlife Unit (Salinity), the Environmental Protection Agency (Salinity and Dissolved Oxygen), as well as James Martin of ASCI for the local industries and the Chamber of Commerce (Salinity and Dissolved Oxygen). The United States Fish and Wildlife representative has agreed that the salinity model as presented in the EIS is sufficient for evaluating the project impacts. The EPA representative has identified that both the salinity and dissolved oxygen model is sufficient for evaluating the project impacts. James Martin in a meeting identified that the salinity model as applied is sufficient for evaluating the project impacts. He also agreed that the model is an appropriate tool for evaluating the impacts to dissolved oxygen but he feels that certain simplifying assumptions in the application of the model are not sufficient. Additional refinements to the dissolved oxygen model are to be completed within the CED phase and will be reported within the Tier II EIS to be completed during the CED phase. Additionally measurements made in the Summer of 1997 identify that the system at present violates the state standard of a dissolved oxygen concentration not less than 3.0 mg/L at any time.

9.10 A 15 day extension to the comment period was provided.

9.11 The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

10. COMMENT: If finalized, the DEIS, as currently presented, would no doubt, be deemed by any reviewing court to be arbitrary, capricious, or otherwise not in accordance with the law.

RESPONSE: The EIS has been revised to address these concerns.

11. COMMENT: Actions Needed – For all the reasons set forth above, the Project, as proposed, should not go forward. Savannah Foods will consider supporting the Project if the following actions are undertaken by the Corps and GPA.

A. Mitigation measures are undertaken to eliminate the predicted DO deficit. Savannah Foods believes that funding must be included in the project to undertake mitigation measures related to the predicted DO deficit. To support this effort, Savannah Foods has, through the Chamber of Commerce, commissioned a study of mitigation measures that could eliminate the predicted decrease in DO. Law, assisted by a Vanderbilt University professor, has developed a Preliminary Feasibility Study, a copy of which is attached as Appendix B. In this study, Law identified two alternative mechanisms for providing additional aeration to the River. Savannah Foods believes that, of the mitigation mechanisms, the "U-Tube" alternative should be included in the Project as the preferred mitigation measure. It should be noted, however, that although Savannah Foods recommends the most expensive of the suggested mitigation mechanisms, the Corps should investigate and consider all reasonable alternatives in a manner consistent with NEPA as a part of its FEIS. The Corps should further ensure that the Draft Feasibility Study and DEIS are revised to include specific, independent line-items for any DO mitigation mechanism(s) selected in order to ensure that sufficient funds for such mitigation are both authorized and appropriated by Congress as a part of its review of the Project.

B. Mitigation measures are undertaken to avoid the negative effects of increased chloride levels. The City has already provided comments regarding the necessity for mitigating the predicted increase in chloride levels. Savannah Foods agrees with these comments, and believes that the Project should proceed <u>only</u> if funds are included to undertake the necessary mitigation measures with respect to the predicted chloride increase (<u>i.e</u>., the Corps should ensure that the City's raw water intake structure is relocated to an area where chloride levels will not be increased). The Corps should further ensure that the Draft Feasibility Study and DEIS are revised to include specific, independent line-items for any DO mitigation mechanism(s) selected in order to ensure that sufficient funds for such mitigation are both <u>authorized</u> <u>and</u> <u>appropriated</u> by Congress as a part of its review of the Project.

C. A Final EIS is developed by the GPA and the Corps and published for public comment. Savannah Foods believes that a final EIS that corrects the noted deficiencies should be published and subjected to public comment. If the comments, as set forth above, are not addressed in the final EIS, the Project cannot proceed on sound legal footing. More specifically, as noted above, the Corps should include specific, independent line-items in the EIS and Feasibility Study where necessary to ensure that sufficient funds are authorized and appropriated by Congress to mitigate any unavoidable adverse environmental impacts caused by the Project. To the extent that the Corps cannot provide in the EIS a detailed discussion of the costs and engineering requirements of any mitigation measures selected by the Corps to remedy the impacts of the Project, then the Corps should provide such discussion in a Tier II EIS and make such discussion available for public review and comment.

D. Consult a Technical Advisory Committee Concerning Certain Aspects of the Project Before Completing the EIS -- Before the Corps proceeds with its evaluation of the mitigation measures noted above, Savannah Foods requests the establishment of a Technical Advisory Committee and seeks to be included on such a Committee. In particular, Savannah Foods seeks to engage in a dialogue with the Corps and GPA concerning: (1) the model used to develop the DO and salinity data relied upon by the

Corps; (2) the DO mitigation / reaeration project; and (3) the chloride mitigation project, including the relocation of water-intake structures.

RESPONSE: 11.A The estimated cost for the most expensive mitigation alternative presented, the "U-tube", has been included in the project costs. Further studies will be conducted in the CED phase to determine the final mitigation plan, which will be subject to a Tier II EIS.

11.B The EIS will be revised to include further studies of the cause and effect relationship between salinity increases from the project and chloride levels at the City's water intake. The project will also include costs for the potential mitigation efforts resulting from an increase in chlorides. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

11.C The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

11.D The EIS has been revised to provide a mitigation process which includes participation by various stakeholders to address these issues.

12. COMMENT: Conclusion – Savannah Foods does not write these comments in order to thwart the Corps' efforts to ensure that the harbor remains a viable commercial port of call both now and in the future. The purpose of these comments is to assist the Corps and GPA with consideration of reasonable alternatives and mitigation measures, which will not result in a shift of the costs of maintaining the Savannah as a multi-use estuary. Savannah Foods urges the Corps and GPA to explore such alternatives and measures and to include them in the Project. Once incorporated into the Project.

RESPONSE: No response necessary.

APPENDIX A:

Review: Hydrodynamic and Water Quality Modeling of the Lower Savannah River Estuary by ATM and ASA

NOTE: The review of the water quality modeling that was included in Stone Container's letter as Appendix A is identical to that attached to the July 7, 1998, letter from the Savannah Area Chamber of Commerce. Responses to the comments contained in the review can be found in this Enclosure as the responses to the Chamber of Commerce letter.

APPENDIX B:

Supplemental Oxygenator of Savannah Harbor – Conceptual Design; prepared by Dr. R. E. Speeces, Vanderbilt University, July 2, 1998

NOTE: The conceptual design that was included in Stone Container's letter as Appendix B is identical to that attached to the July 7, 1998, letter from the Savannah Area Chamber of Commerce. Responses to the comments contained in the review can be found in this Enclosure as the responses to the Chamber of Commerce letter.

Savannah Traffic Club, Inc.

SAVANNAH
Traffic
CLUB, INC.

July 1, 1998

Mr. William Bailey
U.S. Army Corps of Engineers
Planning Division
Environmental Research Branch
P.O. Box 889
1 00 W. Oglethorpe Avenue
Savannah, GA 31406

Dear Mr. Bailey:

On behalf of the Savannah Traffic Club, I/we are writing in support of the proposed Savannah Harbor Deepening Project.

In recent years, the size of ships utilizing the Port of Savannah has grown far beyond levels previously predicted. Specifically, Savannah is seeing the large containerships today that were previously not projected to call the port for another 20 years. As a result of this growth in vessel size, the Savannah River Navigation Channel is not capable of adequately accommodating many of the ships now calling on the port. This inadequacy in channel depth forced over 52% of container ships serving the port of Savannah in 1996 to either load to less than capacity (light-load) or wait until high tide to transit the channel. Such operational constraints lead to dramatic increases in transportation costs which are subsequently passed on to consumers and can ultimately force port users to seek more readily accessible facilities. Furthermore. as the world marketplace continues to grow, so too will these larger ships.

According to Savannah Harbor Deepening Feasibility Study Report, significant changes will occur in the fleet of vessels utilizing the Port of Savannah, and the current 42' mean low water (mlw) channel depth will become increasingly inadequate. According to Tables 5-7, 5-8, and 5-9 of that Report:

1. Calls by vessel of less than 38 feet of design draft will increase by over 640 percent.
2. Deep draft vessel (those drafting more than 38 feet) calls will increase by over 445 percent.
3. The first Post-Panamax II vessel will call Savannah within the next decade if the channel is deepened to 46 feet in depth or greater.

4. Post-Panamax vessels will not be placed in Savannah-calling rotations unless the channel is greater than 44 feet in depth or vessels are operated light-loaded (greater or equal to seven feet.)
5. Overall vessel calls will increase by 530 percent, averaging almost 4 percent per year.

These predictions clearly show the increased demands that will be placed on the Port of Savannah and the capacities necessary to accommodate those demands.

Furthermore, a 1997 Economic Impact Study showed that Georgia's public and private port terminals directly and indirectly impact 80,100 jobs, $1.8 billion in wages, $23 billion in revenue, and $585 million in state and local taxes annually. The Port of Savannah is the key component in the generation of those dynamic figures and serves as a conduit for balanced trade between over 20 states in the Southeast and the international marketplace. Thus, maintenance of an adequately navigable shipping channel at the port is critical to Georgia and the United States. Failure to meet the requirements of vessels utilizing the Port of Savannah now and into the future will pose serious economic implications to our shipping industry.

To insure that the current success and future growth opportunities of Georgia's shipping industry are preserved, I/we urge the U.S. Army Corps of Engineers and the Congress to move for immediate authorization of the Savannah Harbor Deepening Project via the Water Resource Department Act of 1998.

Sincerely,

Tony Noles
lst Vice President

cc: Senator Paul Coverdell
Senator Max Cleland
Congressman Jack Kingston

Letter response

Savannah Traffic Club, Inc.
P.O. Box 9295
Savannah, Georgia 31402

Date: July 1, 1998

1. COMMENT:
We support the proposed Savannah Harbor Deepening Project.

RESPONSE: No response necessary.

2. COMMENT: In recent years, the size of ships using the Port has grown far beyond levels previously predicted. Specifically, Savannah is seeing the large containerships today that were previously not projected to call the port for another 20 years. As a result of this growth in vessel size, the Navigation Channel is not capable of adequately accommodating many of the ships now calling on the port. This inadequacy in channel depth forced over 52% of container ships serving the Port in 1996 to either load to less than capacity (light-load) or wait until high tide to transit the channel. Such operational constraints lead to dramatic increases in transportation costs that are subsequently passed on to consumers and can ultimately force port users to seek more readily accessible facilities. Furthermore, as the world marketplace continues to grow, so too will these larger ships.

RESPONSE: Concur.

3. COMMENT: According to Feasibility Report, significant changes will occur in the fleet of vessels using the Port of Savannah, and the current 42' MLW channel depth will become increasingly inadequate. Tables 5-7, 5-8, and 5-9 of that report describe several ways in which the vessel calls will change in thew future. These predictions clearly show the increased demands that will be placed on the Port of Savannah and the capacities necessary to accommodate those demands.

RESPONSE: Concur.

4. COMMENT: Furthermore, a 1997 Economic Impact Study showed that Georgia's public and private port terminals directly and indirectly impact 80,100 jobs, $1.8 billion in wages, $23 billion in revenue, and $585 million in state and local taxes annually. The Port of Savannah is the key component in the generation of those dynamic figures and serves as a conduit for balanced trade between over 20 states in the Southeast and the international marketplace. Thus, maintenance of an adequately navigable shipping channel at the port is critical to Georgia and the United States. Failure to meet the requirements of vessels using

the Port of Savannah now and into the future will pose serious economic implications to our shipping industry.

RESPONSE: Concur.

5. COMMENT: To insure that the current success and future growth opportunities of Georgia's shipping industry are preserved, we urge the Corps and the Congress to move for immediate authorization of the Deepening Project via the WRDA of 1998.

RESPONSE: No response necessary.

Sea Garden Seafoods, Inc.

SEA GARDEN SEAFOODS, INC.
P.O. BOX 181
MERIDIAN, GEORGIA 31319
Phone 912-832-4437
FAX 912-832 6834

June 20, 1998

U.S. Corps of Engineers
100 West Oglethorpe Street
PO Box 889
Savannah, Georgia 31402

Re: Dredging of the Savannah Ship Channel from 42 to 50 feet.

Dear Sir:

It would be satisfying to think that, at some time in history, the Corps of Engineers would consider the cost of damage to ecosystems as an offsetting cost when looking at the cost benefits of projects that work on the assumption that "bigger is always better".

We feel sure that the cost of destroying or damaging thousands of acres of wetlands has not been considered to an appropriate extent. The news media quotes the Corps. as stating that "7000 jobs" depend upon the Savannah Harbor. There are approximately 40,000 jobs, as well as " a way of life", that depend upon a healthy ecosystem. These jobs are in tourism, sports fishing, recreational activities, and commercial fishing and their infrastructure.

There is no doubt, in many minds, that this dredging will have a negative impact upon the short nosed sturgeon. Via copy of this letter, we are requesting, through NMFS and the US Fish and Wildlife Service, that a Section 7 study be done on this project under the Endangered Species Act.

There are, currently, studies being started by Dr. Jack Blanton at the Skidaway Institute of Marine Science to "model" affects of change upon salinity and the salt/fresh water interface in Coastal Georgia. It would be bad policy to proceed with something like this project until the results of this study are concluded and "good science" is available.

We are convinced that, if the TOTAL cost to society and the ecosystem are considered, that there would be no justification for proceeding with this project. Hopefully, the project will not be approved.

Sincerely,

Jack L. Amason

CC: NWS

US Fish and Wildlife Service
South Atlantic Fishery Management Council

Dicussion

SEA GARDEN SEAFOODS, INC.
P.O. BOX 181
MERIDIAN, GEORGIA 31319

June 20, 1998

1. COMMENT: The Corps of Engineers should consider the cost of damage to ecosystems as an offsetting cost when looking at the cost benefits of projects that work on the assumption that "bigger is always better".

RESPONSE: The Corps does include potential environmental impacts in its evaluation of the feasibility and environmental acceptability of proposed projects. The NEPA process, including preparation of an EIS, is designed to identify and disclose potential environmental impacts, so they are included in the decision-making process.

2. COMMENT: We feel sure that the cost of destroying or damaging thousands of acres of wetlands has not been considered to an appropriate extent. The news media quotes the Corps. as stating that "7000 jobs" depend upon the Savannah Harbor. There are approximately 40,000 jobs, as well as "a way of life", that depend upon a healthy ecosystem. These jobs are in tourism, sports fishing, recreational activities, and commercial fishing and their infrastructure.

RESPONSE: Potential impacts to wetlands – as well as mitigation for those impacts -- are addressed in the EIS. Obtaining the views of the public and natural resource agencies on the adequacy of the proposed mitigation plan is one of the purposes of public review of the DEIS.

3. COMMENT: There is no doubt in many minds that this dredging will have a negative impact upon the shortnose sturgeon. Via copy of this letter, we are requesting, through NMFS and the US Fish and Wildlife Service, that a Section 7 study be done on this project under the Endangered Species Act.

RESPONSE: Section 5.6.1 of the DEIS contained a summary of the impacts expected to shortnose sturgeon. Section 6.13 of Attachment A to the DEIS is the portion of the Biological Assessment of Threatened and Endangered Species that contains an evaluation of the impacts to this species. A project feature was included to provide habitat further upriver for this species. Savannah District had requested the Protected Species Division of the Southeast Regional office of the NMFS to review the proposed project under Section 7 of the ESA. The NMFS administers the ESA for this species. The project will include whatever provisions the NMFS believes are necessary to protect this species.

4. COMMENT: Studies are being started at the Skidaway Institute of Marine Science to "model" affects of change upon salinity and the salt/fresh water interface in Coastal Georgia. It would be bad policy to proceed with something like this project until the results of this study are concluded and "good science" is available.

RESPONSE: Evaluation of the proposed project will use the best information that is available at the time. Should the results of the referenced study become available before final decisions are made concerning this project, they would be incorporated into the decision-making process..

5. COMMENT: If the total cost to society and the ecosystem are considered, there would be no justification for proceeding with this project.

RESPONSE: Evaluation of the feasibility and environmental acceptability of the proposed project includes all costs that can be reasonably be certain to occur as a result of project implementation.

Southern Bulk Industries, Inc.

CONBULK MARINE TERMINALS GROUP
SOUTHERN BULK INDUSTRIES
A subsidiary of Peeples Industries, Inc.
Orlean Building; 6001 Chatham Center Drive; Suite 350
Savannah, Georgia 31405
P.O. Box 2647
Savannah, Georgia 31402

June 19, 1998

Mr. William G. Bailey
U.S. Army Corps of Engineers, PD-E
Post Office Box 889
Savannah, GA 31402-0889

Re: GPA Savannah Harbor Expansion

Dear Mr. Bailey:

We are opposed to the GPA Expansion for the Savannah Harbor.

We are concerned with the possibility of one way ship traffic and its adverse impact on our shipping customers. We are concerned with the negative impact on the Savannah River water quality with increased salinity. This will reduce the dissolved oxygen which impacts maintenance agitation dredging. We are concerned with the impact on UDS's in the upper harbor and what this will do to future maintenance dredging costs for the Savannah Harbor.

In conclusion, we oppose this project because of the negative impact on our present deep water terminal business; the negative impact on our present manufacturing business; and the negative impact on our present maintenance dredging.

Sincerely,

SOUTHERN BULK INDUSTRIES, INC.

Frank K. Peeples, Jr.
Executive Vice President

Letter response

CONBULK MARINE TERMINALS GROUP

SOUTHERN BULK INDUSTRIES
A subsidiary of Peeples Industries, Inc.
Orlean Building; 6001 Chatham Center Drive; Suite 350
Savannah, Georgia 31405
P.O. Box 2647
Savannah, Georgia 31402

June 19, 1998

1. COMMENT: We are opposed to the GPA Expansion for the Savannah Harbor.

RESPONSE: No response necessary.

2. COMMENT: We are concerned with the possibility of one way ship traffic and its adverse impact on our shipping customers. We are concerned with the negative impact on the Savannah River water quality with increased salinity. This will reduce the dissolved oxygen which impacts maintenance agitation dredging. We are concerned with the impact on UDS's in the upper harbor and what this will do to future maintenance dredging costs for the Savannah Harbor.

RESPONSE: (1) Bank erosion - East Coast Terminal has been in litigation with the District over this issue for several years and comment on this matter is inappropriate at this time.

(2) One-way traffic – The deepened channel will not alter the practices the pilots currently use in bringing Panamax vessels into the harbor. Two way traffic for these vessels will not be restricted and vessels may meet and pass under conditions the pilots determine are safe. It is not possible to design a channel to accommodate two-way traffic for post-Panamax vessels with the development that exists on the banks of the river. Movement of vessels will require coordination when post-Panamax vessels are transiting the project.

(3) Impact on UDS's – The project will not have an adverse impact on the future use of confined disposal sites located in the upper harbor. Disposal area 2A will not be used for the expansion dredging. All material dredged upstream of the Talmadge Bridge will be pumped to disposal area 12A. In addition, the expansion dredging will provide suitable material which can be used for future dike improvement projects.

(4) Impact on future maintenance dredging (DO impacts) – One of the project features includes reaeration of the river to mitigate for the predicted reduction of DO in the river. This feature is being included in the preliminary project design and cost estimates and is being incorporated into the revised project documents and project cost estimate.

3. COMMENT: In conclusion, we oppose this project because of the negative impact on our present deep water terminal business; the negative impact on our present manufacturing business; and the negative impact on our present maintenance dredging.

RESPONSE: No response necessary.

Southern Environmental Law Center

137 E. Franklin Street,

Suite 404

Chapel Hill, NC 27514-3628
919-967-1450
FAX 919-929-9421

Regional Office
201 West Main St., Suite 14
Charlottesville, VA
22902-5065
804-977-4090
FAX 804-977-1483

June 3, 1998

Mr. William Bailey
Environmental Resources Branch, Planning Division
U.S. Army Corps of Engineers
PO Box 889
Savannah, GA 31402

Re: Draft Feasibility Report and Draft EIS for Savannah Harbor Expansion

Dear Mr. Bailey:

Please send a copy of the Draft Feasibility Report and Draft EIS for the Savannah Harbor Expansion Project to me at the above Chapel Hill address as soon as is practicable.

I understand that a request has been made by the U.S. Fish and Wildlife Service to extend the comment period. Please let me know if the comment deadline has been extended.

Thank you very much for your attention to this request.

Very truly yours,

Donnell Van Noppen III
Senior Attorney

DVN/crg

Letter response

Southern Environmental Law Center

137 E. Franklin Street, Suite 404
Chapel Hill, NC 27514-3628

Date: June 3, 1998

1. COMMENT: Please send a copy of the Draft Feasibility Report and Draft EIS for the Savannah Harbor Expansion Project to me at the above Chapel Hill address as soon as is practicable.

RESPONSE: Savannah District sent the report on June 8, 1998.

2. COMMENT: I understand that a request has been made by the U.S. Fish and Wildlife Service to extend the comment period. Please let me know if the comment deadline has been extended.

RESPONSE: Savannah District wrote the Southern Environmental Law Center on June 22, 1998 notifying them that they had extended the review period until July 7, 1998.

Southern Environmental Law Center

137 E. Franklin Street,

Suite 404

Chapel Hill, NC 27514-3628
919-967-1450
FAX 919-929-9421

Regional Office
201 West Main St., Suite 14
Charlottesville, VA
22902-5065
804-977-4090
FAX 804-977-1483

June 19, 1998

Mr. William Bailey
Environmental Resources Branch, Planning Division
U.S. Army Corps of Engineers
PO Box 889
Savannah, GA 31402

Re: Savannah Harbor Expansion

Dear Mr. Bailey:

Thank you very much for promptly sending me the Draft EIS and Feasibility Report for the Savannah Harbor Expansion.

I understand from our telephone conversation earlier this month that a 15-day extension has been granted for the comment period, which will extend the comment period to July 8, 1998, and that a 30-day extension request is pending. The Southern Environmental Law Center, on behalf of the South Carolina Coastal Conservation League, also requests that the comment deadline be extended 30 days, until July 23, in light of the very voluminous studies and the important issues involved.

Please let us know as soon as practicable whether this extension request will be granted.

Very truly yours,

Donnell Van Noppen Ill
Senior Attorney

TVN/ckt

cc: South Carolina Coastal Conservation League

Letter response

Southern Environmental Law Center

137 E. Franklin Street, Suite 404
Chapel Hill, NC 27514-3628

Date: June 19, 1998

COMMENT: I understand that a 15-day extension has been granted for the comment period, which will extend the comment period to July 8, 1998, and that a 30-day extension request is pending. The Southern Environmental Law Center, on behalf of the South Carolina Coastal Conservation League, also requests that the comment deadline be extended 30 days, until July 23, in light of the very voluminous studies and the important issues involved.

RESPONSE: Savannah District wrote the Southern Environmental Law Center on June 22, 1998 notifying them that they had extended the review period until July 7, 1998.

Southern Environmental Law Center (July 7)

Southern Environmental Law Center
137 EAST FRANKLIN STREET SUITE 404 CHAPEL HILL, NC 27514 (919) 967-1450

July 7, 1998

Colonel Joseph Schmitt
District Engineer
Department of the Army
Savannah District, Corps of Engineers

P.O. Box 889

Savannah, GA 31402-0889

Re: Draft Feasibility Report and Draft Environmental Impact Statement for Savannah Harbor Navigation Project

Dear Colonel Schmitt:

The Southern Environmental Law Center ("SELC") submits these comments on behalf of the South Carolina Coastal Conservation League ("SCCCL") and the Coastal Environmental Organization of Georgia Inc. ("CEO") in response to the publication of the Draft Feasibility Report and Environmental Impact studies regarding deepening of the federal navigation project in Savannah Harbor. SCCCL is a statewide environmental advocacy group involved in coastal development, water quality and other environmental issues throughout South Carolina, including on the Savannah River and in the region. CEO is a similar organization formed to address coastal development and environmental issues on the Georgia coast. SELC is a non-profit law firm which represents organizations and individuals working to protect natural resources throughout the Southeast and which has major areas of expertise in coastal and water quality issues and the National Environmental Policy Act ("NEPA"). We appreciate the opportunity to submit these comments on these documents.

INTRODUCTION

As will be discussed in more detail below, the proposed Savannah Harbor expansion project would dredge approximately 36 miles of both the harbor's entrance channel and the Savannah River from the current 42 foot depth to a depth of 50 feet. The purpose of the project is stated to be improving passage for the largest container vessels presently operating and expected to call on the harbor in the future. As will be discussed below, several past harbor modifications involving channel deepening have resulted in increased salinity and decreased dissolved oxygen in the river, causing catastrophic collapse of the striped bass fishery and the habitat available for the endangered shortnosed sturgeon, while also causing the loss of over half of the tidal freshwater marsh which form the centerpiece of the Savannah National Wildlife Refuge. That the proposed deepening will exacerbate these conditions is hardly disputed; instead, the project proposes to attempt to mitigate those adverse consequences by dramatically "re-engineering" the flow of water through the river and the adjoining marshes. The DEIS, however, completely fails to demonstrate that the proposed re-engineering of the river by closing Middle River from Front River will salvage the remaining freshwater marsh or the threatened fisheries. The Draft Feasibility Report is similarly flawed in failing to make a genuine multi-port competitive examination of the wisdom of investing enormous public resources into this dredging project.

These fundamental shortcomings may in part be explained by the fact that both studies were prepared under excessively hasty procedures in hopes of obtaining congressional authorization and funding for the project in the currently pending 1998 Water Resources Development Act ("WRDA") bill. (See Exhibit 1). It is revealing that the Corps'

team which worked on the Draft Feasibility Report won an award for the speed, not the quality, of its work. (See Exhibit 2). These procedures also raise fundamental issues about the Corps' ability to objectively evaluate the work prepared by the Ports Authority and its consultants.

DRAFT FEASIBILITY REPORT

The Georgia Ports Authority conducted a feasibility study to determine whether deepening the channel at Savannah Harbor to accommodate larger container ships was justifiable in light of the significant environmental impacts and large economic investment. The feasibility study was performed pursuant to section 203 of the Water Resources Development Act of 1986 (“WRDA”), 33 U.S.C. 2282 (1986), with the substantial assistance and involvement of the U.S. Army Corps of Engineers, Savannah District. The Feasibility Report, issued upon completion of the study, must comply with all federal laws and regulations pertaining to feasibility studies of harbor navigation projects. The Army Corps of Engineers' Engineering Regulation ("ER") 1105-2-100 and the Water Resource Council's *Economic Principles and Guidelines for Water and Related Land Resources Implementation Studies* ("the *Guidelines*") summarize and implement the applicable laws governing preparation of the Feasibility Report. This letter will address three, related important issues regarding the Draft Feasibility Report: the scope of the study, the identification of volumes of commodity flow, and the required multi-port analysis.

Scope of the Study

NEPA regulations at 40 C.F.R. 1502.4(c)(1) provide that in the preparation of studies or reports, agencies should evaluate the proposal and its scope "geographically, including actions occurring in the same general location, such as body of water, region, or metropolitan area." This provision is echoed in the *Guidelines*, which require the Corps to "define the planning area based on the problems and opportunities and the geographic areas likely to be affected by alternative plans." *Guidelines*, section 1.4.8(b)(2).

The scope of the Savannah Feasibility Report is entirely inadequate in failing to address the economic inter-relationship between the proposed Savannah project and the existing and future conditions at competing ports. The economic feasibility of the proposed project is almost entirely dependent upon developments not only in Savannah shipping but also in the conditions and facilities at competing ports, Instead, the dynamic nature of shipping industry trends and the projected changes at competing ports, not just Savannah, must be considered. The Feasibility Report discusses only the economic benefits to the immediate area, Savannah and the rest of the state of Georgia, of having deep draft container ships servicing the port, but makes no mention of the sensitivity of this forecast of benefits to changes occurring at adjacent ports or other ports which have a thriving shipping industry.

Furthermore, the *Guidelines* direct the Corps to look at the general geographic area in which the project will occur. *Guidelines*, section 1.4.8(b)(2). The geographic area for this study should include the entire South Atlantic coast because that is the geographic area which encompasses Savannah's competitor ports. The geographical nexus is especially

obvious in the case of Charleston and Jacksonville, which are within a 200 mile radius of both Savannah and each other. While the Report provides an analysis of the current operation of those ports and of their pertinent characteristics (see Draft Economics Appendix, Section 5, "Multiport Competitiveness Analysis"), the document fails to assess the effects of the Savannah project on those ports at all, nor, even more importantly, the effects of current and proposed expansion projects at these ports on the economic feasibility of the Savannah project. Knowledge of the baseline characteristics of each of these ports is useful, but the purpose of the Feasibility Report is to examine the feasibility of the proposed activity in light of the future realities. Fulfilling this purpose requires careful projections regarding surrounding ports, not just their baseline condition. If the Savannah Harbor is deepened to accommodate bigger containerships, will shipping companies alter their use at the other ports? Could the other ports accommodate enough of the big containerships to service the region without the expansion at Savannah? How will expansion plans at Freeport, Charleston, Hampton Roads, Wilmington, Jacksonville, and other Atlantic ports affect use of the Savannah port? There are many scenarios which would all have varied environmental and economic impacts on the ports of the region, yet no projections were made as to what these effects might be, and no comparison of these effects for each alternative in the Savannah project was made in the Feasibility Report.

The Corps' engineering regulations state that a study must consider "*diversion from or to adjacent competitive harbors*" and that "there should be adequate discussion of the trade area relative to adjacent ports and any commonality that might exist." ER 1105-2-100 Para 6-78 (Evaluation Procedure Step 1- "Determine the Economic Study Area") (emphasis added). The Draft Feasibility Report wholly fails to meet this requirement. The Report shows no consideration of the economic impacts, problems, or opportunities that might occur in the adjacent competitive ports as a result of the proposed activity, and conversely, does not discuss the effect on this project's feasibility of projects at competing ports. Again, the only discussion of other ports was in comparing the baseline economies and characteristics of Savannah in relation to those ports. Such a comparison is of little use since it blatantly fails to address the key inquiry, which is the feasibility of Savannah Harbor expansion in light of developments at competitive ports.

Volumes of Commodity Flow

"If benefits from economics of ship size are related to proposed deepening of the harbor, the analysis should concentrate on the specific commodities or types of shipments that will be affected." ER 1105-2-100 Para 6-79 (Step 2 - "Identify Volumes of Commodity Flow") The regulation specifically provides that "particular attention should be given to alternative competitive harbors," and "in determining the likelihood of prospective commerce, particular attention should be given to alternative competitive harbors … [and) the adequacy of existing harbor and transportation facilities." ER 1105-2-100 Para 6-79.

The Draft Feasibility Report fails to provide "particular attention" to alternative harbors and the adequacy of the existing harbor. Section 3 of the Draft Economic Appendix of the Feasibility Report forecasts the amount of trade in commodities shipped by container for Savannah and for the South Atlantic Region generally. Once again, the Report fails to apply those forecasts to the different alternatives. The share of the projected trade of

container commodities at Savannah may be different depending on whether the harbor channel is actually deepened, and to what depth. Similarly, the percentages of the commodity flow would be altered at competing South Atlantic ports in each of the possible Savannah alternatives. No comparison of "with project conditions" versus "without project conditions" is present in the Report. Without such an analysis, projected commodity flows mean very little for purposes of assessing the feasibility of the Georgia Ports Authority's proposal.

Multiport Analysis

As part of its National Economic Development ("NED") study, an agency must incorporate a multiport analysis. "This procedure calls for a systematic determination of alternative routing possibilities, regional port analyses, and intermodal networks that may require the use of computer modeling techniques." ER SS6-87 (See also Guidelines, section 2.7.5(a)).

Other regulations express the importance of the multiport analysis as well. The ERs require the feasibility studies to "consider competitive harbors with existing terminal facilities and sufficient capacities as possible alternatives for traffic origination ..." ER 1105-2-100 Para 6-83. In another section, subtitled "same commodity, and origin-destination, different harbor," the ERs and the Guidelines describe what types of scenarios should be assessed by a feasibility study. "This situation occurs where commodities that are now moving or are expected to move via alternative harbors
without the proposed improvement would, with the proposed plan be diverted through the subject harbor. Cost reduction benefits from a proposed plan apply to both new and existing harbors and channels." ER 1105-2-1 00 Para 6-75. (see Guidelines, section 2.7.2(2)).

Reflecting the fundamental problem of the scope of the study, the Feasibility Report lacks an adequate multiport analysis. Within the Draft Economic Appendix, Section 5, "Multiport Competitiveness Analysts," the Georgia Ports Authority presents extensive data on the current economics and physical characteristics of several, not all, of the major South Atlantic ports that participate in container shipping. This baseline information is a first step, but the Report fails to take the next, and more important steps, of comparing the likely effects on those harbors with the proposed Savannah Port deepening and without it, nor the effects on Savannah and its future of the developments at those harbors. The report does not even examine such effects on the adjacent ports of Charleston and Jacksonville, let alone the other South Atlantic ports including Norfolk, Wilmington, and Miami.

The report establishes what the commodities are expected to be, and where the origin and destinations are likely to be, but it does not consider what effect the proposed plan will have on which harbor will be used, and does not analyze rail and road availability to Savannah port users who must assess whether to shift to other ports. This is essential information in determining the economic feasibility of the proposed project.

The purpose of a feasibility report is to determine whether a proposed project is an efficient use of government funds. The report most directly addresses the question of how to most efficiently meet the needs of the larger container ships in the South Atlantic and cannot

limit the inquiry to the Savannah harbor. Such an inquiry should take into consideration how many total ports along the South Atlantic coast can ef6ciently accommodate the big ships and which of ports are best suited for the task. It is not necessary to deepen every port in the region. The economic and environmental costs are high, and the benefits will be undermined if too many ports expand,

These concerns are particularly relevant to Savannah, where the "harbor" is not a natural harbor at all, but instead is a dredged river. The Savannah River is ultimately limited in the extent of repeated deepenings it can tolerate.

Therefore, the most crucial issue in determining whether the Savannah Port Expansion is feasible is the interplay between all the ports and rail and road facilities of the South Atlantic region. As clearly recognized by the Corps regulations and guidelines, not considering the reciprocal effects of the various projects underway or proposed in the region renders it impossible to determine whether the Savannah project is economically feasible and is the most efficient use of the enormous public funds involved. This Feasibility Report completely lacks the comparative information that is necessary to make such an assessment.

DRAFT ENVIRONMENTAL IMPACT STATEMENT

Under federal law, the Environmental Impact Statement serves two key purposes. The first is to require federal agencies thoroughly and objectively to investigate, evaluate and disclose environmental consequences associated with any major federal action in sufficient detail to assist the agencies in determining whether and how to proceed with a proposed action. The second is to provide the public with a full and accurate disclosure of the likely environmental impacts of a proposed action, thereby encouraging full public involvement in the development of such information. See, e.g., Baltimore Gas and Electric Company v. NRDC, 462 U.S. 87 (1983). In order to fulfill these purposes, an EIS must describe the purpose and need for the proposed action, analyze the direct and secondary environmental and economic impacts of a range of alternative means to fulfilling that purpose, and, if mitigation is proposed, analyze the effectiveness of the proposed mitigation.

As with the Draft Feasibility Report, the Draft EIS is fundamentally flawed. For this reason, we will address several key issues and on other issues will incorporate the comments of others.

Project Purpose And Need

NEPA requires that an EIS contain a statement of purpose and need for the proposed action. NEPA regulations provide that "the statement shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including their proposed action." 40 C.F.R. Section 1502.13; 33 C.F.R. Section 325, App B(9)(b)(4) (emphasis added).

Courts regularly have held that the statement of purpose and need should be defined to reflect the objective, general need for the proposed activity rather than the specific, narrow course of action preferred by the applicant. The rule as articulated by one federal appellate court is representative: "[The evaluation of 'alternatives' mandated by NEPA is to be an evaluation of the alternative means to accomplish the general goal of an action; it is not an evaluation of the alternative means by which a particular applicant can reach his goals." Van Abbema v. Fornell, 807 F 2d 633, 638 (7th Cir. 1996)(emphasis in original). The applicant in that case proposed to construct a facility for the purpose of "transload[ing] coal from trucks to barges on the Mississippi River." Id. at 635. The court rejected the applicant's narrow definition, and instead defined the general goal as one "to deliver coal from mine to utility." Id. at 638.

Town of Mathews v. U.S. Dept. of Transp., 527 F. Supp. 1055 (W.D.N.C. 1981) exemplifies application of this requirement to a highway project. The Department of Transportation sought to reconstruct and widen an existing highway. The town requested that the agency include a bypass as one of the alternatives for study in the EIS. The agency failed to give detailed consideration to the bypass alternative on the grounds that "the sole purpose or goal of the Highway 51 improvement project is the repair of an existing substandard road, [and therefore] only alternative methods of repair of that road are "within the scope" of the project, and need be considered in the EIS." Id, at 1057. The court

rejected the agency's narrow definition, determining that the "proposed project has the dual purposes of repairing an old road and of upgrading it to serve the through traffic ... in the foreseeable future," Id. Thus, the DOT was legally required to consider both a bypass and improvements to the existing highway.

In addition, permits to fill wetlands and to discharge dredge material will be required for this project. Under Section 404 of the Clean Water Act only the least environmentally damaging practicable alternative" can be permitted. 33C.F.R, Para 323.6; 40 C.F.R. Para 230.10(a). In a Section 4O4 wetlands fill permit, the statement of purpose and need required by NEPA should mirror the statement of "basic purpose" required by the 404(b)(1) Guidelines. See generally USCOE, Permit Elevation, Old Cutler Bay Associates, at 7 (Sept, 30, 1990). The NEPA statement of need and purpose (or the "basic purpose") is an especially critical component of the EIS because it guides the agency in defining the range of alternatives to be analyzed. Id. at 6. "It is only when the 'basic project purpose' is reasonably defined that the alternatives analysis required by the [404(b)(1)] Guidelines can be usefully undertaken by the applicant and evaluated by the Corps." Id. The Assistant Secretary of the Army (Civil Works) has cautioned against "so narrowly defining the project purpose that it unreasonably limits the consideration of alternatives and, thereby, subverting a key provision of the (section 404(b)(1)] Guidelines." Id. at 4.

An overly restrictive statement of need will likely result in an incomplete search for alternatives, increasing the likelihood that reasonable, less environmentally damaging alternatives are overlooked, Corps regulations provide that, "the Corps will, in all cases, exercise independent judgment in defining the purpose and need for the project from both the applicant's and the public's perspective." 33 C.F.R. Section 325, App B(9)(b)(4). Corps headquarters has rejected overly restrictive statements of project purpose and need, emphasizing that "[t]he project purpose must be defined so that an applicant is not in the position to direct, or attempt to direct, or appear to direct, the outcome of the Corps evaluation required under the 404(b)(1) Guidelines," Old Cutler Bay, supra, at 7.

The purpose of the proposed dredging is stated in the Draft EIS to be:

> (a) provide better passage for the existing fleet of larger vessels through the harbor at all tides, thus reducing shipping delays- and (b) 9 provide for safe and efficient transit of larger vessels expected to call on Savannah Harbor in the future.

DEIS at 2.2. This statement of the project purpose, however, is exactly the sort of overly restrictive statement which has been declared inappropriate both by Corps regulations and judicial authority. The statement masks the true purpose of the project, which is to enable businesses in the area served by the Savannah Port to economically and competitively ship or receive goods. Deepening of the channel to 50 feet may be one means toward that goat, but it is certainly not the only means which would further that goal. The Port exists to provide competitive shipping services to these businesses. Expansion of the Port is not an end in itself but rather one possible means to competitive provision of shipping services.

Because the DEIS states the project purpose and need too narrowly and specifically, the range of alternatives considered is unduly and unlawfully constricted, contrary to the mandates of the National Environmental Policy Act, the Clean Water Act, and other applicable law. First, the statement of purpose is applied in the DEIS to restrict the range of alternatives to physical modification of the shipping channel. In doing so the DEIS completely ignores the fact that the Savannah Port is an intermodal shipping facility, linking shippers not only by ship but also by road and rail. As was discussed above regarding the Draft Feasibility Study, the DEIS completely fails to analyze combinations of road, rail and channel improvements that could fulfill the true underlying purpose by better linking shippers both to the Savannah Port and to other ports which will be able to serve the largest ships. The DEIS also falls to analyze alternatives which assume that other ports, such as the nearby Charleston facility or the Freeport, Bahamas deepwater port, become the dominant South Atlantic port of call for the largest container ships.

Moreover, the excessively narrow definition of the project purpose leads the DEIS to conclude, without analysis, that greater depth is automatically to be preferred, no matter what the economic rationale or the environmental consequences. The report falls to explain why neither the economically most advantageous**(1)** depth of 47 feet, nor the environmentally more benign depths of any dredging level short of 50 feet, do not fulfill the purposes of the project. The South Carolina Ports Authority, in contrast, has concluded that a 45 foot depth is adequate to meet the needs of the anticipated jumbo ships,

The statement of purpose completely ignores the economic realities of this project and of the 21st Century shipping industry by failing to incorporate economic feasibility and Savannah's competitive standing in relation to larger nearby ports. This omission drives the alternatives analysis, leading inexorably to the conclusion that deeper is better and deepest is best.

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(1) Most advantageous, that is, as under all of the assumptions, variables and calculations used in the Feasibility Report, the validity of which is certainly not conceded.

Alternatives Analysis

It is well-established that the alternatives analysis is "the linchpin of the entire impact statement," NRDC v. Callaway, 524 F.2d 79, 92-93 (2d Cir. 1975), citing Monroe County Conserve Soc., Inc v. Volpe, 472 F.2d 693, 697-698 (2d. Cir. 1972), and that the "development and discussion of a wide range of alternatives to any proposed federal action is so important that it is mandated by NEPA when any proposal involves unresolved conflicts concerning alternative uses of available resources. NEPA regulations require the agency to "rigorously explore and objectively evaluate all reasonable alternatives." 40 C.F.R. Para 1502.14(a). "In determining the scope of alternatives to be considered, the emphasis is on what is 'reasonable' rather than on whether the proponent or applicant likes or is itself capable of carrying out a particular alternative " Memorandum: Forty Most Asked Questions Concerning CEQ's NEPA Regulations, 46 Fed. Reg. 18026 (March 23, 1991), as amended, 51 Fed. Reg. 15618 (April 25, 1986) (hereinafter "40 Questions").

The level of scrutiny required by NEPA in the alternatives analysis is proportional to the scope of the proposed project and the nature of the environmental impacts associated with it. See, Rankin v. Coleman at 654-655; Brooks v. Volpe at 275-276 ("breadth of inquiry must be appropriate to the scope of the project").

The lead agency must consider reasonable alternatives even if they achieve only partially the objectives of a proposed action. See, eg., NRDC v. Morton, 458 F.2d 827 (D.C. Cir. 1972); Town of Mathews, supra at 1057-58; NRDC v. Hodel 865 F.2d 288 (D.C. Cir 1988); North Buckhead Civic Ass'n v Skinner, 903 F.2d 1533 (11th Cir. 1990) ("discussion of alternatives that would only partly meet the goals of the highway project may allow the decision-maker to conclude that meeting part of the goal with less environmental impact may be worth the tradeoff with a preferred alternative that has a greater environmental impact").

As with the EIS statement of purpose and need, this rigorous approach to the alternatives analysis is necessary to obtain a 404 permit from the Corps. See, RGL 93-2. The 404(b)(1) Guidelines, implemented by EPA and the Corps in a Memorandum of Agreement, require a sequencing" approach to determine whether to issue a 404 permit. This requires that the proposed activity (1) avoid loss of wetlands; (2) minimize any unavoidable wetlands loss; and (3) compensate for any remaining impacts to wetlands, As noted above, the Guidelines specifically provide that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences." 40 C.F.R. SS 230.10(a). A determination of whether a practicable alternative is available can only be made following a detailed and probing alternatives analysis.

As with NEPA, under the Clean Water Act the greater the environmental impact associated with a proposed project, the more probing the search for alternatives must be. EPA/Corps guidance underscores this point:

The amount of information needed to make such a determination and the level of scrutiny required by the Guidelines is commensurate with the severity of the environmental impact (as determined by the functions of the aquatic resource and the nature of the proposed activity) and the scope/cost of the project RGL 93-2 at 2.

Here, of course, the project is enormous, involving very substantial dredging over 36 miles of ocean and river channel, completely re-engineering the flow of the water through the river and marsh system, and severely impacting river and coastal water quality, critical fisheries habitat, and over 1,000 acres of tidal freshwater marshes. A project of this magnitude, in an ecosystem which is both exceptionally complex and suffering from the cumulative impacts of a long series of previous dredging projects and attempts to alter the river and marsh water flow, requires the most detailed scrutiny before an alternative is selected.

Here, even basic level of analysis is given only to the environmental consequences of the 50foot alternative, with essentially no analysis of the impacts of smaller amounts of dredging. In this regard, we fully endorse the recommendations and comments of the United States Fish and Wildlife Service, expressed in their recommendations of November, 1997, February, 1998, and reiterated in their comment letter dated June 22, 1998, that the modeling used to evaluate alternatives was entirely insufficient, both in failing to model salinity and dissolved oxygen impacts for the two, four, and six foot dredging alternatives, and in failing to run recommended modeling analyses of mitigation alternatives. Modeling alternative dredging depths is critical to a probing analysis of those alternatives. The complexity of the Savannah harbor hydro-dynamic system does not allow unexamined assumptions that the salinity and dissolved oxygen impacts will be linear through the various dredging alternatives.

Thorough modeling of any mitigation alternatives is critical because the dredging proposal acknowledges the severity of impacts which will occur to water quality, freshwater marshes, and fishery habitat, so heavy reliance is being placed upon the effectiveness of the mitigation measures. Alterations of the ecosystem as dramatic as the closure of Middle River certainly cannot be proposed without complete analysis, particularly where previous, similar attempts to alter the ecosystem have exacerbated wetlands and -fisheries losses and where the attempted mitigation measure would actually likely increase salinity incursion upstream in Front River.

We agree with and endorse the Fish and Wildlife Service's statement that "we believe Middle River closure is a high risk mitigation measure that could cause significant adverse impacts. We are concerned the plan would simply shift the salinity problem further- up Front River, perhaps as far as McCoys Cut, and into Back River and

Middle River. This action could also cause adverse changes in water level, sedimentation rate, current velocity and fish and wildlife movement in Back River and Middle River." (USFWS letter of 6/22/98, at 4). Since much of the remaining, severely

threatened striped bass reproduction occurs in Front River, closing Middle River and concentrating the salinity effects in Front River may well actually exacerbate, rather than mitigate, impacts on striped bass habitat. This proposed mitigation would also increase the risk of water quality impacts on the city of Savannah water intake.

In addition to these global analytical failures of the DEIS, we endorse and incorporate into our comments the more specific comments made by the FWS regarding the impact analysis. These include the limited utility of main channel sampling for characterizing baseline salinity conditions in the inner areas and secondary channels (DEIS, Sec. 4, pp. 7-28), the failure to take account of data which undermine the assumptions made regarding interstitial salinities and tidal impacts on the marshes (Id.), the unsupported conclusion that the existing navigation project has no unacceptable impact on shortnosed sturgeon or its habitat, a conclusion not supported by data, (DEIS, Sec. 4, p. 62), the other detailed comments made by the FWS in its June 22, 1998 letter and its analysis of issues regarding dredge material ("DMEEE") in its June 23, 1998 letter, and the failure to take account of existing water quality violations in the Savannah River and the project's possible conflict with the antidegradation provisions of the Clean Water Act.

Impact of Related Work

Corps regulations require inclusion of "related work" in planning and evaluation of harbor deepening projects, 33 C.F.R. Para 336.1(b)(7). "Related work" includes, but is not limited to, maintenance dredging of approach channels and berthing areas. (Id.) Here, the berths may be dredged, and, perhaps more importantly, the Georgia Ports Authority is building a new Container Berth 7, on 1,200 feet of river frontage and is in the final planning stages of an enormous eighth container berth, using another 1,200 feet of river frontage.

The impacts of these activities should be analyzed fully as related work in this EIS.

Coordination with-Other Agencies and the Public

Of course, NEPA, the WRDA, and the Fish and Wildlife Coordination Act, 16 U.S.C. Para 661, et seq., require very close coordination between the Corps of Engineers, the FWS, the National Marine Fisheries Service, state wildlife and environmental agencies, local government, and the public. In addition, the states of South Carolina and Georgia must determine that the project is consistent with their water quality and coastal zone management program, laws and regulations. Here, the input from the key resource agencies has been solicited, but then largely ignored. Both FWS and NMES have made clear that the health of the freshwater tidal marshes in the Savannah NWR, and the restoration of striped bass and shortnosed sturgeon fisheries, are critical management objectives of the two agencies. NMFS specifically states that past Savannah project “effects on the lower Savannah River striped bass and shortnosed sturgeon populations are among the highest fishery resource management concerns that we presently face in South Carolina and Georgia," (NWS letter dated March 10, 1998, reproduced in Appendix H to DEIS). Fish and Wildlife Service has, as mentioned above, made repeated comments on the inadequacy of the data collection and modeling analysis for characterizing existing conditions and trends, for evaluating impacts, and for analyzing the proposed mitigation. Despite FWS' repeated

requests for additional modeling analysis, the modeling has not been conducted. This refusal to address resource agency concerns fails the close coordination test. The significance of these issues to the FWS and other resource agencies is made clear in the FWS' decision not to recommend forwarding this project to Congress for approval and its consideration of referring this project to CEQ for resolution of the serious environmental issues which remain unresolved.

Similarly, South Carolina Department of Health and Environmental Control has declined to certify this project as consistent with its applicable laws and regulations, citing, inter alia, the hasty elimination of alternatives other than the 50 foot depth, the inadequate modeling analysis the likely failure of the proposed mitigation, problems with spoil disposal, and the severity of the environmental impacts. The Corps' duty to fully address these concerns has not been fulfilled, rendering the DEIS inadequate. See, eg, 33 C.F.R. Para 336.1(b)(8)(ii) ("district engineer will work with the state to acquire data to satisfy compliance with state water quality standards").

Finally, we understand that many of the conditions and commitments made to the public and the resource agencies in connection with previous harbor deepening projects have not been fulfilled. These failures are further cause for concern about the Corps' and the Ports Authority's commitment to carry out their duties.

CONCLUSION

For all of these reasons, neither the Draft Feasibility Report nor the Draft Environmental Impact Statement for the Savannah Harbor project have, fulfilled the applicable legal requirements. The economic analysis falls to examine the reality of the competitive situation which Savannah faces and will face as nearby ports expand and the shipping industry selects fewer and fewer ports to serve with its largest ships. The environmental analysis fails to develop adequate baseline information, reflects the refusal to conduct adequate modeling analysis, and proposes an entirely unexamined but high risk mitigation measure for the obvious and severe environmental impacts which are projected. The Corps should fully address the concerns and comments of the various resource agencies and conduct the additional studies suggested before proceeding to a final EIS.

Very truly yours,

Donnell Van Noppen III
Senior Attorney

S. Wesley Woolf
Senior Attorney

Enclosures

cc: Dana Beach, SCCCL

Jane Lareau, SCCCL
Ben Brewton, CEO
Ed Eudaly, U.S. Fish and Wildlife Service
Sam D Hamilton, U.S, Fish and Wildlife Service
Hudson Slay, US EPA
Robert D. Mikell, SC DHEC, Office of Ocean and Coastal Resource Management

Copied from an article published in the Savannah Morning News

GPA working to deepen harbor

Board approves $850,000 for a feasibility study and puts it on the fast track.

By Brad Swope
Savannah Morning News

The Georgia Potts Authority's board of director's took an early but vital step today toward the next deepening of 'Savannah harbor.

The board approved $850.000 for a deepening feasibility study that will begin immediately and should be done within a year - a third of the usual time for such a study, authority officials say.

“We’re trying to get the Feasibility study on a fast track." said Doug J. Marchand, the authority’s executive director.

The deepening would accommodate a continuing industry trend toward larger ships and seek to keep the port competitive by avoiding delays at low tide.

The accelerated schedule for the study – a necessary first step toward deepening – would allow congressional approval of the deepening project in October 1998 and the start of actual work in March 1999, authority officials hope.

Savannah’s 42-foot harbor now has a two-foot advantage over rival Charleston, SC’s 40 feet.

But Charleston plans to start dredging work next year to create a 45-foot harbor. The Georgia Ports Authority wants to match or beat that depth, and do so first if possible.

“There’s no doubt that there is competition between ports,” said Anne Moise, a spokeswoman for the South Carolina State Ports Authority.

Charleston already has done the feasibility study for its $116 million deepening project, Moise said. “This year they have the money for the final design work.”

Marchand wants to complete the Savannah deepening in 2000 or 2001, while Charleston is looking at 2001 or 2002, Moise said.

Savannah last deepened its harbor in 1994, taming it from 38 to 42 feet deep at a cost of $33 million.

The Army Cops of Engineers, which oversees deepening work, is still calculating costs for the next proposed deepening.

The Ports Authority also approved $381,000 Monday toward a feasibility study on deepening Brunswick's 30-foot harbor: $144,000 for that study previously was approved.

The new depth would be 34 or 36 feet, Marchand aid.

Combined, the feasibility studies for Savannah and Brunswick would cost about $1.37 million, and at least $650,000 of that total is considered eligible for federal reimbursement.

EXHIBIT 1

Coastal Group Sierra Club
P.0. Box 8502
Savannah, GA 31412-8502

June 15, 1998

Brig. Gen. Robert L VanAntwerp
U.S. Army Corps of Engineers
South Atlantic Division
77 Forsyth St. SW
Atlanta, GA 30303

Dear Gen. VanAntwerp:

It has come to our attention that the Savannah District of the Army Corps of- Engineers recently presented the 1998 Trainer Award to the Savannah Harbor Expansion Project Feasibility Study Team, a copy of which is attached. Team members acknowledged by the award included various Corps staff, Georgia Ports Authority staff, and additional study participants including Applied Technology Management, Inc.

Our group finds this award premature considering that the Draft Environmental Impact Statement of the study is under public comment, has yet to receive approval by the Army Corps of Engineers as well as be submitted to and authorized by Congress as mentioned in paragraph (b) of Section 203.

Section 203
(b) REVIEW BY SECRETARY - The Secretary shall review each study submitted under subsection (a) for the purpose of determining whether or not such study and the process under which such study was developed comply with Federal laws and regulations applicable to feasibility studies of navigation for harbors or Inland harbors.

Of even greater concern is that presentation of the award calls into question the objectivity of the Savannah District in its upcoming review of the Draft EIS and submitted comments. This document will not receive an unprejudiced review as it should and must.

As a result, the Coastal Group Sierra Club requests that the review and approval of this document be reassigned to an unbiased and objective district of the Army Corps of Engineers other than the Savannah District.

Thank you for your time and attention to this matter.

Sincerely,

Teri Leffek
Chairman, Coastal Group Sierra Club

cc: Dr. John H. Zirschky, Acting Asst. Secretary of the Army (CW)
Dr. Joseph W. Westphal, Asst Secretary of the Army (CW) Designee
William Bailey, Savannah District USACE
Susan Durden, Savannah District USACE
Governor Zell Miller
Charlie Griffen, Georgia Ports Authority
James McCurry, Georgia Ports Authority

attachments (1)

EXHIBIT 2

----------NEXT AWARD----------

IN OUR CIVIL WOPKS PROGRAM, THE 1998 TRAINOR AWARD FOR CIVIL PROJECT TEAM OF THE YEAR IS AWARDED TO THE SAVANNAH HARBOR EXPANSION PROJECT FEASIBILITY STUDY TEAM.

ACCEPTING ON BEHALF OF THE TEAM IS DAN PARROTT, STUDY MANAGER. THIS VIRTUAL TEAM IS CONPOSED OF SAVANNAH DISTRICT, G'EORGIA PORTS AUTHORITY, LOCKWOOD GREENE ENGRNEERNG, APPLIED TECHNOLOGY AND MANAGEMENT. INC., REES ENGINERING AND ENVIRONMENTAL SERVICES, AND BOOZ-ALLEN.AND HAMILTON.

DAN, PLEASE BRING YOUR TEAM UP TO THE STAGE.

(JIM READS THE NAMES AS THEY ARE COMING UP.)

FROM PROGRAMS AND PPOJECT MANAGEMENT DIVISION -- DAN PARROTT, LISA CIOLEK, VIRGINIA SPITZ, JOHN SAIA. FROM PLANNING DIVISION -- BILL BAILEY, JAMES CALVER, MARTIN COOLEY, LEROY CROSBY, MONICA SIMON-DODD, SUSAN DURDEN, LARRY LYONS, JUDY WOOD, MYRON YUSCHISHIN. FROM OFFICE O'F COUNSEL -WARREN SWARTZ. FROM REAL ESTATE DIVISION -- MARY ASHBY, JOHN HINELY, VERNON LAWLESS, SANDI REINHART. FROM OPERATIONS DIVISION – MICHAE ANSLEY, CONE BOSTWICK, MARK CLARK, DAVID CRAMPTON, NED DURDEN, ALAN GARRETT, DAVID HODGES, WALT LANIER, JR, ROY MORRIS. FROM ENGININEERING DIVISION – GUSTAVE ANDERSON, JAMFS ARTHUR, JAMES BIDDLE, SUSAN BRINNSON, MATTHEW DELANO, JEFFREY DICK, CHARLES FILMER, HORACE FULCHER, JR, BEN FOREMAN, DIANE HAMPTON, JOHN HASKEW, WESLEY HERMAN, DANNY HEWETT, JOSEPH HUDAK. JR, DOUGLAS LA ROCHE, ARMOND MARTIN, III., KENNY PERNELL, ROBERT O'KELLEY, CLAUDE ROBBINS, ELLIOTT ROUGHEN, PERRY ROUNDTREE, WADE SEYLE, JR.. CARDWELL SMITH, PHILLIP SMITH, WILBUR WIGGINS, JAMFS MOODY, WALTER TORRANCE, DEBRA BRAGG. FROM GEORGIA PORTS AUTHORITY -- CHARLES- F. GRIFFEN, MARY HANN, CATHY VAUGHN, JAMIE MCCURRY. FROM LOCKWOOD GREENE ENGINEERING -- TED MC INTYRE, LARRY KEEGAN. FROM APPLIED TECHNOLOGY AND MANAGEMENT INC.—ED MODZELEWSKI, STEVE PEENE, BO ELLIS. FROM REES ENGINEERING AND ENVIRONMENTAL SERVICES -- MORGAN REES. FROM BOOZ-ALLEN AND HAMILTON -- LEO DONOVAN, DAVID AMBLE, AND KEN MATHIAS.

THE CIVIL PROJECT TEAM OF THE YEAR AWARD FOR 1998 IS PRESENTED TO.THE TEAM THAT DID THE IMPOSSIBLE!! BY USING NEW AND INNOVATIVE PROCESSES THE SAVANNAH HARBOR EXPANSION PROJECT FEASISILITY STUDY TEAM COMPLETED A FEASIBILITY STUDY ON A COMPRESSED SCHEDULE GIVING THE PROJECT AN OPPORTUNITY TO BE INCLUDED IN THE WATER RESOURCES

DEVELOPMENT ACT OF 1998. THE STUDY IS ONLY THE SECOND CONDUCTED UNDER SECTION 203, WHICH ALLOWS A LOCAL SPONSOR, IN THIS CASE, GEORGIA PORTS AUTHORITY, TO PREPARE AND SUBMIT A FEASIBILITY STUDY TO CONGRSS FOR APPROVAL. GPA CONTRACTED WITH THE ARMY CORPS OF ENGINEERS, ARCHITECT/ENGINEER FIRMS, AND PROFESSIONAL CONSULTANTS, FORMING AN INTERDISCIPLINARY STUDY TEAM TO EVALUATE THE FEASIBILITY OF DEEPENING THE HARBOR FROM ITS PRESENT DEPTH OF 42 FEET DOWN TO A POTENTIAL 50 FEET. TYPICALLY THE TIME REQUIRED TO COMPLETE A STTIDY OF THIS SIZE AND COMPLEXITY IS AT LEAST THREE YEARS. THIS TEAM DID IT IN JUST 14 MONTHS!!

CONGRATULATIONS TO THE CIVIL PROJECT TEAM OF THE YEAR.

Letter response

Southern Environmental Law Center
137 EAST FRANKLIN STREET
SUITE 404
CHAPEL HILL, NC 27514

Date: July 7, 1998

1. COMMENT: SELC submits these comments on behalf of the South Carolina Coastal Conservation League ("SCCCL") and the Coastal Environmental Organization of Georgia Inc. ("CEO") in response to the publication of the Draft Feasibility Report and EIS regarding deepening of the federal navigation project in Savannah Harbor.

RESPONSE: GPA welcomes the views of all parties concerning this project.

INTRODUCTION

2. COMMENT: As will be discussed below, several past harbor modifications involving channel deepening have resulted in increased salinity and decreased D.O. in the river, causing catastrophic collapse of the striped bass fishery and the habitat available for the endangered shortnosed sturgeon, while also causing the loss of over half of the tidal freshwater marsh which form the centerpiece of the Savannah NWR.

RESPONSE: Past harbor improvement projects have increased salinity levels and decreased D.O. in the upper harbor. The biological effects of those changes, as well as other changes in biota in the harbor, have not been determined conclusively.

3. COMMENT: That the proposed deepening will exacerbate these conditions is hardly disputed; instead, the project proposes to attempt to mitigate those adverse consequences by dramatically "re-engineering" the flow of water through the river and the adjoining marshes. The DEIS, however, completely fails to demonstrate that the proposed re-engineering of the river by closing Middle River from Front River will salvage the remaining freshwater marsh or the threatened fisheries.

RESPONSE: The DEIS discloses the expected impacts of the proposed project and describes both impact avoidance and mitigation features that are included in the proposed project to address those concerns. The proposed closure of Middle River is an engineeringly feasible measure that was included to reduce salinity impacts in the Back and Middle Rivers. State resource agencies have repeatedly stated that high salinity levels in those locations adversely effect freshwater marsh and important estuarine fisheries.

4. COMMENT: The Draft Feasibility Report is similarly flawed in failing to make a genuine multi-port competitive examination of the wisdom of investing enormous public resources into this dredging project.

RESPONSE: A comprehensive multiport competitive analysis was completed in accordance with USACOE National Economic Development Deep Draft Navigation Project guidelines. The multiport analysis considered all major U.S. South Atlantic ports and representative ports from the U.S. North Atlantic, Gulf and Pacific Coast regions. The multiport analysis included comparisons regarding: port infrastructure (e.g., facilities, landside access, carriers, capacity & utilization, etc.), total shipper transportation cost to serve major trade lane and hinterland combinations (e.g., Asia trade to Atlanta, Asia trade to Chicago, Europe trade to Houston, Europe trade to Knoxville, etc.), and planned infrastructure investments and improvements.

Additional information to consider in response to the above public comments are as follows:

- The trade forecast does not assume cargo diversion between major competitor ports in the South Atlantic. This is due to the fact that over the long term, cargo diversions may not be sustainable due to infrastructure investments (throughput capacity, equipment, and technology) by the competing ports in the South Atlantic port region or broader U.S. The multiport analysis completed supports the conclusion that cargo diversion, if possible, may not be sustainable. Importantly, factors such as carrier service (e.g., quality, frequency, etc.) and time of shipment (i.e., 10 days versus 8 days) were identified as important factors which can impact a shipper's decision, over cost, to use select one carrier or routing over another.
- Over the long term, country-to-country (origin / destination) trade demands will remain constant. As such, carriers will continue rationalization of their route structures to best service current and forecast trade patterns. However, rationalization of route structures will be based on a system approach and will leverage economies-of-scale, such as provided by larger containerships, where possible for major trades supported by Savannah and other South Atlantic ports.
- Federal guidelines do not allow the use of economic impacts (jobs, wages, business sales, and taxes) to influence or determine the NED Plan. Consistent with federal study guidelines, transportation cost savings resulting from the reduction in tidal delays and the operation of more effective (e.g., larger) vessels were identified as the primary benefits – and were utilized in conjunction with project costs to identify the federally preferred deepening project.

- Over the study period, ports will maintain sufficient capacity to support future increases in cargo volumes from current levels. This assumption considers that port authorities will make periodic investments in port infrastructure (berths, cranes, storage acreage, etc.), private and public sector investment will insure adequate landside access (e.g.; roads / highways and railways) to support cargo movement to / from the port, and that each port will benefit from technological and productivity improvements in operations.

- U.S. port authorities are constantly reevaluating their competitive position and the benefits of additional investment in infrastructure (e.g., the proposed Charleston deepening project). During the 1990s, rapid change has occurred in the vessels comprising the World, U.S., and Savannah containership fleets. Correspondingly, the Savannah Harbor Expansion Study considers three additional years of container industry change than that considered in the Charleston deepening study. The Savannah Study was completed in accordance with federal guidelines, with the identified federally preferred project reflecting these additional changes within the containership industry and at the Port of Savannah specifically.

5. COMMENT: These fundamental shortcomings may in part be explained by the fact that both studies were prepared under excessively hasty procedures in hopes of obtaining congressional authorization and funding for the project in the currently pending 1998 WRDA bill. It is revealing that the Corps' team that worked on the Draft Feasibility Report won an award for the speed, not the quality, of its work. These procedures also raise fundamental issues about the Corps' ability to objectively evaluate the work prepared by the Ports Authority and its consultants.

RESPONSE: GPA believes that it has conducted the studies that are necessary to evaluate the feasibility of the proposed harbor improvement during the feasibility phase of this project. It recognizes that additional studies are required to completely define the mitigation plan, and those studies are scheduled to be performed after authorization, as is allowed under NEPA.

DRAFT FEASIBILITY REPORT

6. COMMENT: GPA conducted a feasibility study to determine whether deepening the channel at Savannah Harbor to accommodate larger container ships was justifiable in light of the significant environmental impacts and large economic investment. The Feasibility Report, issued upon completion of the study, must comply with all federal laws and regulations pertaining to feasibility studies of harbor navigation projects. The Army Corps of Engineers' Engineering Regulation ("ER") 1105-2-100 and the Water Resource Council's *Economic Principles and Guidelines for Water and Related Land Resources Implementation Studies* summarize and implement the applicable laws governing preparation of the Feasibility Report.

RESPONSE: GPA believes that the study was conducted in accordance with all applicable federal laws and regulations.

Scope of the Study

7. COMMENT: NEPA regulations provide that in the preparation of studies or reports, agencies should evaluate the proposal and its scope "geographically, including actions occurring in the same general location, such as body of water, region, or metropolitan area." This provision is echoed in the *Guidelines*, which require the Corps to "define the planning area based on the problems and opportunities and the geographic areas likely to be affected by alternative plans."

The scope of the Savannah Feasibility Report is entirely inadequate in failing to address the economic inter-relationship between the proposed Savannah project and the existing and future conditions at competing ports. The economic feasibility of the proposed project is almost entirely dependent upon developments not only in Savannah shipping but also in the conditions and facilities at competing ports, Instead, the dynamic nature of shipping industry trends and the projected changes at competing ports, not just Savannah, must be considered. The Feasibility Report discusses only the economic benefits to the immediate area, Savannah and the rest of the state of Georgia, of having deep draft container ships servicing the port, but makes no mention of the sensitivity of this forecast of benefits to changes occurring at adjacent ports or other ports which have a thriving shipping industry.

RESPONSE: This issue has been adequately addressed in the Feasibility Report to determine the economic justification of the project.

8. COMMENT: The *Guidelines* direct the Corps to look at the general geographic area in which the project will occur. The geographic area for this study should include the entire South Atlantic coast because that is the geographic area that encompasses Savannah's competitor ports. The geographical nexus is especially obvious in the case of Charleston and Jacksonville, which are within a 200-mile radius of both Savannah and each other. While the Report provides an analysis of the current operation of those ports and of their pertinent characteristics, the document fails to assess the effects of the Savannah project on those ports at all, nor, even more importantly, the effects of current and proposed expansion projects at these ports on the economic feasibility of the Savannah project. Knowledge of the baseline characteristics of each of these ports is useful, but the purpose of the Feasibility Report is to examine the feasibility of the proposed activity in light of the future realities. Fulfilling this purpose requires careful projections regarding surrounding ports, not just their baseline condition. If the Savannah Harbor is deepened to accommodate bigger containerships, will shipping companies alter their use at the other ports? Could the other ports accommodate enough of the big containerships to service the region without the expansion at Savannah? How will expansion plans at Freeport, Charleston, Hampton Roads, Wilmington, Jacksonville, and other Atlantic ports affect use of the Savannah port? There are many scenarios which would all have varied environmental and economic impacts on the ports of the region, yet no projections were made as to what these effects might be, and no comparison of these effects for each alternative in the Savannah project was made in the Feasibility Report.

RESPONSE: This issue has been adequately addressed in the Feasibility Report to determine the economic justification of the project.

9. COMMENT: The Corps' engineering regulations state that a study must consider "*diversion from or to adjacent competitive harbors*" and that "there should be adequate discussion of the trade area relative to adjacent ports and any commonality that might exist." The Draft Feasibility Report wholly fails to meet this requirement. The Report shows no consideration of the economic impacts, problems, or opportunities that might occur in the adjacent competitive ports as a result of the proposed activity, and conversely, does not discuss the effect on this project's feasibility of projects at competing ports. Again, the only discussion of other ports was in comparing the baseline economies and characteristics of Savannah in relation to those ports. Such a comparison is of little use since it blatantly fails to address the key inquiry, which is the feasibility of Savannah Harbor expansion in light of developments at competitive ports.

RESPONSE: See response to Comment (4).

Volumes of Commodity Flow

10. COMMENT: "If benefits from economics of ship size are related to proposed deepening of the harbor, the analysis should concentrate on the specific commodities or types of shipments that will be affected." The regulation specifically provides that "particular attention should be given to alternative competitive harbors," and "in determining the likelihood of prospective commerce, particular attention should be given to alternative competitive harbors … [and) the adequacy of existing harbor and transportation facilities."

RESPONSE: See response to Comment (4).

11. COMMENT: The Draft Feasibility Report fails to provide "particular attention" to alternative harbors and the adequacy of the existing harbor. Section 3 of the Draft Economic Appendix forecasts the amount of trade in commodities shipped by container for Savannah and for the South Atlantic Region generally. Once again, the Report fails to apply those forecasts to the different alternatives. The share of the projected trade of container commodities at Savannah may be different depending on whether the harbor channel is actually deepened, and to what depth. Similarly, the percentages of the commodity flow would be altered at competing South Atlantic ports in each of the possible Savannah alternatives. No comparison of "with project conditions" versus "without project conditions" is present in the Report. Without such an analysis, projected commodity flows mean very little for purposes of assessing the feasibility of GPA's proposal.

RESPONSE: See response to Comment (4).

Multiport Analysis

12. COMMENT: As part of its NED study, an agency must incorporate a multiport analysis. "This procedure calls for a systematic determination of alternative routing possibilities, regional port analyses, and intermodal networks that may require the use of computer modeling techniques." Other regulations express the importance of the multiport analysis as well. The ERs require the feasibility studies to "consider competitive harbors with existing terminal facilities and sufficient capacities as possible alternatives for traffic origination ..." In another section, subtitled "same commodity, and origin-destination, different harbor," the ERs and the Guidelines describe what types of scenarios should be assessed by a feasibility study. "This situation occurs where commodities that are now moving or are expected to move via alternative harbors without the proposed improvement would, with the proposed plan be diverted through the subject harbor. Cost reduction benefits from a proposed plan apply to both new and existing harbors and channels."

Reflecting the fundamental problem of the scope of the study, the Feasibility Report lacks an adequate multiport analysis. Within the Draft Economic Appendix, GPA presents extensive data on the current economics and physical characteristics of several, not all, of the major South Atlantic ports that participate in container shipping. This baseline information is a first step, but the Report fails to take the next, and more important steps, of comparing the likely effects on those harbors with the proposed Savannah Port deepening and without it, nor the effects on Savannah and its future of the developments at those harbors. The report does not even examine such effects on the adjacent ports of Charleston and Jacksonville, let alone the other South Atlantic ports including Norfolk, Wilmington, and Miami.

RESPONSE: See response to Comment (4).

13. COMMENT: The report establishes what the commodities are expected to be, and where the origin and destinations are likely to be, but it does not consider what effect the proposed plan will have on which harbor will be used, and does not analyze rail and road availability to Savannah port users who must assess whether to shift to other ports. This is essential information in determining the economic feasibility of the proposed project.

RESPONSE: See response to Comment (4).

14. COMMENT: The purpose of a feasibility report is to determine whether a proposed project is an efficient use of government funds. The report most directly addresses the question of how to most efficiently meet the needs of the larger container ships in the South Atlantic and cannot limit the inquiry to the Savannah harbor. Such an inquiry should take into consideration how many total ports along the South Atlantic coast can ef6ciently accommodate the big ships and which of ports are best suited for the task. It is not necessary to deepen every port in the region. The economic and environmental costs are high, and the benefits will be undermined if too many ports expand. These concerns are particularly relevant to Savannah, where the "harbor" is not a natural harbor at all, but instead is a dredged river. The Savannah River is ultimately limited in the extent of repeated deepenings it can tolerate.

RESPONSE: See response to Comment (4).

15. COMMENT: The most crucial issue in determining whether the Savannah Port Expansion is feasible is the interplay between all the ports and rail and road facilities of the South Atlantic region. As clearly recognized by the Corps regulations and guidelines, not considering the reciprocal effects of the various projects underway or proposed in the region renders it impossible to determine whether the Savannah project is economically feasible and is the most efficient use of the enormous public funds involved. This Feasibility Report completely lacks the comparative information that is necessary to make such an assessment.

RESPONSE: See response to Comment (4).

DRAFT ENVIRONMENTAL IMPACT STATEMENT

16. COMMENT: Under federal law, the EIS serves two key purposes. The first is to require federal agencies thoroughly and objectively to investigate, evaluate and disclose environmental consequences associated with any major federal action in sufficient detail to assist the agencies in determining whether and how to proceed with a proposed action. The second is to provide the public with a full and accurate disclosure of the likely environmental impacts of a proposed action, thereby encouraging full public involvement in the development of such information. In order to fulfill these purposes, an EIS must describe the purpose and need for the proposed action, analyze the direct and secondary environmental and economic impacts of a range of alternative means to fulfilling that purpose, and, if mitigation is proposed, analyze the effectiveness of the proposed mitigation.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

17. COMMENT: As with the Draft Feasibility Report, the Draft EIS is fundamentally flawed. For this reason, we will address several key issues and on other issues will incorporate the comments of others.

RESPONSE: GPA believes the EIS fulfills the applicable legal and regulatory requirements.

Project Purpose And Need

18. COMMENT: NEPA requires that an EIS contain a statement of purpose and need for the proposed action. NEPA regulations provide that "the statement shall briefly specify the

underlying purpose and need to which the agency is responding in proposing the alternatives including their proposed action."

RESPONSE: Concur.

19. COMMENT: Courts regularly have held that the statement of purpose and need should be defined to reflect the objective, general need for the proposed activity rather than the specific, narrow course of action preferred by the applicant. The rule as articulated by one federal appellate court is representative: "[The evaluation of 'alternatives' mandated by NEPA is to be an evaluation of the alternative means to accomplish the general goal of an action; it is not an evaluation of the alternative means by which a particular applicant can reach his goals." The applicant in that case proposed to construct a facility for the purpose of "transload[ing] coal from trucks to barges on the Mississippi River." The court rejected the applicant's narrow definition, and instead defined the general goal as one "to deliver coal from mine to utility."

RESPONSE: The EIS provides an adequate statement of purpose and need.

20. COMMENT: Permits to fill wetlands and to discharge dredge material will be required for this project. Under Section 404 of the Clean Water Act, only the least environmentally damaging practicable alternative" can be permitted. In a Section 404 wetlands fill permit, the statement of purpose and need required by NEPA should mirror the statement of "basic purpose" required by the 404(b)(1) Guidelines. The NEPA statement of need and purpose (or the "basic purpose") is an especially critical component of the EIS because it guides the agency in defining the range of alternatives to be analyzed. "It is only when the 'basic project purpose' is reasonably defined that the alternatives analysis required by the [404(b)(1)] Guidelines can be usefully undertaken by the applicant and evaluated by the Corps." The Assistant Secretary of the Army (Civil Works) has cautioned against "so narrowly defining the project purpose that it unreasonably limits the consideration of alternatives and, thereby, subverting a key provision of the (section 404(b)(1)] Guidelines."

RESPONSE: The EIS provides an adequate statement of purpose and need. It also contains a 404(b)(1) evaluation of the project.

21. COMMENT: An overly restrictive statement of need will likely result in an incomplete search for alternatives, increasing the likelihood that reasonable, less environmentally damaging alternatives are overlooked, Corps regulations provide that, "the Corps will, in all cases, exercise independent judgment in defining the purpose and need for the project from both the applicant's and the public's perspective." Corps headquarters has rejected overly restrictive statements of project purpose and need, emphasizing that "[t]he project purpose must be defined so that an applicant is not in the position to direct, or attempt to direct, or appear to direct, the outcome of the Corps evaluation required under the 404(b)(1) Guidelines,"

RESPONSE: The EIS provides an adequate statement of purpose and need.

22. COMMENT: The purpose of the proposed dredging is stated in the Draft EIS to be:

> (a) provide better passage for the existing fleet of larger vessels through the harbor at all tides, thus reducing shipping delays- and (b) 9 provide for safe and efficient transit of larger vessels expected to call on Savannah Harbor in the future.

This statement of the project purpose, however, is exactly the sort of overly restrictive statement which has been declared inappropriate both by Corps regulations and judicial authority. The statement masks the true purpose of the project, which is to enable businesses in the area served by the Savannah Port to economically and competitively ship or receive goods. Deepening of the channel to 50 feet may be one means toward that goat, but it is certainly not the only means which would further that goal. The Port exists to provide competitive shipping services to these businesses. Expansion of the Port is not an end in itself but rather one possible means to competitive provision of shipping services.

RESPONSE: The EIS provides an adequate statement of purpose and need.

23. COMMENT: Because the DEIS states the project purpose and need too narrowly and specifically, the range of alternatives considered is unduly and unlawfully constricted, contrary to the mandates of NEPA, the CWA, and other applicable law. First, the statement of purpose is applied in the DEIS to restrict the range of alternatives to physical modification of the shipping channel. In doing so the DEIS completely ignores the fact that the Savannah Port is an intermodal shipping facility, linking shippers not only by ship but also by road and rail. As was discussed above regarding the Draft Feasibility Study, the DEIS completely fails to analyze combinations of road, rail and channel improvements that could fulfill the true underlying purpose by better linking shippers both to the Savannah Port and to other ports which will be able to serve the largest ships. The DEIS also falls to analyze alternatives which assume that other ports, such as the nearby Charleston facility or the Freeport, Bahamas deepwater port, become the dominant South Atlantic port of call for the largest container ships.

RESPONSE: The EIS provides an adequate statement of purpose and need.

24. COMMENT: The excessively narrow definition of the project purpose leads the DEIS to conclude, without analysis, that greater depth is automatically to be preferred, no matter what the economic rationale or the environmental consequences. The report falls to explain why neither the economically most advantageous depth of 47 feet, nor the environmentally more benign depths of any dredging level short of 50 feet, do not fulfill the purposes of the project. The South Carolina Ports Authority, in contrast, has concluded that a 45 foot depth is adequate to meet the needs of the anticipated jumbo ships.

RESPONSE: See response to Comment (4).

25. COMMENT: The statement of purpose completely ignores the economic realities of this project and of the 21st Century shipping industry by failing to incorporate economic feasibility and Savannah's competitive standing in relation to larger nearby ports. This omission drives the alternatives analysis, leading inexorably to the conclusion that deeper is better and deepest is best.

RESPONSE: See response to Comment (4).

Alternatives Analysis

26. COMMENT: It is well-established that the alternatives analysis is "the linchpin of the entire impact statement," and that the "development and discussion of a wide range of alternatives to any proposed federal action is so important that it is mandated by NEPA when any proposal involves unresolved conflicts concerning alternative uses of available resources. NEPA regulations require the agency to "rigorously explore and objectively evaluate all reasonable alternatives." "In determining the scope of alternatives to be considered, the emphasis is on what is 'reasonable' rather than on whether the proponent or applicant likes or is itself capable of carrying out a particular alternative." The level of scrutiny required by NEPA in the alternatives analysis is proportional to the scope of the proposed project and the nature of the environmental impacts associated with it. The lead agency must consider reasonable alternatives even if they achieve only partially the objectives of a proposed action. A discussion of alternatives that would only partly meet the goals of the highway project may allow the decision-maker to conclude that meeting part of the goal with less environmental impact may be worth the tradeoff with a preferred alternative that has a greater environmental impact.

RESPONSE: For Feasibility Study purposes, the study conducted a "worse case" scenario of the maximum deepening project of -50 feet. The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

27. COMMENT: As with the EIS statement of purpose and need, this rigorous approach to the alternatives analysis is necessary to obtain a 404 permit from the Corps. The 404(b)(1) Guidelines, implemented by EPA and the Corps in a Memorandum of Agreement, require a sequencing" approach to determine whether to issue a 404 permit. This requires that the proposed activity (1) avoid loss of wetlands; (2) minimize any unavoidable wetlands loss; and (3) compensate for any remaining impacts to wetlands, As noted above, the Guidelines specifically provide that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse

environmental consequences." A determination of whether a practicable alternative is available can only be made following a detailed and probing alternatives analysis.

RESPONSE: A 404 permit will not be required.

28. COMMENT: As with NEPA, under the Clean Water Act the greater the environmental impact associated with a proposed project, the more probing the search for alternatives must be. EPA/Corps guidance underscores this point. The amount of information needed to make such a determination and the level of scrutiny required by the Guidelines is commensurate with the severity of the environmental impact (as determined by the functions of the aquatic resource and the nature of the proposed activity) and the scope/cost of the project. Here, of course, the project is enormous, involving very substantial dredging over 36 miles of ocean and river channel, completely re-engineering the flow of the water through the river and marsh system, and severely impacting river and coastal water quality, critical fisheries habitat, and over 1,000 acres of tidal freshwater marshes. A project of this magnitude, in an ecosystem which is both exceptionally complex and suffering from the cumulative impacts of a long series of previous dredging projects and attempts to alter the river and marsh water flow, requires the most detailed scrutiny before an alternative is selected.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

29. COMMENT: Here, even basic level of analysis is given only to the environmental consequences of the 50foot alternative, with essentially no analysis of the impacts of smaller amounts of dredging. In this regard, we fully endorse the recommendations and comments of the United States Fish and Wildlife Service, expressed in their recommendations of November, 1997, February, 1998, and reiterated in their comment letter dated June 22, 1998, that the modeling used to evaluate alternatives was entirely insufficient, both in failing to model salinity and dissolved oxygen impacts for the two, four, and six foot dredging alternatives, and in failing to run recommended modeling analyses of mitigation alternatives. Modeling alternative dredging depths is critical to a probing analysis of those alternatives. The complexity of the Savannah harbor hydro-dynamic system does not allow unexamined assumptions that the salinity and dissolved oxygen impacts will be linear through the various dredging alternatives.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

30. COMMENT: Thorough modeling of any mitigation alternatives is critical because the dredging proposal acknowledges the severity of impacts which will occur to water quality, freshwater marshes, and fishery habitat, so heavy reliance is being placed upon the effectiveness of the mitigation measures. Alterations of the ecosystem as dramatic as the closure of Middle River certainly cannot be proposed without complete analysis, particularly where previous, similar attempts to alter the ecosystem have exacerbated wetlands and - fisheries losses and where the attempted mitigation measure would actually likely increase salinity incursion upstream in Front River.

RESPONSE: The EIS will be revised to include additional modeling results which present the predicted salinity changes for the Middle River closure avoidance feature under various flow conditions. The result of the Middle River closure modeling indicates that salinity impacts would be avoided in the Middle and Back Rivers with some increase of salinity levels in the Front River. The EIS will be revised to include additional studies which will address the concerns noted and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

31. COMMENT: We agree with and endorse the USFWS's statement that "we believe Middle River closure is a high risk mitigation measure that could cause significant adverse impacts. We are concerned the plan would simply shift the salinity problem further- up Front River, perhaps as far as McCoys Cut, and into Back River and Middle River. This action could also cause adverse changes in water level, sedimentation rate, current velocity and fish and wildlife movement in Back River and Middle River." Since much of the remaining, severely threatened striped bass reproduction occurs in Front River, closing Middle River and concentrating the salinity effects in Front River may well actually exacerbate, rather than mitigate, impacts on striped bass habitat. This proposed mitigation would also increase the risk of water quality impacts on the city of Savannah water intake.

RESPONSE: See Response to Comment #10 in USFWS letter dated June 22, 1998.

32. COMMENT: In addition to these global analytical failures of the DEIS, we endorse and incorporate into our comments the more specific comments made by the USFWS regarding the impact analysis. These include the limited utility of main channel sampling for characterizing baseline salinity conditions in the inner areas and secondary channels, the failure to take account of data which undermine the assumptions made regarding interstitial salinities and tidal impacts on the marshes, the unsupported conclusion that the existing navigation project has no unacceptable impact on shortnosed sturgeon or its habitat, a conclusion not supported by data, the other detailed comments made by the USFWS in its June 22, 1998 letter and its analysis of issues regarding dredge material in its June 23, 1998 letter, and the failure to take account of existing water quality violations in the Savannah River and the project's possible conflict with the antidegradation provisions of the Clean Water Act.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

Impact of Related Work

33. COMMENT: Corps regulations require inclusion of "related work" in planning and evaluation of harbor deepening projects. "Related work" includes, but is not limited to, maintenance dredging of approach channels and berthing areas. Here, the berths may be dredged, and, perhaps more importantly, the Georgia Ports Authority is building a new Container Berth 7, on 1,200 feet of river frontage and is in the final planning stages of an enormous eighth container berth, using another 1,200 feet of river frontage. The impacts of these activities should be analyzed fully as related work in this EIS.

RESPONSE: The EIS adequately addresses the project impact on maintenance dredging activities and the need to dredge Container Berth 7 to the new project depth.

Coordination with-Other Agencies and the Public

34. COMMENT: Of course, NEPA, the WRDA, and the Fish and Wildlife Coordination Act, require very close coordination between the Corps, the USFWS, the NMFS, state wildlife and environmental agencies, local government, and the public. In addition, the states of South Carolina and Georgia must determine that the project is consistent with their water quality and coastal zone management program, laws and regulations. Here, the input from the key resource agencies has been solicited, but then largely ignored. Both USFWS and NMMS have made clear that the health of the freshwater tidal marshes in the Savannah NWR, and the restoration of striped bass and shortnosed sturgeon fisheries, are critical management objectives of the two agencies. NMFS specifically states that past Savannah project “effects on the lower Savannah River striped bass and shortnosed sturgeon populations are among the highest fishery resource management concerns that we presently face in South Carolina and Georgia". The USFWS has, as mentioned above, made repeated comments on the inadequacy of the data collection and modeling analysis for characterizing existing conditions and trends, for evaluating impacts, and for analyzing the proposed mitigation. Despite USFWS' repeated requests for additional modeling analysis, the modeling has not been conducted. This refusal to address resource agency concerns fails the close coordination test. The significance of these issues to the USFWS and other resource agencies is made clear in the USFWS' decision not to recommend forwarding this project to Congress for approval and its consideration of referring this project to CEQ for resolution of the serious environmental issues which remain unresolved.

RESPONSE: The EIS adequately addresses the extensive coordination which has taken place with the natural resource agencies. Input from these agencies has been used throughout the project to evaluate environmental impacts.

35. COMMENT: Similarly, South Carolina DHEC has declined to certify this project as consistent with its applicable laws and regulations, citing, inter alia, the hasty elimination of alternatives other than the 50 foot depth, the inadequate modeling analysis the likely failure of the proposed mitigation, problems with spoil disposal, and the severity of the environmental impacts. The Corps' duty to fully address these concerns has not been fulfilled, rendering the DEIS inadequate. The district engineer is to work with the state to acquire data to satisfy compliance with state water quality standards.

RESPONSE: SC DHEC will need to certify the consistency of the project with its CZM regulations prior to construction.

36. COMMENT: Finally, we understand that many of the conditions and commitments made to the public and the resource agencies in connection with previous harbor deepening projects have not been fulfilled. These failures are further cause for concern about the Corps' and the Ports Authority's commitment to carry out their duties.

RESPONSE: The mitigation features for this project will be performed prior to and concurrent with construction.

CONCLUSION

37. COMMENT: For all of these reasons, neither the Draft Feasibility Report nor the DEIS for the project have, fulfilled the applicable legal requirements. The economic analysis falls to examine the reality of the competitive situation which Savannah faces and will face as nearby ports expand and the shipping industry selects fewer and fewer ports to serve with its largest ships. The environmental analysis fails to develop adequate baseline information, reflects the refusal to conduct adequate modeling analysis, and proposes an entirely unexamined but high risk mitigation measure for the obvious and severe environmental impacts which are projected. The Corps should fully address the concerns and comments of the various resource agencies and conduct the additional studies suggested before proceeding to a final EIS.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

38. COMMENT: SELC provided, as Exhibit 1, a copy of an article published in the Savannah Morning News, titled “GPA working to deepen harbor”, that was written by Brad Swope.

RESPONSE: GPA agrees with the content of the article.

39. COMMENT: The SELC provided, as Exhibit 2, a copy of a letter written by the Coastal Group Sierra Club on June 15, 1998 to Brig. Gen. Robert L VanAntwerp, the Division Engineer for the Corps' South Atlantic Division. The letter stated that the Savannah District had recently presented the 1998 Trainer Award to the Savannah Harbor Expansion Project Feasibility Study Team. (A copy of the text of the presentation was attached.) Team members acknowledged by the award included various Corps staff, Georgia Ports Authority staff, and additional study participants including Applied Technology Management, Inc. The group found the award premature considering that the DEIS was under public comment and had yet to receive approval by the Corps, or be submitted to and authorized by Congress as mentioned in paragraph (b) of Section 203. Of even greater concern to the group was that presentation of the award called into question the objectivity of Savannah District in its upcoming review of the Draft EIS and submitted public comments. They believed the document would not receive an unprejudiced review as it should and must. The group requested that the review and approval of this document be reassigned to an unbiased and objective district of the Army Corps of Engineers other than the Savannah District.

RESPONSE: Savannah District did not have review and approval authority over the study reports prepared by GPA. GPA is the organization that has developed responses to the comments received from the public review of the DEIS. GPA intends to submit the final study reports to the ASA(CW) for review and eventual submittal to Congress, following the process established by Congress in 1986. GPA fully expects the ASA(CW)'s review of the documents to be unbiased and objective.

Southern LNG Inc.
Post Office Box 1367
Savannah, GA :314102

SOUTHERN LNG

Mr. William Bailey
US Army Corps of Engineers
Planning Division, Environmental Resources Branch
P.O. Box 889
1OO West Oglethorpe Avenue
Savannah, GA 31402

Subject: Savannah Harbor Expansion Proposal - Potential for Impacts on Pipeline Crossing and Bank Erosion

June 16, 1998

Dear Mr. Bailey:

Regarding the Harbor Deepening Proposal, Southern Natural Gas, Inc. wishes to advise you of its concerns and questions regarding the following:

1. The Executive Summary of the feasibility study reports that the National Economic Plan (NED) plan is to deepen the river channel to (-) 47 feet mlw, and that the Locally Preferred Plan, and the Tentatively Recommended Plan, propose a depth of (-) 50 feet mlw. We therefore understand that during project execution, with pre-dredge maintenance and over-dredge allowances of 2 feet and 4 feet respectively, the Tentatively Recommended Plan could result in the dredge reaching a depth of (-) 56 feet.

Can the bottom of the channel be kept to 500 feet wide between Stations 52+800 to 49+750, which is the 1ocation of the Southern Natural Gas pipeline river crossing? According to Figure 63 of the Engineering Appendix, in the region where the bottom of the proposed channel profile is closest to the two banks, the pipeline slope is about 10 vertical feet per 150 feet in the transverse direction. Maintaining the width of the channel bottom to 500 feet would result in the retention of an extra two feet of coverage over the pipeline. Also, it would provide approximately the same coverage on both sides of the channel as afforded by the existing channel alignment on the South Carolina side.

2. Can Southern Natural Gas, Inc., be advised as to the silt depth required for operation of ship anchors in the event of anchors being deployed over the pipeline? It is for this abnormal situation that extra depth of coverage is requested.

3. Can Southern Natural Gas, Inc., be advised of the increase in wake height expected from the larger container ships? High wakes will directly result in greater river bank erosion and an increase in bank maintenance costs.

4. Will the project require acquisition of real estate for bend widening at the northern end of Elba Island?

Yours sincerely,

Jeff Sheffield
Transmission Superintendent

A SONAT COMPANY

Letter response

Southern LNG Inc.
Post Office Box 1367
Savannah, GA :314102

SOUTHERN LNG

June 16, 1998

1. COMMENT: The Executive Summary of the feasibility study reports that the National Economic Plan (NED) plan is to deepen the river channel to (-) 47 feet mlw, and that the Locally Preferred Plan, and the Tentatively Recommended Plan, propose a depth of (-) 50 feet mlw. We therefore understand that during project execution, with pre-dredge maintenance and over-dredge allowances of 2 feet and 4 feet respectively, the Tentatively Recommended Plan could result in the dredge reaching a depth of (-) 56 feet.

RESPONSE: The LPP and Selected Plan are the 48-foot depth alternative in the final study documents. With that design, dredging will occur to deeper depths to accommodate allowable overdepth and in some locations advance maintenance.

2. COMMENT: Can the bottom of the channel be kept to 500 feet wide between Stations 52+800 to 49+750, which is the 1ocation of the Southern Natural Gas pipeline river crossing? According to Figure 63 of the Engineering Appendix, in the region where the bottom of the proposed channel profile is closest to the two banks, the pipeline slope is about 10 vertical feet per 150 feet in the transverse direction. Maintaining the width of the channel bottom to 500 feet would result in the retention of an extra two feet of coverage over the pipeline. Also, it would provide approximately the same coverage on both sides of the channel as afforded by the existing channel alignment on the South Carolina side.

RESPONSE: Based on evaluations performed to date, the channel requires widening for the design vessel to safely navigate through the Bight Channel. Moving the north toe of the channel to avoid impacts to the pipeline results in a tighter turn. To compensate for this and provide for a more maneuverable turn, the channel was widened to the south side. Based on a revised economic analysis, the selected plan will be for the 48-foot project. This, in effect, will provide the additional two feet of coverage requested in the subject letter. Final channel alignment will be verified during the ship simulator study which is scheduled to be performed in the next project design phase.

3. COMMENT: Can Southern Natural Gas, Inc., be advised as to the silt depth required for operation of ship anchors in the event of anchors being deployed over the pipeline? It is for this abnormal situation that extra depth of coverage is requested.

RESPONSE: We do not have information available concerning the penetration depth of anchors in Savannah Harbor.

4. COMMENT: Can Southern Natural Gas, Inc., be advised of the increase in wake height expected from the larger container ships? High wakes will directly result in greater riverbank erosion and an increase in bank maintenance costs.

RESPONSE: Studies have not been performed to determine increases in wave height from larger ships using Savannah Harbor.

5. COMMENT: Will the project require acquisition of real estate for bend widening at the northern end of Elba Island?

RESPONSE: Acquisition of real estate is not required at the north end of Elba Island for the channel alignment shift proposed in the feasibility study.

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July 7, 1998

Mr. William Bailey
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Savannah District
Environmental Resources Branch
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Savannah, Georgia 31402

Re: April, 1998 Draft Environmental Impact Statement and Draft Feasibility Study for the Proposed Expansion of the Savannah Harbor

Dear Mr. Bailey:

These comments are being provided by Stone Container Corporation ("Stone"). We appreciate the opportunity to review the April, 1998 Draft Environmental Impact Statement (the "DEIS"), Draft Feasibility Study, and other materials related to the United States Army Corps of Engineers' (the "Corps") proposed expansion of the Savannah Harbor (the "Project"). At the outset Stone supports economic expansion of the Savannah River but wishes to stress that it is not our intention to compromise this harbor deepening project. Rather Stone has identified a number of concerns that we believe can and must be addressed to ensure that the integrity of the Harbor is protected and that the other users of this resource are not left with the responsibility of mitigating any impacts that the Project may have on the Savannah River.

1. Project Summary

The Corps proposes to expand the existing navigation facilities at Savannah Harbor, located in Chatham County, Georgia and Jasper County, South Carolina, by deepening the channel to the ocean from 2 to 8 feet. The Corps has indicated that its preferred alternative involves a deepening of 8 feet, for a total channel depth of 50 feet. The Corps has also indicated that any deepening of the channel would have significant impacts on, among other things, the levels of both salinity and dissolved oxygen ("DO") present in affected areas of the Savannah River.

2. Comments Summary

The Project is projected to lower concentrations of dissolved oxygen (DO) in affected areas of the Savannah River to concentrations below those permissible under Georgia law. In addition, the Project's reduction of DO concentrations violates anti-degradation principles central to Georgia's, South Carolina's, and federal regulatory schemes designed to protect water quality. The Project is also predicted to increase salinity levels in the River in a manner which will substantially and negatively impact the undersigned. Further, the Corps' utilization of River modeling with respect to Project impacts on DO and salinity levels contain numerous deficiencies. Stone believes that without mitigation features to alleviate the negative impacts the Corps' discussions of the Project and Project impacts do not comply with the requirements of the National Environmental Policy Act ("NEPA"), 42 U.S.C. §§ 4321 et seq. (1998), and its implementing regulations, located at 40 C.F.R. §§ 1500 et seq. (1997) and 33 C.F.R. Part 336 (1997). Stone believes that the Project should proceed only if cost estimates for such mitigation measures are properly included in the Final Feasibility Study and a commitment to develop a Supplemental EIS is included in a final EIS that responds to Stone' many concerns.

3. State and Federal Laws Implicated by the DEIS

Expanding the Savannah Harbor as proposed in the DEIS does not comply various state and federal statutes, as well as the Corps' own regulations governing such projects. A discussion of the nature of these violations is briefly set forth below.

A. The Project Predicts Violations of State DO Criteria

Pursuant to the Georgia Water Quality Control Act, Georgia has promulgated regulations intended to enhance water quality and prevent pollution. See Ga. Comp. R. & Regs. r. 391-3-6.03(2)(a). Pursuant to these regulations, Georgia currently classifies the portion of the Savannah River running from the Seaboard Coastline Railroad Bridge (River Mile 27.4) to Fort Pulaski (River Mile 0) as a "Coastal Fishing" area. Id. r. 391-3-6-.03(13). Pursuant to those regulations, DO in the above-referenced portion of the Savannah River may be "no less than 3.0 mg/L in June, July, August, September, and October; not less than 3.5 mg/L in May and November; and no less than 4.0 mg/L in December, January, February, March and April." Id. r. 391-3-6-.03(13) n.1. The regulations note that the DO criteria for that portion of the Savannah River are instantaneous minimums. Id.

DO resources in a complex and dynamic system like the lower Savannah River are difficult to analyze. Broadly speaking, however, DO concentrations may be characterized as caught in a balance between supply and demand. On the demand side, DO is constantly removed from the water column by the natural oxidation of organic matter and plant respiration.1 On the supply side, DO is replenished by re-aeration, in which oxygen resources from the atmosphere becomes naturally integrated into the water column. When the rate of DO consumption exceeds the rate of reaeration, DO levels on the water column decrease until either (1)the rates of consumption and reaeration become equal (at the

minimum or “sag” point), or (2)DO concentrations are fully depleted and the water becomes septic. Where, on the other hand, the rate of reaeration exceeds the rate of consumption, DO concentrations will increase until the water column is fully saturated. The concentration of DO in a water column is determined of the types of flora and fauna that may exist in that column.

The hydrodynamic model which has been used predicts that the Project will reduce concentrations of DO present in affected areas of the Savannah River in an amount up to 1 mg/L. DEIS, §§ 5, at 48.[2] According to the DEIS, the proposed dredging to a depth of 50 feet in the Front River "and, consequently higher stratification, [will] cause local reduction in the overall water column reaeration due to a reduced vertical mixing and increased distance from the bottom layers to the surface." DEIS, § 5, at 28-29. The DEIS also notes that in the 50th percentile DO impacts increase between River Miles 12 and 20.5 to a maximum impact of 0.9 mg/L at the highest estimated flow rate; ninetieth percentile impacts indicate a reduction in DO concentrations of up to 1 mg/L near River Mile 17. Id. at 29.

The predicted reduction in DO concentrations may cause the affected areas of the Savannah River to drop below the minimum DO concentrations established by the State of Georgia.[3] Because the Project may reduce DO concentrations in violation of Georgia's water quality standards, the Corps should reevaluate its proposed dredging plans in order to ensure compliance with such standards.[4]

B. The Project Violates State and Federal Anti-Degradation Principles

The Project, by reducing DO concentrations below those permitted under Georgia law, violates that State's anti-degradation mandate. In addition, because the Project will, inter alia, degrade the quality of the Savannah River in terms of DO, the Project violates the anti-degradation principles of the South Carolina Pollution Control Act, S. C. Code Ann. §§ 48-1-10 et seq. (1998), and of the Federal Water Pollution Control Act (the "Clean Water Act" or "CWA"), 33 U.S.C. § 1251 et seq. (1998).

C. The Project May Result in a Taking of Shortnose Sturgeon in Violation of the ESA

The Project, by reducing DO concentrations in the Savannah River, may result in taking of an endangered species, the shortnose sturgeon, Acipenser brevirostrum, in violation of the ESA. Further, the Corps’ proposed sturgeon-related mitigation measures are inadequate to ensure that the purposes and goals of the ESA are achieved.

D. The Project May Result in a Harmful Increase in Chloride Levels in the Lower Savannah River

One significant side effect of the Project is predicted increase in salinity. According to the DEIS, the Project will, in all likelihood, cause chloride levels to increase proximate to the City of Savannah's raw water intake, located on a tributary of the Savannah River located approximately 8 miles upstream of the harbor project limits. DEIS, § 1.4. Any increase in the fresh water chloride content will have a significant economic impact on all industrial users.[5]

Furthermore, an increase in chloride concentrations will result in increased corrosion, a higher rate of equipment failure, and product quality problems at the plants of certain stakeholders. Any facility which emphasizes the re-use of process water will be placing itself at

greater risk of economic harm when including non-process-elements, including additional chlorides, in its processes. Regrettably, the Economic Impact portion of the Draft Feasibility Study fails to address the above or similar costs to stakeholders who utilize Industrial and Domestic ("I&D") water for boilers or for the direct processing of products.

The DEIS attempts to downplay the significant impact that increased concentrations of chloride will have on I&D water systems by suggesting that affected intakes can be moved or that the flow rate into such intakes can be artificially increased. DEIS, § 5, at 32. In its Comments to the Corps on the Project, however, the City of Savannah estimates the cost of water intake relocation to be approximately $46 million. See Comments of the City of Savannah (June 12, 1998 and July 7, 1998). The substantial amount of money required to compensate for the predicted change in chloride concentrations warrants additional attention in the EIS.

E. GPA's Modeling Efforts are Deficient with Respect to DO, Salinity, and Other Crucial Impacts of the Project on the Environment

GPA utilized several models in order to predict Project impacts on DO, salinity, and other crucial ecological factors. In the limited time available to it, the Harbor Committee has been able to solicit the views of Dr. James L. Martin, Ph.D., P.E., of AScI Corporation, on the Corps' modeling efforts. Dr. Martin's evaluation of the Corps' modeling efforts are set forth as Exhibit A to these comments.

F. The Corps' Letter response of the Project does not Comply with NEPA and its Implementing Regulations

NEPA requires that agencies of the federal government include in proposals for "major Federal actions significantly affecting the quality of the human environment a detailed statement" of, among other things: (1) the environmental impact of the proposed action; (2) any adverse environmental effects which cannot be avoided should the proposal be implemented; and (3) alternatives to the proposed action. 42 U.S.C. § 4332(C)(i)-(iii). Such agencies must also "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." Id. § 4332(E). Regulations implementing NEPA are found at 40 C.F.R. § 1500 et seq. (1997) (CEQ regulations) and 33 C.F.R. Part 336 (1997) (Corps regulations concerning discharge of dredged material into waters of United States).

The April, 1998 DEIS prepared by the Corps is insufficient for purposes of NEPA because, among other things,

(1) the Corps does not adequately discuss the environmental impacts of dredging to depths other than to the Corps-recommended 50-foot depth,

(2) the Corps does not identify any adverse environmental effects which cannot be avoided should the proposal be implemented, or which could be avoided through dredging to depths other than to 50 feet;

(3) the Corps does not state that its recommended alternative will, in all likelihood, violate the law of the State of Georgia;

(4) the Corps does not discuss DO or salinity concentrations at depths other than 50 feet;

(5) the Corps does not adequately discuss the impacts of the Project on the shortnose sturgeon and striped bass;

(6) the Corps has not conducted any studies of alternatives to its recommended 50 foot dredging depth which might resolve conflicts related to the existing, competing uses of the natural resources of the Savannah River;

(7) the Corps does not consider any mitigation measures related to the projected increase in salinity and decrease in DO for any of the alternatives;

(8) the Corps does not identify reasons why it selected the 50 foot depth alternative when the greatest benefits versus costs appear at a depth of 46 feet;

(9) flaws in the Corps' model prevent the Corps from providing an accurate statement concerning the Project's environmental impacts;

(10) given the Project's scope and complexity, the Corps does not provide sufficient time for the public to comment on the DEIS; and

(11) given the Project's scope, complexity, and significant environmental impacts, the Corps, as a general matter, has not conducted sufficient information gathering for the DEIS to meet NEPA's "detailed statement" requirement.

If finalized, the DEIS, as currently presented, would no doubt, be deemed by any reviewing court to be arbitrary, capricious, or otherwise not in accordance with the law.

4. Actions Needed

Stone can support the Project if the following actions are undertaken by the Corps and GPA. If however, these actions are not undertaken and the project goes forward as originally proposed, Stone can not support the deepening of the Savannah River.

A. A Technical Advisory Group is formed for the purposes of actively participating in the review and calibration of the modeling system applied to the Lower Savannah River Estuary.

Stone believes the model is capable of meeting the stated goals. A Technical Advisory Group should be employed to ensure that the concerns raised in Appendix A are properly addressed. Such a committee would consist of members of the Savannah Area Chamber of

Commerce's Harbor Committee, Georgia's Environmental Protection Division, South Carolina's Department of Health and Environmental Control, and the Federal Environmental Protection Agency Region IV. This has to be completed so that proper mitigation measures can be identified.

B. Mitigation measures are undertaken to eliminate the predicted DO deficit.

Stone believes that funding must be included in the project to undertake mitigation measures related to the predicted DO deficit. To support this effort, Stone, through the Savannah Area Chamber of Commerce's Harbor Committee commissioned LAW Environmental to study mitigation measures that could eliminate the predicted decrease in DO. LAW, assisted by Vanderbilt University professor Dr. Richard Speece, has developed a Preliminary Feasibility Study, a copy of which is attached as Exhibit B. In this study, LAW identified two alternative mechanisms for providing additional aeration to the River. Stone believes that funding for the "U-Tube" alternative should be included in the Project as the preferred mitigation measure.

C. Mitigation measures are undertaken to avoid the negative effects of increased chloride levels.

The City of Savannah has already provided comments regarding the necessity for mitigating the predicted increase in chloride levels. Stone agrees with these comments, and believes that the Project should proceed only if funds are included to undertake the necessary mitigation measures with respect to the predicted chloride increase (i.e., the Corps should ensure that the City's raw water intake structure is relocated to an area where chloride levels will not be increased).

D. A Supplemental EIS is Developed by the GPA and the Corps and Published for Public Comment.

To correct the NEPA deficiencies noted above, Stone believes that a Supplemental DEIS should be published and subjected to public comment before the Project is allowed to begin its construction phase. If the comments Stone, as set forth above, as well as those filed on behalf of other stakeholders, are not addressed the Project cannot proceed on sound legal footing.

5. Conclusion

Stone does not write these comments in order to thwart the Corps' efforts to ensure that the Savannah Harbor remains a viable commercial port of call both now and in the future. The purpose of these comments is to assist the Corps and the Georgia Ports Authority with consideration of reasonable alternatives and mitigation measures, which will not result in a shift of the costs of maintaining the Savannah as a multi-use estuary. Stone urges the Corps and Georgia Ports Authority to explore such alternatives and measures and to include them in the Project. Once incorporated into the Project, we believe the Corps' proposed dredging of the Savannah River can enjoy the support of all the members of the Savannah community.

Thank you again for the opportunity to comment on the April, 1998 Draft Environmental Impact Statement and related materials pertaining to the Corps' proposed dredging of the Savannah Harbor. Please do not hesitate to call if you have any questions.

Very truly yours,

C.F. "Chuck" Bogatie
General Manager

[1] DO is also consumed by the DO demands of NPDES-permitted point sources and non-point source runoff. In the lower Savannah River, however, the effects of point source consumption have been substantially mitigated (to the extent practicable) by specific treatment requirements and discharge limitations imposed through the NPDES permit program. Both the states and federal government are currently undertaking efforts to mitigate the effects of non-point sources on DO through the adoption f "best management practices" and the development of watershed-specific permits to manage storm water.

[2] The Corps' estimate of the amount of DO potentially removed from the River by the Project appears to understate the actual, anticipated reduction. This understatement is derived from flaws in the Corps' DO modeling program. For example, the Corps' Savannah River model does not take ammonia or nitrogenous biological oxygen demand ("BOD") into account. By omitting certain sources of BOD from the model, the Corps has understated the amount of BOD present in the River and, as a result, has overstated the amount of DO which may be present in the River after the Project is complete. This overstatement of DO, if corrected, may indicate that actual reductions in DO as a result of the Project are greater than predicted by the Corps. Thus, the Project may result in a greater violation of Georgia's water quality standard for the Lower Savannah River than otherwise predicted.

[3] It should be noted that, as of September, 1997, portions of the Savannah River contained concentrations of DO below Georgia's minimum criteria. See Report, Hydrodynamic & Water Quality Monitoring of the Lower Savannah River Estuary, July to September, 1997, App. C, Discrete QA/QC Data, ATM Synoptic Sampling Event 2, September 10-11, 1997, Lower Savannah River, at D-2-16 (noting DO concentrations as low as 0.43 mg/L at Synoptic Station SH-16). To the extent that the DEIS does not address these depressions in DO concentrations and their relationship to past or present Corps projects in greater detail, it is inadequate for purposes of NEPA. See generally infra. Section IV (discussion of DEIS non-compliance with NEPA).

[4] Based on a review of the DEIS and related materials, it is difficult to determine whether the Project will comply with Georgia's water quality standards. This difficulty is derived in large part from the Corps' failure to analyze changes in DO relative to the seasonal, instantaneous, minimum standards mandated under Georgia law. For example, a reduction of 0.5 mg/L DO would be more critical during periods of low flow and high water temperatures, when DO levels are already low. In contrast, a reduction of 0.9 mg/L would not necessarily be significant during periods of high flow and cooler temperatures, when DO resources are more abundant. On an absolute basis, however, the predicted 1 mg/L reduction in DO will, in all likelihood, violate the water quality standard for at least part of the year.

[5] For example, one member of the Harbor Committee estimates an increase in operating costs of about $500,000 per year if the chloride content in its boiler water treatment area were to increase from its current level (10 ppm) to 50 ppm. For increases beyond 50 ppm, that member would need to make significant capital expenditures ranging from $1,000,000 to $3,000,000, depending on the concentration, in order to compensate for the increase in chloride concentrations.

APPENDIX A

Report from James L. Martin, Ph. D., P.E.

Review: Hydrodynamic and Water Quality Modeling of the Lower Savannah River Estuary by ATM and ASA, prepared for the Georgia Ports Authority

Review: Hydrodynamic and Water Quality Modeling of the Lower Savannah River Estuary by ATM and ASA prepared for the Georgia Ports Authority

By: James L. Martin, Ph.D., P.E.
AScI Corporation

Date: 1 July 1998

Comments

Modeling System

1. The modeling system applied to the Lower Savannah River Estuary (WQMAP) seems appropriate for meeting the stated goals of the modeling study. The three-dimensional hydrodynamic and water quality model should adequately predict the variations in flows and water quality in the system due to the estuarine and river forcings, given appropriate model set up, boundary conditions, rates and other coefficients.

2. The model selected for application, WQMAP, appears to be comparable to other state-of-the-art three dimensional models. In addition, WQMAP includes grid generators and other supporting software which should make the model easier to implement, and potentially reduce the possibility of errors introduced in the construction of model input. The authors of the hydrodynamic code are well known. The subject reports provide an overview of the modeling structure. Supplemental material provided by ASA (1998) and from WEST (1996) indicate the boundary-rifted hydrodynamic and pollutant transport model has been applied to over 40 sites (ASA 998, WEST 1996). Muin and Spaulding (1997a,b) described the model formulations, testing of the model against analytical solutions, and the application of the hydrodynamic model to the Providence River. However, previous applications were not evaluated as part of this review.

3. The quality model component (based on the USEPA WASP model), as described in the subject reports, and supplemental information should be adequate for the simulation of processes of importance in the Savannah River estuary.

Model Application (General Comments)

4. The calibration of the model, based upon information provided, appears to have been adequate with regard to the estuarine hydrodynamics and salinity variations.

   A) The hydrodynamic model predictions seem reasonable, particularly for lower reaches of the estuary for both water surface elevations and velocities.

B) Salinity comparisons also appear reasonable. Although difficult to discern in black and white copies of the figures, it appears that mean (tidally averaged) salinities were reasonably captured. The maximum salinities appeared to be overestimated in the vicinity of Fort Jackson and underestimated at upper stations, particularly in the Little Back River. In the Little Back River, the peak salinities were underestimated by about a factor of two (maximum observed of 11 ppt as compared to the maximum predicted of 4.0 ppt). In subsequent conversations with ATM staff it was indicated that additional sensitivity analyses, not included in the subject reports, had been performed to determine factors affecting these predictions. The 90th percentile frequency for this station was only 3.2, indicating that these maximums occurred infrequently.

1. The intended purpose of the DO model, stated in the subject report to be a simplified application, was to estimate the system's response to the proposed deepening under different river discharge scenarios. The screening-level application should be adequate for that intended purpose. That is, the model should be adequate to approximate the response (or direction of change) that may occur between the scenarios simulated, but the estimated magnitude of that change is only applicable to the set of conditions simulated (including boundary conditions and specified kinetic rates). The uncertainty associated with the magnitude of the estimated change in DO is unknown. Different conditions and rates could produce different results, so that the magnitude of that predicted change could potentially vary considerably for other conditions.

2. For this application, a rigorous calibration of the model to DO, and factors affecting DO, was not performed, nor did there appear to be sufficient field data collected to support such an application. Loadings from various sources (some boundaries, point and non-point sources, sediments, etc.) were not quantified by the associated field studies. Rates measured and/or used in previous modeling studies were not utilized. Some processes know to have a lesser impact on DO predictions in the Savannah River Estuary (algal productivity, nitrogen transformations) were not simulated.

3. The modeling structure should be adequate to address other intended purposes or issues. However, the specific purpose of the application would affect the manner in which it is applied. The application of the model to other intended purposes may require a more detailed field and model application in order to estimate site-specific values of rates used in the model and to assess the accuracy of model predictions. For example, if the study purpose was to assess the impact of loads on instantaneous DO values (rather than statistical averages, as in the subject application) for comparison with DO standards, or to identify critical conditions affecting DO, a different field and modeling approach should have been used.

4. A sensitivity analysis should be performed with the existing model to estimate the impact of the uncertain coefficients on model predictions to provide some bounds on those predictions, for the conditions simulated. A sensitivity analysis could also be performed to estimate the impact of other, potentially more critical conditions, such as those previously observed to have resulted in a more severe DO depletion that was observed in this study.

Specific Comments

5. The coefficients and forcings (boundary conditions, etc.) used in the model application were primarily literature values. In some cases, the values used were not specified in the subject report, so that their potential impact could not be evaluated. Some of these values were determined in subsequent meetings with ATM staff. However, The use of literature values rather than site specific data makes the model predictions uncertain, particularly for model projections of dissolved oxygen, which is influenced by a variety or processes.

6. Loads were specified based upon monthly averaged data from the EPA Discharge Monitoring Repots (DMRS) filed with the EPD by the NPDES permit holders. It seemed from the report that the BOD_u data from the DMRs was used to compute loadings, so that the f-ratios used to convert from BOD_5 to BOD_u were literature values, rather than the available site-specific data. However, the report implies that measured BOD_u values were used for the period. It was not clear from the subject report which is the case. In subsequent meetings, it was determined that the literature values (f ratios) were used in the model simulations, rather than available site-specific data.

7. The subject report indicates that CBOD and dissolved oxygen concentrations were prescribed for inflows, but the values used were not specified in the subject report and their potential impact on model predictions could not be assessed. Previous studies by the Georgia EPD indicated that the upstream boundary impacted down-stream reaches. The Georgia EPD indicated that 90 % of these boundary loadings will flow into the down-stream study area. In subsequent meetings with ATM it was determined that measured values of BOD and DO were applied for inflows.

8. The report states that the salinity, BOD_u and dissolved oxygen concentrations during the ebb flow (inflow from the storage areas) from the extensive marsh areas were prescribed, but the values used were not specified and therefore could not be assessed. Previous studies by the Georgia EPD indicated that the marsh areas are generally in equilibrium and do not directly affect water quality in the study area. Previous studies note an exception is the inland marsh of the Savannah National Wildlife Refuge, where dissolved oxygen concentrations during ebbing flow were substantially reduced over those into the marsh during the flood. In subsequent meetings, ATM staff indicated measured values were used at the marsh boundaries.

9. For $CBOD_u$, and dissolved oxygen, the subject report indicates that open (ocean) boundary conditions were set to prescribed values during inflow. The values used were not specified, so their potential impact could not be assessed. Previous studies by the Georgia EPD suggested the importance of the open boundary condition, and indicated that if the open boundary BOD_u equals 3.0 mg / l, then about 2.5 million pounds of BOD_u, could be loaded to the system each day. In subsequent meetings, ATM staff indicated that DO was assumed to be saturated and BOD was determined by calibration for the open boundary. This boundary, and its impact on predictions, would then be very uncertain, given the uncertainty in the other loadings.

10. The deoxygenation rate specified for BOD deoxygenation ("decay") was 0.04 day^{-1}. This value seems generally consistent with values measured in Table 9-1 of the monitoring report, but varies considerably from values used in previous modeling studies by the Georgia EPD of 0.1 day^{-1}. Previous modeling studies also simulated NBOD as well as CBOD, with deoxygenation rates for NBOD of 0.07 to 0.08. The Georgia EPD also noted an immediate oxygen demand term in their previous studies.

11. The subject report indicates a constant sediment oxygen demand (SOD) was specified for the entire model domain of 1.0 g m^{-2} day^{-1} (Table 5.2). In subsequent meetings, it was determined that the value was varied from 1.0 to 1.5 g m^{-2} day^{-1}. In previous studies, the Georgia EPD collected SOD measurements at 8 stations within the study area, with values ranging from below 1.0 to around 2.0. The highest measured values were near inland freshwater marsh areas in Middle and Little Back rivers (near 3.5 g m^{-2} day^{-1}). Lowest values occurred in the Back River above the tide gate and the main channel of the Savannah River inland to Ebenezer Landing, with values of about 0.5 g m-2 day-1 The Georgia EPD measured SOD values were 1.6-1.7 g m^{-2} day^{-1} in the north and south channels, while values determined by model calibration were 1.75-2.25 g m^{-2} day^{-1}. SOD rates determined by the USACOE and used by Hall (1987) in the application of CE-QUAL-W2 to the estuary varied from 1.2 to 2.9 g m^{-2} day^{-1}. It is not known if these measurements reflect present conditions or what the potential SOD would be in the sediments exposed during the channel deepening.

12. A diffusive exchange coefficient of 2.5 X 10^{-4} m^2 day^{-1} was specified. It is not clear in the subject report how this rate (approximately molecular diffusion) was used, or how it may impact model predictions. In subsequent meetings with ATM, it was determined that this was a pore water diffusion rate and was not used in predictions.

13. A reaeration rate of 2.5 day^{-1} was specified, as stated in the subject report, rather than using one of the alternative methods included in the model to compute the rate. The O'Connor-Dobbins formulation was used to compute reaeration rates in previous modeling studies, but the computed rates are not known and can not be compared to the specified value. In subsequent meetings with ATM, it was determined that the value was specified since it was not clear which combinations of depths and velocities should be used in formulations for computing reaeration.

14. Photosynthesis and respiration rates were not specified. These rates were used in previous modeling studies but were considered to be minor components of the total oxygen dynamics, as suggested in this study.

15. Ammonia or nitrogenous BOD (NBOD) were not included in simulations, although they were in previous modeling studies.

16. No comparisons were provided in the subject report for predicted BOD concentrations, for either a quantitative or qualitative evaluation. In subsequent meetings, it was indicated that at least qualitative comparisons of BOD predictions were made, and open boundary conditions (rather than loads) adjusted to obtain a qualitative agreement.

17. The dissolved oxygen model predictions were not compared to observed time-varying data in the subject report, as were salinity predictions. Instead, model predictions were compared to selected percentile frequencies similar to comparisons provided in tables for salinity. No statistical comparisons were provided (means, maximum, minimum, standard errors, etc.) as for salinity predictions. The comparisons between model predictions did seem to exhibit a reasonable degree of accuracy, in comparison with mean values, given that this is a simplified application, as indicated in the report. Typically, the median relative error of detailed dissolved oxygen model applications is on the order of 10 %, or about 0.5 mg/L. The relative error associated with a screening level study, such as performed for this project, would be expected to be considerably greater.

18. It is not known if the conditions to which the model was calibrated and applied represent critical conditions for the estuary. Conditions measured by the Georgia EPD in 1989 and 1990 (EPD 1990, 1991) indicate pockets of low DO water over relatively large areas. Unlike a riverine system, the critical conditions may not be those with the lowest flow, but rather those that may tend to trap low DO water, or oxygen demanding materials, in certain areas, such as was observed in 1989 and 1990.

19. The model was calibrated to percentile frequencies, rather than absolute values. Therefore, it appears to have been calibrated to represent average rather than extreme conditions. For example, tidally averaged observations (Table 4-2) at the 10 percentile frequency were generally above 3.0 mg/L, while instantaneous values (e.g. Figure 4-6-7) of less than 2.0 mg/l were observed. The applicable DO standards are instantaneous values, rather than averages.

20. The temperature conditions used in the application of the dissolved oxygen model were not specified in the subject report. During subsequent meetings, it was determined that temperature was specified, based upon field data collected as part of this study, and not simulated.

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PROTECTION OF INSTREAM DISSOLVED OXYGEN

Decisions about instream dissolved oxygen (DO) protection, including: water quality criteria, NPDES permit limits and State Water Quality Certifications are appropriately made by considering DO impacts at DO-stressful ("critical") conditions. Critical conditions typically include specified water temperatures, stream flows, segment boundary conditions and (for tidal segments) tide ranges.

The normal approach for considering the DO impact of a proposed action is to construct and calibrate an appropriate water quality model using field data that are as close to DO-critical conditions as possible. Next, the "field-calibrated model" is adjusted to simulate selected combinations of critical conditions. This critical-conditions model" is then used to predict the water-quality impact of proposed actions-

In the DEIS for the proposed Harbor expansion, there are no critical conditions DO simulations. The DO impact of the proposed project is evaluated only within the context of the 1997 field-calibrated model which is not representative of critical conditions for DO. This lack of critical conditions DO projections for the proposed project is a significant shortcoming that needs to be addressed in order to reasonably consider DO impacts and potential mitigation measures as part of the project.

Georgia EPD has previously assumed a DO-critical water temperature of 300C for Savannah Harbor with a 7Q 10 low flow for August (assumed to be the hottest month) at the Clyo gage. (EPD _____). Figure 1 presents average (2-year return) and extreme (10-year and 25-year return) seasonal highs of daily average air temperatures at the Savannah Airport for 1-day to 21-day durations. Figure 2 compares the 7-day moving average of daily air temperatures in Savannah during the 1997 DEIS field sampling period to the 7-day duration daily air temperature statistics for long-term record (1954-1997). Figure 2 indicates that daily air temperatures during the 1997 sampling period were well below (5 to 150F below) the average (2-year return) and extreme (10-year return) expected high temperatures. During September 1997, when special regulated low-flow conditions were arranged, the air temperatures in Savannah, already well below seasonal norms, were rapidly decreasing. This rapid decrease temperature decrease in September 1997 was reflected in the water temperature data reported in the DEIS. The rapid decrease in temperatures during the 1997 study period raises concern that vertical mixing may have been impacted by transient temperature-induced density gradients that would not exist during critical high temperature conditions.

Georgia's instream DO criteria are applicable for all streamflows exceeding the 7Q1O low flow except for flow-regulated stream segments where the DO criteria are applicable for all flows. While the Savannah River is definitely a regulated segment downstream from Clark Hill Dam, EPD has previously used the August 7Q1O low flow as a DO-critical low flow condition for Savannah Harbor. Using the period of streamflow record (Clyo gage) from 1954 (after Clark Hill Dam was operating) through 1997, low-flow frequency analyses were conducted. Figure 3 depicts seasonal (May-October) low flows for normal (2-year return) and extreme (10-year and 20-year) low-flow conditions as well as the "period of record"

extreme low flows recorded at the Clyo gage. The record daily low flow is 4400 cfs (July 22, 1988) and the seasonal (May-October) 7Q1O is 5,300 cfs-

Figure 4 compares the 7-day moving average of daily streamflow at the Clyo gage during the 1997 DEIS field sampling period to the 7-day duration low-flow statistics. In July and August of 1997, streamflows were significantly higher than normal low-flows. But as a result of special release arrangements at Clark Hill Dam, 7-day average flows were intentionally held at, or slightly below, the August 7Q10 of 6050 cfs for approximately two weeks in September 1997 to create a critical low-flow condition. One possible concern with this created low-flow condition is the water quality "memory" of the system related to higher flows immediately preceding the special low flow conditions of September.

As for critical tide conditions, EPD has previously assumed that Spring tides are the most DO-stressful tides because higher high tides push saline water further upstream and thereby reduce DO saturation concentrations. While this may be the case, it would be prudent to evaluate both Spring tides and Neep tides to be certain that density-induced DO gradients are properly considered.

Figure 1
Savannah International Airport
High Temperature Reference Frame May-October Season
Period of Record 1954-1997

This figure was a graph showing how the Daily Average Temperature varied with Duration.

Figure 2
Daily Average Air Temperature from the Savannah
International Airport, Savannah, Georgia Comparison of 1997 7-Day
Moving Average to
7-Day High Temperature Statistics
Period of Record 1954-1997

This figure was a graph showing how the Air Temperature varied with Month.

Figure 3
Savannah River at Clyo Gage
Low Flow Reference Frame May-October Season
Period of Record 1954-1997

This figure was a graph showing how Flow varies with Duration.

Figure 4
Mean Daily Streamflow Savannah River at Clyo Gage
Comparison of 1997 7-Day Moving Average to
7-Day Low Flow Statistics
Period of Record 1954-1997

This figure was a graph showing how Flow varied with Month.

APPENDIX B

Supplemental Oxygenator of Savannah Harbor

CONCEPTUAL DESIGN

Prepared by Dr. R. E. Speece
Vanderbilt University
July 2, 1998

BACKGROUND

Natural reaeration of water bodies is directly related to turbulence at the air/water interface and inversely related to depth of the water column. Savannah Harbor is characterized by a pooled, flat water surface with little turbulence except for tides. Natural reaeration is currently affected by the 42-ft navigation channel. Plans to deepen the harbor to 50 feet will further reduce dissolved oxygen (DO) conditions in the Lower Savannah River because of the effect depth has on reaeration.

Supplemental oxygenation could mitigate the reduction in DO due to the proposed channel deepening. Examples of installations in the United States where supplemental oxygen is presently used include:

1. **Richard B. Russell Reservoir on the Savannah River:** bubble diffusers have been in operation for a number of years that have the capacity to add up to 100 tons of pure oxygen per day (tons/day). Oxygen is injected into fine bubble diffusers and is efficiently absorbed within the hypolimnion in the free rising bubble plume because of the 140-ft depth.

2. **Tombigbee River:** two supplemental oxygen installations are operated to mitigate a oxygen sag downstream of two industrial discharges. These installations pass water down 175-ft U-Tube shafts. Pure oxygen is injected at the inlet and is carried down to the high hydrostatic pressurization region at the bottom and then back to the water surface. These two systems can dissolve 30 tons/day in a side stream of about 140 MGD containing 50 mg/L of DO in the effluent which is diffused back to the river. These systems had a capital cost of approximately $12,000,000.

3. **California Lake:** this supplemental system utilizes a "Speece Cone" which pulls water from the bottom, passes it down through an inverted cone maintained with an oxygen bubble swarm which raises the DO concentration to 100 mg/L with the cone sitting on the bottom at 100 feet. The highly oxygenated water is then discharged through a diffuser on the bottom of the lake. This California application can supplement 9 tons/day.

4. **Lake "Soaker" Systems:** this application utilizes plastic tubing similar to the porous hose used in gardens. It is strung along the lake bottom on a support system which includes weights at regular intervals to anchor the hose and buoyancy

chambers to keep it suspended off the lake bottom. Pure oxygen is forced into the system and permeates the porous tubing to form a source of small diameter bubbles which rise freely to the surface. Oxygen absorption efficiency is determined by the depth of the water column through which the oxygen rises. When used in lakes with depths exceeding 100 feet, 90 percent absorption is possible. In a 50-ft water column, oxygen absorption could be as much as 70 percent if the alpha factor was one and the water had low salinity and was cold. Fine bubble systems are more adversely affected by a reduced alpha factor than are the U-Tube or cone applications. Under saline conditions, warm water temperatures (30^0 F), 50-ft depths, and an alpha factor less than one, a "soaker" tube installation for the Savannah Harbor was estimated by a vendor to have an efficiency in the range 65 percent.

Economics favor the use of pure oxygen versus air because the cost of electricity to dissolve a ton of oxygen from air is more than the cost of pure oxygen if the DO target in the side stream exceeds 4 to 5 mg/L. This greatly minimizes the required flow rate in the side stream to produce a given amount of oxygen per day.

FEASIBILITY OF SUPPLMENTED OXYGENATION FOR SAVANNAH HARBOR

There are two main aspects to oxygen supplementation of a water body -- the oxygenation device itself and the distribution/mixing of the highly oxygenated side stream within the water body. Although Savannah Harbor represents a different configuration than the examples of other installations listed above, the tidal excursions in Savannah Harbor are exceptionally beneficial for distribution/mixing of the oxygenated water. Tidal excursions allow for the installation of a number of fixed oxygenation devices several miles apart and could provide for relatively uniform distribution of the supplemented oxygen. Fewer, larger oxygenation devices also allow for economy scale.

OXYGENATION DEVICES

Oxygen, even pure oxygen, is relatively insoluble and requires special care in the design of an oxygenation device that will achieve efficient oxygen absorption. The efficiency of absorption is key because the cost of pure oxygen is significant ($100/ton). Nominally, oxygen bubbles must be retained in water contact for about 60 to 100 seconds to achieve 80 to 90 percent absorption. There are three devices that have proven to be capable of efficient oxygen absorption: the U-Tube system, the Speece Cone, and "soaker" bubbler systems.

U-Tube Oxygenation System

This system incorporates the passage of oxygen bubble/water mixture down a deep shaft (e.g., about 200 feet) and back to the surface. The prolonged bubble contact time and the hydrostatic pressurization at depth achieve efficient oxygen absorption and very high DO concentrations in the discharge.

Speece Cone

This system incorporates a downward flow of water through an expanding cone. The high inlet velocity prevents the oxygen bubbles from escaping at the top as well as providing turbulence to generate a bubble swarm with exceptionally high oxygen/water interfacial area to enhance the oxygen transfer rate. As the cone expands, the downward water velocity decreases to the point where it is less than the buoyant velocity of the bubbles. Thus, they cannot escape out the bottom and are effectively "trapped" in the cone to enable efficient oxygen absorption efficiency. The DO in the discharge is proportional to the hydrostatic head inside the cone. At 100 feet of pressure depth inside the cone, the effluent DO can be 100 mg/L. At ambient pressure in the cone, the effluent DO would be about 25 mg/L. Therefore, it is advantageous to operate the cone as deep as possible.

"Soaker" Tubing System

This system utilizes porous tubing that would be located in the deepest water possible (e.g., the navigation channels of Savannah Harbor). Vendor-provided sizing information assumes that 3 pounds of oxygen can be dissolved per linear foot of tubing per day at 65 percent oxygen absorption efficiency. Based on that vendor-provided information, the bubbler system would require approximately six miles of tubing in the navigation channel. Drawbacks of this system in a harbor system are related to potential encounters with shipping activity (e.g., anchoring) and annual maintenance dredging activities. The anchoring system would have to be designed to withstand strong currents and the tubing would have a typical life span of only two to four years.

SYSTEM REQUIREMENTS AND COMPARISONS

Preliminary calculations indicate that 50 tons per day would be required to mitigate the DO reduction predicted for the proposed harbor expansion project. This requirement could be met with two U-Tube systems consisting of a 7-ft. diameter concentric pipe inside a 10-ft. diameter shaft 200 feet deep. A flow of 150 MGD would be withdrawn from the harbor by a 500 hp pump through the new intake structure. Pure oxygen would be injected at the top of the 7-ft. diameter pipe and the oxygen bubble/water mixture would flow down to the bottom and back to the surface in the outside annular area. The discharge containing over 40 mg/L of DO would be discharged into the harbor. (Salt water has a lower DO saturation than fresh).

The estimated capital costs for two 25-tons per day U-Tube systems would be $24,000,000 based on capital costs for the Tombigbee River system. High capital costs are related to the intake and diffuser structures that will be required to place the U-Tube system on the shore adjacent to the harbor.

Operating costs are primarily the cost of the pure oxygen which was estimated at $100 per ton or $5,500 per day based on a 90 percent oxygen absorption efficiency. Assuming oxygen supplementation would be required, on average, 100 days per year, annual oxygen costs would be approximately $550,000.

Alternatively, a Speece Cone could be utilized by anchoring cone(s) to pile supports outside the navigation channel. These devices would consist of a cone 25 feet high and 20 feet in

diameter at the bottom. Water would be drawn from the harbor and forced down into the top of the cone where pure oxygen will be injected. A 200 hp pump would move 50 MGD of water through the cone. The discharge DO concentration would depend on the water depth at which is operates. If the cone sat in 50 feet of water, the discharge DO would be about 50 mg/L. Such an installation could add 10 tons/day. If the cone is in 25 feet of water, the discharge DO would be proportionately reduced and proportionately more water would have to be pumped through a larger installation to supplement 10 tons per day.

The discharge port at the bottom of the cone would be directed perpendicular to the harbor channel at a discharge velocity of about 20 fps so that momentum of the jet would carry the oxygenated water to the opposite side of the navigation channel. Longitudinal mixing along the navigation channel would be through tidal excursions.

Five of these cones installed at regular intervals along the 15-mile harbor would be required to meet the estimated 50 tons/day. If a 90 percent oxygen absorption efficiency was achieved then 55 tons/day would be required. It was estimated that the total capital costs for five oxygenated cones would less than half of the $24,000,000 estimated for the two U-Tube systems.

A "soaker" tubing system that would provide 50 tons/day would require about six miles of tubing. Based on a 65 percent oxygen absorption efficiency, 75 tons/day would be required to meet the 50 tons/day target.

The present worth of the oxygen at 8% and for 25 years would be a multiplier of 10.7. Therefore, the present worth for oxygen for the U-Tube and Speece Cone would be 10.7 x $550,000/yr = $5,900,000. For the bubbler it would be 10.7 x $750,000 = $8,000,000. If the bubbler had a capital cost of $2,500,000 for a six mile long system and had to be replaced every four years, the annual cost could be .22 x $2,500,00 = $550,000 per year, with an equivalent present worth of
10.7x $550,000 = $5,900,000.

Overall comparison of the three supplemental oxygenation systems.

U-Tube	**Cone**	**Bubbler**
Equipment on Land	Equipment in harbor outside of navigation channel	Equipment within navigation channel
No impacts to shipping	No impacts to shipping	Potential impacts to shipping
Dredging not impacted	Dredging not impacted	Potential impacts from annual dredging
25 year life	25 year life	2-4 year life

90 percent oxygen absorption efficiency	90 percent oxygen absorption efficiency	65 percent oxygen absorption efficiency
Anchoring will not impact system	Anchoring will not impact system	Anchoring may impact system
Two installations over 15 miles of channel	Five installations over 15 miles of channel	Six miles of tubing over 15 miles of channel
Oxygen present worth present worth $5,900,000	Oxygen present worth $5,900,000	Oxygen $8,000,000
System present worth $24,000,000	System present worth <$12,000,000	System present worth $5,900,000

Letter response

STONE CONTAINER CORPORATION

P.O. Box 548
1 Bonnybridge Road
Savannah, Georgia 31402

Date: July 7, 1998

1. COMMENT: At the outset Stone supports economic expansion of the Savannah River but wishes to stress that it is not our intention to compromise this harbor deepening project. Rather Stone has identified a number of concerns that we believe can and must be addressed to ensure that the integrity of the Harbor is protected and that the other users of this resource are not left with the responsibility of mitigating any impacts that the Project may have on the Savannah River.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

2. COMMENT: Comment Summary -- The Project is projected to lower concentrations of DO in affected areas of the Savannah River to concentrations below those permissible under GA law. In addition, the Project's reduction of DO concentrations violates anti-degradation principles central to GA's, SC's, and federal regulatory schemes designed to protect water quality. The Project is also predicted to increase salinity levels in the river in a manner that will substantially and negatively impact the undersigned. Further, the Corps' use of river modeling with respect to Project impacts on DO and salinity levels contain numerous deficiencies. Stone believes that without mitigation features to alleviate the negative impacts the Corps' discussions of the Project and Project impacts do not comply with the requirements of NEPA. Stone believes that the Project should proceed only if cost estimates for such mitigation measures are properly included in the Final Feasibility Study and a commitment to develop a Tier II EIS is included in a final EIS that responds to Stone's many concerns.

RESPONSE: See responses to individual statements of the comment summary (Comments 4, 5, 6, 7, and 9.9).

3. COMMENT: State and Federal Laws Implicated by the DEIS -- Expanding the Savannah Harbor as proposed in the DEIS does not comply various state and federal statutes, as well as the Corps' own regulations governing such projects. A discussion of the nature of these violations is briefly set forth below.

RESPONSE: The EIS adequately addresses all regulatory requirements of the project.

4. COMMENT: (A). The Project Predicts Violations of State DO Criteria -- The hydrodynamic model which has been used predicts that the Project will reduce concentrations of DO present in affected areas of the Savannah River in an amount up to 1 mg/L. According to the DEIS, the proposed dredging to a depth of 50 feet in the Front River "and, consequently higher stratification, [will] cause local reduction in the overall water column reaeration due to a reduced vertical mixing and increased distance from the bottom layers to the surface." The DEIS also notes that in the 50th percentile DO impacts increase between River Miles 12 and 20.5 to a maximum impact of 0.9 mg/L at the highest estimated flow rate; ninetieth percentile impacts indicate a reduction in DO concentrations of up to 1 mg/L near River Mile 17.

The predicted reduction in DO concentrations may cause the affected areas of the Savannah River to drop below the minimum DO concentrations established by the State of GA. Because the Project may reduce DO concentrations in violation of GA's WQ standards, the Corps should reevaluate its proposed dredging plans in order to ensure compliance with such standards.[4]

RESPONSE: In order for the project to proceed a 401 certification will need to be issued which evaluates the project impacts upon the water quality regulations of the State of Georgia. In addition, the project will mitigate for any changes in DO caused by the deepening.

5. COMMENT: (B). The Project Violates State and Federal Anti-Degradation Principles -- The Project, by reducing DO concentrations below those permitted under GA law, violates that State's anti-degradation mandate. In addition, because the Project will degrade the quality of the Savannah River in terms of DO, the Project violates the anti-degradation principles of the SC Pollution Control Act and of the Federal Water Pollution Control Act.

RESPONSE: In order for the project to proceed a 401 certification will need to be issued which evaluates the project impacts upon the water quality regulations of the State of Georgia. In addition, the project will mitigate for any changes in DO caused by the deepening.

6. COMMENT: (C). The Project May Result in a Taking of Shortnose Sturgeon in Violation of the ESA -- The Project, by reducing DO concentrations in the Savannah River, may result in taking of an endangered species, the shortnose sturgeon, in violation of the ESA. Further, the Corps' proposed sturgeon-related mitigation measures are inadequate to ensure that the purposes and goals of the ESA are achieved.

RESPONSE: The project proposes to mitigate for decreases in DO so that such decrease will be avoided. Hence no adverse impact or takes of listed species is predicted to occur. However, the technologies and methodologies and economics to be considered for this avoidance strategy are complex and require further studies, and collaboration with agencies, stakeholders and concerned parties. These studies are scheduled to occur in the next phase of the program.

7. COMMENT: (D). The Project May Result in a Harmful Increase in Chloride Levels in the Lower Savannah River -- One significant side effect of the Project is predicted increase in salinity. According to the DEIS, the Project will, in all likelihood, cause chloride levels to

increase proximate to the City of Savannah's raw water intake. Any increase in the fresh water chloride content will have a significant economic impact on all industrial users.[5]

Furthermore, an increase in chloride concentrations will result in increased corrosion, a higher rate of equipment failure, and product quality problems at the plants of certain stakeholders. Any facility which emphasizes the re-use of process water will be placing itself at greater risk of economic harm when including non-process-elements, including additional chlorides, in its processes. Regrettably, the economic analysis fails to address the above or similar costs to stakeholders who use Industrial and Domestic water for boilers or for the direct processing of products.

The DEIS attempts to downplay the significant impact that increased concentrations of chloride will have on I&D water systems by suggesting that affected intakes can be moved or that the flow rate into such intakes can be artificially increased. In its Comments to the Corps on the Project, however, the City of Savannah estimates the cost of water intake relocation to be approximately $46 million. The substantial amount of money required to compensate for the predicted change in chloride concentrations warrants additional attention in the EIS.

RESPONSE: The EIS will be revised to include further studies of the cause and effect relationship between salinity increases from the project and chloride levels at the City's water intake. The project will also include costs for the potential mitigation efforts resulting from an increase in chlorides. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

8. COMMENT: (E). <u>GPA's Modeling Efforts are Deficient with Respect to DO, Salinity, and Other Crucial Impacts of the Project on the Environment</u> -- GPA used several models in order to predict Project impacts on DO, salinity, and other crucial ecological factors. In the limited time available to it, the Harbor Committee has been able to solicit the views of Dr. James L. Martin, Ph.D., P.E., of AScI Corporation, on the Corps' modeling efforts. Dr. Martin's evaluation of the Corps modeling efforts are set forth as Exhibit A to these comments.

RESPONSE: Review of the Salinity and Dissolved Oxygen Model has been done by experts representing the United States Fish and Wildlife Unit (Salinity), the Environmental Protection Agency (Salinity and Dissolved Oxygen), as well as James Martin of ASCI for the local industries and the Chamber of Commerce (Salinity and Dissolved Oxygen). The United States Fish and Wildlife representative has agreed that the salinity model as presented in the EIS is sufficient for evaluating the project impacts. The EPA representative has identified that both the salinity and dissolved oxygen model is sufficient for evaluating the project impacts. James Martin in a meeting identified that the salinity model as applied is sufficient for evaluating the project impacts. He also agreed that the model is an appropriate tool for evaluating the impacts to dissolved oxygen but he feels that certain simplifying assumptions in the application of the model are not sufficient. Additional refinements to the dissolved oxygen model are to be completed within the CED phase and will be reported within the Tier II EIS to be completed during the CED phase. Additionally measurements made in the Summer of 1997 identify that the system at present violates the state standard of a dissolved oxygen concentration not less than 3.0 mg/L at any time.

9. COMMENT: (F). The Corps' Letter response of the Project does not Comply with NEPA and its Implementing Regulations -- NEPA requires that federal agencies include in proposals for "major Federal actions significantly affecting the quality of the human environment a detailed statement" of, among other things: (1) the environmental impact of the proposed action; (2) any adverse environmental effects which cannot be avoided should the proposal be implemented; and (3) alternatives to the proposed action. Such agencies must also "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources."

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

10. COMMENT: The April, 1998 DEIS prepared by the Corps is insufficient for purposes of NEPA because, among other things,

(1) the Corps does not adequately discuss the environmental impacts of dredging to depths other than to the Corps-recommended 50-foot depth,
(2) the Corps does not identify any adverse environmental effects which cannot be avoided should the proposal be implemented, or which could be avoided through dredging to depths other than to 50 feet;
(3) the Corps does not state that its recommended alternative will, in all likelihood, violate the law of the State of Georgia;

(4) the Corps does not discuss DO or salinity concentrations at depths other than 50 feet;
(5) the Corps does not adequately discuss the impacts of the Project on the shortnose sturgeon and striped bass;
(6) the Corps has not conducted any studies of alternatives to its recommended 50 foot dredging depth which might resolve conflicts related to the existing, competing uses of the natural resources of the Savannah River;
(7) the Corps does not consider any mitigation measures related to the projected increase in salinity and decrease in DO for any of the alternatives;
(8) the Corps does not identify reasons why it selected the 50 foot depth alternative when the greatest benefits versus costs appear at a depth of 46 feet;
(9) flaws in the Corps' model prevent the Corps from providing an accurate statement concerning the Project's environmental impacts;
(10) given the Project's scope and complexity, the Corps does not provide sufficient time for the public to comment on the DEIS; and
(11) given the Project's scope, complexity, and significant environmental impacts, the Corps, as a general matter, has not conducted sufficient information gathering for the DEIS to meet NEPA's "detailed statement" requirement.

RESPONSE:

10.1 The proposed scope of the DEIS was stated as a "worst case scenario" addressing the potential impacts of the deepest alternative, a 50 foot channel. All other alternative project depths would have less impact. Additional studies will be performed in the CED phase to evaluate alternative depths.

10.2 Additional studies will be performed in the CED phase to evaluate alternative depths
10.3 The EIS adequately addresses all regulatory requirements of the project.

10.4 Additional studies will be performed in the CED phase to evaluate alternative depths

10.5 The project provides full disclosure of potential adverse impacts to SNS and SB, especially impacts from DO decrease and salinity increase, as well as proposals for avoiding these impacts.

10.6 Additional studies will be performed in the CED phase to evaluate alternative depths.

10.7 The EIS will be revised to provide mitigation of project impacts on chloride levels at the City's water intake and dissolved oxygen levels in the Savannah Harbor. The estimated costs of mitigation have been included in the project costs.

10.8 The Economic Appendix has been revised to support a NED and Recommended plan selection of a -48 foot project depth. GPA concurs with this selection and has selected the -48 foot project depth as the Locally Preferred Plan.

10.9 Review of the Salinity and Dissolved Oxygen Model has been done by experts representing the United States Fish and Wildlife Unit (Salinity), the Environmental Protection Agency (Salinity and Dissolved Oxygen), as well as James Martin of ASCI for the local industries and the Chamber of Commerce (Salinity and Dissolved Oxygen). The United States Fish and Wildlife representative has agreed that the salinity model as presented in the EIS is sufficient for evaluating the project impacts. The EPA representative has identified that both the salinity and dissolved oxygen model is sufficient for evaluating the project impacts. James Martin in a meeting identified that the salinity model as applied is sufficient for evaluating the project impacts. He also agreed that the model is an appropriate tool for evaluating the impacts to dissolved oxygen but he feels that certain simplifying assumptions in the application of the model are not sufficient. Additional refinements to the dissolved oxygen model are to be completed within the CED phase and will be reported within the Tier II EIS to be completed during the CED phase. Additionally measurements made in the Summer of 1997 identify that the system at present violates the state standard of a dissolved oxygen concentration not less than 3.0 mg/L at any time.

10.10 A 15 day extension to the public comment period was provided.

10.11 The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

11. COMMENT: If finalized, the DEIS, as currently presented, would no doubt, be deemed by any reviewing court to be arbitrary, capricious, or otherwise not in accordance with the law.

RESPONSE: The EIS has been revised to address these concerns.

12. COMMENT: Actions Needed -- Stone can support the Project if the following actions are undertaken by the Corps and GPA. If however, these actions are not undertaken and the project goes forward as originally proposed, Stone can not support the deepening of the Savannah River.

A. A Technical Advisory Group is formed for the purposes of actively participating in the review and calibration of the modeling system applied to the Lower Savannah River Estuary. Stone believes the model is capable of meeting the stated goals. A Technical Advisory Group should be employed to ensure that the concerns raised in Appendix A are properly addressed. This has to be completed so that proper mitigation measures can be identified.

B. Mitigation measures are undertaken to eliminate the predicted DO deficit. Stone believes that funding must be included in the project to undertake mitigation measures related to the predicted DO deficit. To support this effort, Stone, through the Chamber of Commerce, commissioned a study of mitigation measures that could eliminate the predicted decrease in DO. LAW, assisted by a Vanderbilt University professor, has developed a Preliminary Feasibility Study, a copy of which is attached as Exhibit B. In this study, LAW identified two alternative mechanisms for providing additional aeration to the River. Stone believes that funding for the "U-Tube" alternative should be included in the Project as the preferred mitigation measure.

C. Mitigation measures are undertaken to avoid the negative effects of increased chloride levels. The City has already provided comments regarding the necessity for mitigating the predicted increase in chloride levels. Stone agrees with these comments, and believes that the Project should proceed only if funds are included to undertake the necessary mitigation measures with respect to the predicted chloride increase (i.e., the Corps should ensure that the City's raw water intake structure is relocated to an area where chloride levels will not be increased).

D. A Tier II EIS is developed by the GPA and the Corps and published for public comment. To correct the NEPA deficiencies noted above, Stone believes that a Tier II DEIS should be published and subjected to public comment before the Project is allowed to begin its construction phase. If the comments Stone, as set forth above, as well as those filed on behalf of other stakeholders, are not addressed the Project cannot proceed on sound legal footing.

RESPONSE: 12.A The mitigation process described in the EIS will include participation by a stakeholders group in addressing these issues.

12.B The estimated cost for the most expensive mitigation alternative presented, the "U-tube", has been included in the project costs. Further studies will be conducted in the CED phase to determine the final mitigation plan, which will be subject to a Tier II EIS.

12.C The EIS will be revised to include further studies of the cause and effect relationship between salinity increases from the project and chloride levels at the City's water intake. The project will also include costs for the potential mitigation efforts resulting from an increase in chlorides. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

12.D The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

13. COMMENT: Conclusion -- Stone does not write these comments in order to thwart the Corps' efforts to ensure that the harbor remains a viable commercial port of call both now and in the future. The purpose of these comments is to assist the Corps and GPA with consideration of reasonable alternatives and mitigation measures, which will not result in a shift of the costs of maintaining the Savannah as a multi-use estuary. Stone urges the Corps and GPA to explore such alternatives and measures and to include them in the Project. Once incorporated into the Project, we believe the proposed dredging of the river can enjoy the support of all the members of the Savannah community.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

APPENDIX A:

Review: Hydrodynamic and Water Quality Modeling of the Lower Savannah River Estuary by ATM and ASA

NOTE: The review of the water quality modeling that was included in Stone Container's letter as Appendix A is identical to that attached to the July 7, 1998, letter from the Savannah Area Chamber of Commerce. Responses to the comments contained in the review can be found in this Enclosure as the responses to the Chamber of Commerce letter.

APPENDIX B:

Supplemental Oxygenator of Savannah Harbor – Conceptual Design; prepared by Dr. R. E. Speeces, Vanderbilt University, July 2, 1998

NOTE: The conceptual design that was included in Stone Container's letter as Appendix B is identical to that attached to the July 7, 1998, letter from the Savannah Area Chamber of Commerce. Responses to the comments contained in the review can be found in this Enclosure as the responses to the Chamber of Commerce letter.

SYNERGISTIC DYNAMICS, INC.
PROFESSIONAL SERVICES DIVISION
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16 June 1998

Mr. William G. Bailey
Chief, Environmental Impact Analysis Section
US ARMY CORPS OF ENGINEERS -- Savannah District
100 West Oglethorpe Avenue
Savannah GA 31401

Re: Savannah Harbor Expansion Feasibility Study Report
Savannah Harbor Expansion Draft Environmental Impact Statement

Dear Mr. Bailey:

We have studied the referenced documents and greatly appreciate the opportunity to comment. The enclosed paper presents our concerns and discusses the reasons therefore.

Our primary concern is that the Georgia Ports Authority (GPA) has not made a case for its proposed 50' Plan, the most expensive and least cost-effective of the five depth scenarios studied in the subject Feasibility Study report. The 50' Plan is projected to cost $211,270,000, including construction interest. That is over 50% --- $72 million in current year dollars --- more than the projected cost of the 47' National Economic Development (NED) Plan. Considering the very substantial cost differential, GPA has a duty to make a compelling case for recommending the 50' Plan; it has not done so in the subject Feasibility Study report.

In order to give GPA sufficient time to make its case for the 50' Plan and to address issues and concerns that we understand are being raised by other parties having interests in the future well being of the Port of Savannah, we strongly recommend that the comment period be extended by at least 120 days and that two public hearings be held during that time period, one to address only the economic justification, the other to address all other concerns. We believe that two hearings would result in a more orderly process.

Very truly yours,

John C. Snedeker
Chairman and CEO

cc: U.S. Representative Jack Kingston
Senator Paul Coverdell
Senator Max Cleland
Georgia State Senator Eric Johnson
Hugh Tarbutton, Chairman, GPA
Douglas Marchand, Executive Director, GPA
Alan Beals, President, Savannah Area Chamber of Commerce

Professional Affiliations
National Contract Management Association
American Bar Association (Associate) Section of Public Contract Law
American Society of Naval Engineers
Society of Naval Architects & Marine Engineers

This paper presents the comments and concerns of Synergistic Dynamics, Inc. (SDI), a Savannah-based maritime consulting firm, regarding the Savannah Harbor Expansion Feasibility Study, dated April 1998, with revisions through 26 April 1998, prepared by the Georgia Ports Authority (GPA). The comments and concerns presented herein are our own, and do not reflect the position of any of our clients or any other organization with which we are associated.

Recommended Plan not Economically Justified

We find the economic justification for the 47' scenario, the National Economic Development (NED) Plan, to be compelling, but GPA failed, in our opinion, to adequately justify its selection of the 50' scenario as the Locally Preferred Plan/Recommended Plan rather than the NED Plan. As shown in the table below, the 50' Plan has a 50% higher cost, a lower annual benefit-to-cost ratio and a lower return on the investment compared to the 47' NED Plan and its net annual benefits are the lowest of the five scenarios studied.

Item	**47' (NED)**	**50'**
TOTAL COST (including construction interest)	$139,537,000	$211,270,000
ANNUAL COSTS AND BENEFITS		
Adjusted annual cost (1)	$12,240,000	$16,540,000
Annual benefits	18,709,000	19,470,000
Net annual benefits	6,469,000	2,930,000
Annual benefit-to-cost ratio	1.53	1.18
Annual return on investment	4.60%	1.38%

Source of data: GPA Feasibility Study, Section 6, Tables 6-2 and 6-3.

GPA says it believes there are "overriding and compelling reasons" (1) (for selecting the 50' Plan) and that it has "considered the costs, benefits and added value for additional depths and has concluded that the 50-foot expansion project was most consistent with its goals and objectives" (2). However, GPA has not presented a discussion of these reasons, nor has it presented a statement of its goals and objectives.

For this reason, as well as others that we understand are being raised by other parties having interests in the matter, the comment period should be extended at least 120 days and one or more public hearings should be held to give GPA an opportunity to present a detailed justification for its recommended Plan. SDI believes that the discussions of the following issues should be included in that justification.

Relationship of GPA's Plans to National Maritime Policy

In its Strategic Plan, 1998-2002, issued in April 1998, the Maritime Administration (MARAD) states that one of the challenges ahead for the industry and for MARAD is that "The transportation infrastructure must be capable of meeting increased demand, *including adequate water depths to accommodate deeper draft ships,* and providing cost-effective alternatives to relieve congestion at major ports and inland facilities. "

One of MARAD's strategic goals is Intermodalism. Under the caption "Key External Factors that May Affect Performance" (of this goal), MARAD states, "Variations in cargo flow and technological changes in the industry could affect cargo throughout and require modifications in labor and management practices. Worse, benefits that could be reaped through improvements to terminal facilities and road and rail connections are often negated by physical barriers such *as inadequate dredging on a timely basis. "*

Clearly, National Maritime Policy, as articulated by MARAD, supports harbor deepening where it can be adequately justified. However, it is not at all clear that MARAD or the Administration supports dredging every harbor to the deepest practicable depth requested by the local port authority. We recommend that GPA address the relationship of its proposed Plan to National Maritime Policy in its expanded justification.

Container Ship Design Trends

A GPA spokesperson was quoted in the Sunday 14 June issue of the *Savannah Morning News* as saying, "You never know when the next big ship is just around the corner." This statement suggests that GPA has not adequately researched shipbuilding design trends. While it is generally agreed that larger and deeper container ships will continue to be designed and built, it is not at all certain that every container ship owner will buy the largest ship available or that those that do buy larger ships will deploy them on every trade route and expect every port to accommodate them at full load draft.

The Fleet Forecast Methodologies set forth in Attachment C to the Draft Economics Appendix to the Study are purely statistical, projecting future World Fleet characteristics on the basis of what has happened in the past. GPA says, "A key assumption in the development of the Savannah fleet forecast over the study period, is that the distribution of the Savannah Fleet will approach the distribution of the world containership fleet." (3). This is not adequate, in our opinion, because it ignores the considerable technological advancements that have taken place in the shipbuilding industry in recent years, and which are continuing as the industry develops more efficient ships. Size alone does not make a ship the most efficient for a particular trade route.

Most of the world's leading shipbuilder have ceased to be mere order takers willing to build to whatever design a ship owner wants. Just as commercial aircraft companies began partnering with their customers many years ago to design and build the optimum aircraft for the intended service, the more sophisticated shipbuilders in the United States and abroad have, in recent years, begun to collaborate more closely with ship owners and shipping companies to design and build the optimum ships for the routes to be served. Even a small feeder-class container ship costs $25 million today, so shipping companies and their financiers cannot afford to make a costly mistake. Oversized and under-utilized tonnage can be a *very* costly mistake.

Many resources exist in the United States and abroad that can be accessed by GPA to provide additional insight into ship design trends, including MARAD, naval architecture firms such as M. Rosenblatt & Sons, and shipbuilders such as Alabama Shipyard in Mobile, Kvaerner in Philadelphia, Imabari in Japan and Flensburger in Germany. We recommend that GPA include such information in its expanded justification.

Changing Trade Patterns

There is a world-wide trend toward creation of hub-and-spoke facilities and routes. Hong Kong-based Hutchison Whampoa, the largest operator of private port facilities in the world, built a container transhipment facility at Freeport, Bahamas, which commenced operations in July 1997. GPA's Feasibility study does not discuss the possible impact of this and other similar facilities on trade patterns, other than to say, "It is possible that carriers may choose to handle cargo in a way that incurs double handling charges by moving through multiple ports. However this operational pattern will not change the underlying factors influencing demand for country-to-country international trade movement, *and the forecast does not capture the double handling movements* (4).

Ignoring emerging realities does a disservice to the taxpayers who are being asked to finance the expansion project. We understand that GPA does not intend to be relegated to the status of a 42' feeder port, as its spokesperson told the members of the Manufacturers Council in 15 June 1998, but we believe that the realities --- which are being supported by Maersk and other major shipping companies --- need to be addressed, not summarily dismissed. We recommend that the possible impact of Freeport on trade route patterns in

the Western Atlantic, Caribbean and Gulf of Mexico be seriously addressed in GPA's expanded justification.

Intermodal Infrastructure Considerations

Savannah, as is the case with many other U.S. ports, has inadequate infrastructure to handle the present volume of freight moving through its port facilities, much less to cope with greatly expanded volume. Savannah is fortunate that the Georgia Department of Transportation, acting through its Office of Intermodal Programs, has been studying the needed transportation infrastructure improvements in Chatham County for several years. The draft Final Report of the Chatham County Intermodal Freight Study was issued in May 1998.

The Report concludes that "Additional capacity will be needed to accommodate projected growth in waterborne commerce ... principally due to continuing growth in the movement of containerized goods, but also reflects a need for additional new bulk, break-bulk and bulk capacity." (5). It also makes the point that GPA only handles 50 % of the waterborne commerce through Chatham County, the other 50% being handled by non-GPA facilities.

We recommend that GPA's expanded economic justification discuss the relationships between GPA, the railroads, the private terminal operators and costs of providing solutions to the problems identified in the Report. Since funding for expansion and improvements to both the waterside and the landside require authorization by the Federal Government and by the State of Georgia, the total costs of these needed improvements should be discussed with the public.

Draft Environmental Impact Statement

SDI has no comments at this time concerning the Draft Environmental Impact Statement (DEIS) prepared by the US Army Corps of Engineers, Savannah District (COE), which appears to adequately address the environmental impacts and plans for mitigation for each of the scenarios in the Study.

(1) Study, Section 1, Page 10.
(2) Study, Section 6, Page 13.
(3) Study, Economics Appendix Page 1.
(4) Study, Economics Appendix, Section 3, Page 6.
(5) Chatham County Intermodal Freight Study, Draft Final Report, Page 1-4.

Synergistic Dynamics, Inc.

Letter response

SYNERGISTIC DYNAMICS, INC.
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16 June 1998

1. COMMENT: Our primary concern is that GPA has not made a case for its proposed 50' Plan, the most expensive and least cost-effective of the five depth scenarios studied in the subject Feasibility Study report. The 50' Plan is projected to cost $211,270,000, including construction interest. That is over 50% --- $72 million in current year dollars --- more than the projected cost of the 47' National Economic Development (NED) Plan. Considering the very substantial cost differential, GPA has a duty to make a compelling case for recommending the 50' Plan; it has not done so in the subject Feasibility Study report.

RESPONSE: The Economic Appendix has been revised to support a NED and Recommended plan selection of a -48 foot project depth. GPA concurs with this selection and has selected the -48 foot project depth as the Locally Preferred Plan.

2. COMMENT: In order to give GPA sufficient time to make its case for the 50' Plan and to address other issues and concerns that are being raised by other parties having interests in the future well being of the Port of Savannah, we strongly recommend that the comment period be extended by at least 120 days and that two public hearings be held during that time period, one to address only the economic justification, the other to address all other concerns. We believe that two hearings would result in a more orderly process.

RESPONSE: The Public Comment Period was extended by 15 days to 7 July 1998. GPA has been meeting with individual groups and agencies during the Public Comment period, and plans to hold public information meetings and hearings during the CED phase as part of the preparation of the Tier II EIS.

3. COMMENT: Recommended Plan not Economically Justified. We find the economic justification for the 47' scenario, the National Economic Development (NED) Plan, to be compelling, but GPA failed, in our opinion, to adequately justify its selection of the 50' scenario as the Locally Preferred Plan / Recommended Plan rather than the NED Plan. GPA says it believes there are "overriding and compelling reasons"(1) for

selecting the 50' Plan and that it has "considered the costs, benefits and added value for additional depths ... and has concluded that the 50-foot expansion project was most consistent with its goals and objectives"(2). However, GPA has not presented a discussion of these reasons, nor has it presented a statement of its goals and objectives.

RESPONSE: The Economic Appendix has been revised to support a NED and Recommended plan selection of a -48 foot project depth. GPA concurs with this selection and has selected the -48 foot project depth as the Locally Preferred Plan.

4. COMMENT: Relationship of GPA's Plans to National Maritime Policy. In its Strategic Plan, 1998-2002, issued in April 1998, MARAD states that one of the challenges ahead for the industry and for MARAD is that "The transportation infrastructure must be capable of meeting increased demand, *including adequate water depths to accommodate deeper draft ships*, and providing cost-effective alternatives to relieve congestion at major ports and inland facilities." Clearly, National Maritime Policy, as articulated by MARAD, supports harbor deepening where it can be adequately justified. However, it is not at all clear that MARAD or the Administration supports dredging every harbor to the deepest practicable depth requested by the local port authority. We recommend that GPA address the relationship of its proposed Plan to National Maritime Policy in its expanded justification.

RESPONSE: The economic evaluation followed established Federal Guidelines and adequately addressed the economic justification for the project.

5. COMMENT: Container Ship Design Trends The Fleet Forecast Methodologies set forth in Attachment C to the Draft Economics Appendix to the Study are purely statistical, projecting future World Fleet characteristics on the basis of what has happened in the past. GPA says, "A key assumption in the development of the Savannah fleet forecast over the study period, is that the distribution of the Savannah Fleet will approach the distribution of the world containership fleet." This is not adequate, in our opinion, because it ignores the considerable technological advancements that have taken place in the shipbuilding industry in recent years, and which are continuing as the industry develops more efficient ships. Size alone does not make a ship the most efficient for a particular trade route. Many resources exist in the United States and abroad that can be accessed by GPA to provide additional insight into ship design trends, including MARAD, naval architecture firms such as M. Rosenblatt & Sons, and shipbuilders such as Alabama Shipyard in Mobile, Kvaerner in Philadelphia, Imabari in Japan and Flensburger in Germany. We recommend that GPA include such information in its expanded justification.

RESPONSE: The fleet forecast was completed in accordance with USACOE National Economic Development Deep Draft Navigation Project guidelines. Calculations took into considerations the changing nature of the containership fleet and orderbook over the past 30 years – with specific emphasis on current and planned changes in the containership fleet during the 1990s, including the construction and operation of Post-Panamax II class vessels. The forecast results are consistent with current and future plans for vessel deployments by carriers serving Savannah and partner ports both in the U.S. and abroad. The forecast results

are also consistent with forecasts developed by other U.S. ports. Lastly, the forecasts took into account the latest reasonable ship designs documented in public literature. This included examination of the impact of 8000 TEUs vessels advertised by European shipyards.

6. COMMENT: Changing Trade Patterns. There is a world-wide trend toward creation of hub-and-spoke facilities and routes. Hong Kong-based Hutchison Whampoa, the largest operator of private port facilities in the world, built a container transhipment facility at Freeport, Bahamas, which commenced operations in July 1997. GPA's Feasibility study does not discuss the possible impact of this and other similar facilities on trade patterns, other than to say, "It is possible that carriers may choose to handle cargo in a way that incurs double handling charges by moving through multiple ports." However this operational pattern will not change the underlying factors influencing demand for country-to-country international trade movement, and the forecast does not capture the double handling movements. Ignoring emerging realities does a disservice to the taxpayers who are being asked to finance the expansion project. We believe that the realities --- which are being supported by Maersk and other major shipping companies --- need to be addressed, not summarily dismissed. We recommend that the possible impact of Freeport on trade route patterns in the Western Atlantic, Caribbean and Gulf of Mexico be seriously addressed in GPA's expanded justification.

RESPONSE: Vessel operational patterns, such as hub-and-spoke distribution systems, will not impact demand for country-to-country international trade movements. Hub-and-spoke distribution ports that carriers currently or potentially plan to operate in the Western Hemisphere and Europe primarily function as cargo transshipment connectors between carrier services offered on east-west trade routes and north-south trade routes. Caribbean based transshipment hubs, such as Freeport Bahamas, which are in close proximity of the U.S. are not expected to support the movement of large quantities of U.S. originating/destined cargoes from major trades due to two additional cargo handling fees which would be required of containers loaded/off-loaded at the transshipment port. In the case of U.S. originating/destined cargo on vessels calling transhipment ports, it is assumed that these vessels will make direct vessel calls to U.S. ports to load/off-load these cargoes. Transshipment cargoes currently make up a small portion of the cargoes moving through the Port of Savannah and other U.S. ports even though a number of Caribbean based transshipment ports have existed since the 1980s.

7. COMMENT: Intermodal Infrastructure Considerations. Savannah, as is the case with many other U.S. ports, has inadequate infrastructure to handle the present volume of freight moving through its port facilities, much less to cope with greatly expanded volume.

RESPONSE: An evaluation of the theoretical capacity of the Port of Savannah and several other ports in the U.S. was completed. Results of this analysis show that most ports have sufficient capacity to handle current and near term growth in cargo volumes. In the case of Savannah, the analysis identified that the Port's current annual capacity exceeded 1.0 million TEUs with only minor changes in infrastructure or operational practices. Importantly, a major assumption in the economic analysis is that over the study period, ports

will maintain sufficient capacity to support future increases in cargo volumes from current levels. This assumption considers that port authorities will make periodic investments in port infrastructure (berths, cranes, storage acreage, etc.), private and public sector investment will insure adequate landside access (e.g.; roads / highways and railways) to support cargo movement to / from the port, and that the port will benefit from technological and productivity improvements in operations.

8. COMMENT: We recommend that GPA's expanded economic justification discuss the relationships between GPA, the railroads, the private terminal operators and costs of providing solutions to the problems identified in the Report. Since funding for expansion and improvements to both the waterside and the landside require authorization by the Federal Government and by the State of Georgia, the total costs of these needed improvements should be discussed with the public.

RESPONSE: The costs of future infrastructure needs is not required in the economic analysis; the economic justification for the project does not require an evaluation of infrastructure costs.

9. COMMENT: The DEIS appears to adequately address the environmental impacts and plans for mitigation for each of the scenarios in the study.

RESPONSE: No response necessary.

Tybee Island Task Force (Professor Christopher Schuberth)

Tybee Island Beach Erosion Task Force

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Wednesday, 27 May 1998

Mr. William Bailey
Environmental Resources Branch
Army Corps of Engineers
P.0. Box 889
Savannah, GA 31402

RE: DEIS Savannah Harbor Expansion

Dear Mr. Bailey,

I have examined a copy of the referenced, document with a letter from Mr. Myron Yuschishin suggesting that questions I might have should be directed to you.

Two concerns come to mind both of which relate to comments under Section 5.8.1.1 (Sand Sources) on page 58.

You say in that paragraph: "Beach erosion has many causes, including tide currents, wave effects, sea level fluctuation, and storm action. Offsetting this loss of material is the deposition of sand carried by littoral drift. A common belief is that the presence of a navigation channel intercepts this transportation mechanism and retains this sand. In the Savannah region, the direction of net littoral transport along the shoreline is generally to the south. Historic data of dredge material composition indicate the majority is not beach quality sand. Therefore, the proposal is not expected to incrementally change the present littoral drift system in the region."

Quite frankly, the sentences in the paragraph do not relate to each other (non sequitur). The sentence reads: A common belief is that the presence of a navigation channel intercepts... The sentence is not supported by a confirming statement as to why the concept is a myth. Yet, I can reference two publications that strongly implicates the presence of the deepened navigation channel to adversely impact the downdrift region that includes Tybee Island. These publications are: George Oertel (1977) Outline for Letter response: For Determining Criteria for Evaluating the Relationship between Channel Improvements and Tybee Erosion and Jim Henry (1984) Recommendations for Long-Term Mitigation of Beach Erosion on Tybee Island, Georgia. I do not think one should be so quick to say that "common belief" is just common and implied to be unsupported and just a belief that is not founded on any scientific credibility.

Secondly, I would like to see the hard supporting facts to support your statement that: Historic data of dredge material composition indicate the majority is not beach quality sand. Following that sentence, you then quickly dismiss the problem by stating: Therefore, the proposed project is not expected to incrementally change the present littoral drift system in the region. an inference that does not follow from the premise. Of course the proposed project will not change the present littoral drift system incrementally or otherwise. It is the sand-sharing system that will be impacted. And that impact the harbor deepening has on the sand-sharing system you fail to address.

Thank you for taking the time to respond.

Sincerely,

Christopher J. Schuberth,
Professor of Geology and Chair
Tybee Island Beach Erosion Task Force

cc: The City of Tybee Island

Letter response

Professor Christopher J. Schuberth
Chair of the Tybee Island Beach Erosion Task Force
Armstrong Atlantic State University
11935 Abercorn Street
Savannah, Georgia 31419-1997

DATE: May 27, 1998

1. COMMENT: The DEIS states in Section 5.8.1.1 that "A common belief is that the presence of a navigation channel intercepts this transportation mechanism and retains this sand." The sentence is not supported by a confirming statement as to why the concept is unsupported and not founded on any scientific credibility.

RESPONSE: This section has been revised to better support the position that the Savannah Harbor entrance channel does not retain all sand transported across it by the littoral drift.

2. COMMENT: I would like to see the hard supporting facts to support your statement that: "Historic data of dredge material composition indicate the majority is not beach quality sand."

RESPONSE: This information has been included in Section 5.8.1.1 of the DEIS..

3. COMMENT: The study documents fail to address the project's impacts on the sand-sharing system.

RESPONSE: Section 5.8.1 has been expanded to better address this issue.

UNION CAMP CORPORATION

P.O. BOX 570, SAVANNAH, GA. 31402 TELEPHONE (912) 238-6000

July 7, 1998

Department of the Army
Savannah District, Corps of Engineers
Planning Division
P.O. Box 889
100 W. Oglethorpe Ave.
Savannah, Georgia 31402-0889

Attention: Mr. William Bailey

Re: Comments on Draft Feasibility Report and Draft Environmental Impact Statement: Proposed Savannah River Expansion and Deepening Project

To Whom it May Concern:

Union Camp Corporation ("UCC"), submits the following comments on the Draft Feasibility Report and Draft Environmental Impact Statement ("DEIS") for the Savannah River expansion and deepening proposal ("Project"). These comments are submitted within forty-five (45) days of the Joint Public Notice dated May 8, 1998 and the fifteen (15) days extension granted on June 22, 1998.

At the outset we wish to stress that UCC supports the harbor deepening project; provided that the Corps ensures the integrity of the Harbor is protected and that the other users of this resource are not left with the responsibility of mitigating impacts that this project may have on the Savannah River. To that end, we have the following comments on the Draft Feasibility Report and DEIS prepared by the Corps and the Georgia Ports Authority ("GPA"):

UCC adopts and incorporates by this reference the joint comments signed by members of the Savannah Harbor Committee of the Savannah Manufacturer's Council dated July 7, 1998 duly submitted in response to this DEIS.

A summary of the joint comments is as follows.

The model utilized to predict the salinity and oxygen demand contains numerous deficiencies which call into question the accuracy of the predictions.

The DEIS predicts that the project will decrease dissolved oxygen in the River by as much as 1 mg/L. It also predicts that it will increase salinity levels in the harbor area and upstream at public water treatment intakes and adjacent to fish hatcheries. The Army Corps of Engineers ("Corps") and Georgia Ports Authority ("GPA") do not offer any mitigation plans to offset this predicted degradation. This does not comply with the requirements of the National Environmental Policy Act (NEPA), 42 U.S.C. Para 4321 et seq. and its implementing regulations, 40 C.F.R. Para 1500 et seq. (1997).

The Hydrodynamic and Water Quality Model predicts lower concentrations of DO in affected areas of the Savannah River to concentrations below those permissible under Georgia law. In addition, the Project's reduction of DO concentrations violates anti-degradation principles central to Georgia's, South Carolina's, and federal regulatory schemes designed to protect water quality. Finally, the Project is not in accordance with law for purposes of the Administrative Procedures Act ("APA"), 5 U.S.C. Para 706(2) (1996).

In addition, UCC hereby submits additional comments, a summary of which is as follows:

The DEIS admits that the project will require the taking of private property for a channel widener. The DEIS admits that it has not performed a ship simulator study to assure that the planned widener is sufficient for a 1044 foot long vessel. This does not comply with NEPA, 42 U.S.C. Para 4332.

PRIVATE PROPERTY CONCERNS

UCC owns property on the north side of the Savannah River from approximately Corps Annual River Survey Station ("Station") 85+000 to 93+000. Critical operations on this property consist of a 100 acre waste water lagoon and NPDES outfall that extend from about Station 87+000 to 92+000, and a solids handling area that extends from Station 85+000 to 87+000. In the past five years, UCC has spent over $500,000 in slope stabilization activities (revetment) along the Savannah River from Station 88+470 to 91+780. In addition, in 1994, GPA performed revetment of the slope from channel marker 87+400 to 88+050. In addition, UCC owns and operates the largest Kraft pulp and paper mill in the world on the south bank of the Savannah River in this same area. Utilities located under the river link UCC operations on Hutchinson Island to its main complex on the south side of the river. Therefore, UCC is vitally interested in any channel deepening activity that could impact its infrastructure, decrease river bank stability, increase river bank erosion, or result in the need for UCC to purchase additional property or obtain easements in the area.

Ship Simulation Study

Several sections of the Feasibility Study (e.g., Engineering Appendix, sections 5.1.2 and 5.4.1) indicate that a ship simulator study is normally conducted during the project feasibility phase. However, because of the schedule of the submission of the final Feasibility Report, the Corps decided to conduct a ship simulator study during the engineering and design phase (CED). As referenced in the Feasibility Report, the engineering manual recommends that "the . . . design channel width for navigation projects with maximum currents greater than 3.0 knots should be developed with the assistance of a ship simulator study." (Engineering Appendix, section 5.4.1) The Feasibility Report and other documents state that velocities in excess of 3.0 knots have been measured in the Savannah River. For the Feasibility Study, the channel alignment was evaluated using design experience and input from harbor and docking pilots. However, the design experience was based on a vessel for the last deepening project which has an overall length of 961 feet, a beam of 106 feet and a draft of 39.9 feet. On the other hand, the design vessel for the Project is a ship which is 1,044 feet long with a beam of 140 feet and a design draft of 46 feet. The Feasibility Report further states that the harbor and docking pilots and a representative of the Coast Guard expressed concern about narrowing the bottom width to accommodate a wider design vessel. (Engineering Appendix, section 5.4) They only appeared to concur with the recommended alignment based on the fact that a ship simulator would be performed in the CED-

UCC is concerned that a ship simulator study was not performed during the feasibility stage. The Engineering Appendix indicates that a portion of UCC property on Hutchinson Island is required for a channel widener. The Feasibility Study and DEIS do not discuss just compensation to UCC for such a taking. In any event, until the GPA and the Corps perform a ship simulator, the exact channel widening requirements will remain unknown and UCC cannot fully assess the Project's impact on UCC's property and operations. Therefore, UCC requests that GPA and the Corps perform a ship simulator study and incorporate it into a Supplementary DEIS.

Channel Widener

The Engineering Appendix (section 5.4, Tables 5-6, Figures 3, 4 and 34) indicates that a Channel Widener will be required between Station 85+000 and 88+500, which is property currently owned by UCC. This property is in the vicinity of UCC's wastewater lagoon. UCC is vitally interested in ensuring that harbor activities do not affect the integrity of the bank and the berms of its 100-acre wastewater lagoon. The land targeted to be removed as part of channel widening is a "point." Removal of such property could alter the wave patterns and river flow in this area. River bank areas above and below the channel widener could be affected. UCC recently has spent a significant amount of money stabilizing these areas to prevent further erosion. Additional study is needed to assure that the structural integrity of UCC's dikes will not be affected by the dredging activities.

Land Acquisition for Channel Widener

The Real Estate Appendix (e.g., section 2.1.2) indicates that a Channel Improvement/Sloughing Easement or Special Use Permit will be required for the land above mean high water required for channel widening between Station 85+000 and 88+500. The real estate estimate of the project documents for a 18.38-acre channel improvement/sloughing easement, of which a portion is UCC's property between Station 85+000 and 88+500, is $587,000. Without further details, UCC cannot determine if this amount constitutes adequate or just compensation for its property. In addition, the table in the Real Estate Estimate section of the project documents indicates that no money has been estimated for improvements or damages in the area of land acquisition. UCC has expensive revetments in this area that, at a minimum, would require replacement and provisions for assuring that the same structural integrity to the revetment system is restored. Furthermore, the revetments may require expansion, based on the potential for erosion after the completion of the Project. However, this information was not provided in the Feasibility Study or DEIS. The Corps and GPA's failure to consider this impact of the Project constitutes a violation of NEPA, 42 U.S.C. Para 4332(c). The Corps and GPA must develop a plan to restore shorelines and the revetment system to the original condition and to mitigate any new areas of erosion caused by the Project.

Utility Crossings and Obstructions

The Engineering Appendix (Channel Stations 59+000 - 58+500, section 6.3) indicates that there is one 42" diameter effluent pipe and one 6" diameter electrical conduit located at approximately Station 91+745. According to section 6.3 of the Engineering Appendix, these pipes transfer effluent from UCC's mill on the south side of the channel to the mill effluent lagoons on the north side of the river. In addition, the pipes provide electrical power to the lagoons. The Engineering Appendix correctly states that the utilities will not be disturbed by the Project. However, the location of the utilities is incorrect. The first sentence of the second paragraph of section 6.3 should be replaced with the following: "One 42" diameter effluent pipe and one 6" diameter electrical conduit are located at approximately Station 89+250. There is a 48" effluent outfall line at Station 91+979..."

REQUESTED ACTION REGARDING PRIVATE PROPERTY CONCERNS

UCC respectfully requests that the Corps incorporate a commitment in the Final EIS to prepare a Supplemental DEIS to address the issues relating to the channel widener as outlined in this letter.

CONCLUSION

UCC supports the Corps' efforts to ensure that the Savannah Harbor remains a viable commercial port of call both now and in the future. However, the comments presented in this letter and, by reference, the Harbor Committee's letter raise substantial questions about the environmental and economic impact of the Project. Therefore, in addition to the above requested action, UCC requests the Corps and GPA incorporate in the Final DEIS mitigation measures in regard to DO and chlorides as well as the other action items presented in the Harbor Committee comments.

We look forward to receiving your responses to these comments.

Respectfully yours,

Willis J. Potts, Jr.
Sr. Vice President, Kraft Paper & Board Division

cc: Laird R. Jones, Esq.
Mr. Jim Baker
Joel C. Williams, Jr., Esq.

Letter response

UNION CAMP CORPORATION
P.O. BOX 570
SAVANNAH, GA. 31402

July 7, 1998

1. COMMENT: UCC supports the harbor deepening project; provided that the Corps ensures the integrity of the Harbor is protected and the other users of this resource are not left with the responsibility of mitigating impacts that this project may have on the Savannah River.

RESPONSE: The proposed project was designed to avoid impacts where possible, includes features to avoid other impacts, and will compensate for those impacts for which it is legally required to mitigate.

2. COMMENT: UCC adopts and incorporates by this reference the joint comments signed by members of the Savannah Harbor Committee of the Savannah Manufacturer's Council dated July 7, 1998 duly submitted in response to this DEIS. A summary of the joint comments is as follows.

A) The model used to predict the salinity and oxygen demand contains numerous deficiencies that call into question the accuracy of the predictions.

B) The DEIS predicts that the project will decrease D.O. in the river by as much as 1 mg/L. It also predicts that it will increase salinity levels in the harbor area and upstream at public water treatment intakes and adjacent to fish hatcheries. The Corps and GPA do not offer any mitigation plans to offset this predicted degradation. This does not comply with the requirements of the NEPA, 42 U.S.C. Para 4321 et seq. and its implementing regulations, 40 C.F.R. Para 1500 et seq. (1997).

C) The Hydrodynamic and Water Quality Model predicts lower concentrations of D.O. in affected areas of the Savannah River to concentrations below those permissible under Georgia law. In addition, the Project's reduction of D.O. concentrations violates anti-degradation principles central to Georgia's, South Carolina's, and federal regulatory schemes designed to protect water quality.

D) Finally, the Project is not in accordance with law for purposes of the APA, 5 U.S.C. Para 706(2) (1996).

RESPONSE: (A) Review of the Salinity and Dissolved Oxygen Model has been done by experts representing the United States Fish and Wildlife Unit (Salinity), the Environmental Protection Agency (Salinity and Dissolved Oxygen), as well as James Martin of ASCI for the local industries and the Chamber of Commerce (Salinity and Dissolved Oxygen). The United States Fish and Wildlife representative has agreed that the salinity model as presented in the EIS is sufficient for evaluating the project impacts. The EPA representative has identified that both the salinity and dissolved oxygen model is sufficient for evaluating the project impacts. James Martin in a meeting identified that the salinity model as applied is sufficient for evaluating the project impacts. He also agreed that the model is an appropriate tool for evaluating the impacts to dissolved oxygen but he feels that certain simplifying assumptions in the application of the model are not sufficient. Additional refinements to the dissolved oxygen model are to be completed within the CED phase and will be reported within the Tier II EIS to be completed during the CED phase. Additionally measurements made in the Summer of 1997 identify that the system at present violates the state standard of a dissolved oxygen concentration not less than 3.0 mg/L at any time.

(B) A plan of study has been proposed and presented to the City of Savannah to quantify any increases in the chloride concentration at their raw water intake due to the proposed deepening project. This Plan of Study is presently under review by the City of Savannah. This study is to be implemented during the CED phase of the project and the results of this study will be presented in the Tier II EIS and a separate stand alone report. This work will be completed during the CED phase of the project. If the study identifies increases in the Chloride Concentrations at the City of Savannah Intake due to the proposed project, mitigative action will be taken. The $46 million dollar cost proposed by the City of Savannah to mitigate for increases in chloride concentrations at their intake has been factored into the project. In addition, the Corps and GPA will mitigate for any dissolved oxygen impacts to the system by returning the dissolved oxygen to pre-project levels.

(C) In order for the project to proceed a 401 certification will need to be issued which evaluates the project impacts upon the water quality regulations of the State of Georgia. In addition, the project will mitigate for any changes in DO caused by the deepening.

(D) The EIS adequately addresses all regulatory requirements of the project.

3. COMMENT: The DEIS admits that the project will require the taking of private property for a channel widener. The DEIS admits that it has not performed a ship simulator study to assure that the planned widener is sufficient for a 1044 foot long vessel. This does not comply with NEPA, 42 U.S.C. Para 4332.

RESPONSE: The real estate requirements are based on the preliminary channel design. Further studies in the CED phase will be used to finalize the design.

4. COMMENT: PRIVATE PROPERTY CONCERNS -- UCC owns property on the north side of the Savannah River from approximately Station 85+000 to 93+000. Critical operations on this property consist of a 100 acre waste water lagoon and NPDES outfall that extend from about Station 87+000 to 92+000, and a solids handling area that extends from Station 85+000 to 87+000. UCC recently spent over $500,000 in slope stabilization activities (revetment) along the river from Station 88+470 to 91+780. In addition, in 1994, GPA performed revetment of the slope from channel marker 87+400 to 88+050. In addition, UCC owns and operates the largest Kraft pulp and paper mill in the world on the south bank of the Savannah River in this same area. Utilities located under the river link UCC operations on Hutchinson Island to its main complex on the south side of the river. Therefore, UCC is vitally interested in any channel deepening activity that could impact its infrastructure, decrease river bank stability, increase river bank erosion, or result in the need for UCC to purchase additional property or obtain easements in the area.

RESPONSE: The value for the land acquisition will include any improvements. The value of the revetment will be part of the just compensation for the taking of land. It will be the land owners' responsibility to replace the revetment from the land payments made to the land owners. A Ship Simulation Study will be performed during the CED phase to finalize the channel design. The acquisition of lands will be based on the final channel.

5. COMMENT: Ship Simulation Study -- Several sections of the Feasibility Study (e.g., Engineering Appendix, sections 5.1.2 and 5.4.1) indicate that a ship simulator study is normally conducted during the project feasibility phase. However, because of the schedule of the submission of the final Feasibility Report, the Corps decided to conduct a ship simulator study during the engineering and design phase (CED). As referenced in the Feasibility Report, the engineering manual recommends that "the . . . design channel width for navigation projects with maximum currents greater than 3.0 knots should be developed with the assistance of a ship simulator study." (Engineering Appendix, section 5.4.1) The Feasibility Report and other documents state that velocities in excess of 3.0 knots have been measured in the Savannah River. For the Feasibility Study, the channel alignment was evaluated using design experience and input from harbor and docking pilots. However, the design experience was based on a vessel for the last deepening project which has an overall length of 961 feet, a beam of 106 feet and a draft of 39.9 feet. On the other hand, the design vessel for the Project is a ship which is 1,044 feet long with a beam of 140 feet and a design draft of 46 feet. The Feasibility Report further states that the harbor and docking pilots and a representative of the Coast Guard expressed concern about narrowing the bottom width to accommodate a wider design vessel. (Engineering Appendix, section 5.4) They only appeared to concur with the recommended alignment based on the fact that a ship simulator would be performed in the CED phase.

RESPONSE: The best available engineering information was used to identify the need for and lay out the channel wideners. This was supplemented with information provided by experienced pilots and designers from WES. The feasibility study is not intended to be based on complete final designs and will be refined in the next project phase. Changes to the channel and its impacts on the environment, real estate, construction

schedule, and future maintenance activities will be documented as part of the next phase of the project.

6. COMMENT: UCC is concerned that a ship simulator study was not performed during the feasibility stage. The Engineering Appendix indicates that a portion of UCC property on Hutchinson Island is required for a channel widener. The Feasibility Study and DEIS do not discuss just compensation to UCC for such a taking. In any event, until the GPA and the Corps perform a ship simulator, the exact channel widening requirements will remain unknown and UCC cannot fully assess the Project's impact on UCC's property and operations. Therefore, UCC requests that GPA and the Corps perform a ship simulator study and incorporate it into a Supplementary DEIS.

RESPONSE: The value for the land acquisition will include any improvements. The value of the revetment will be part of the just compensation for the taking of land. It will be the land owners' responsibility to replace the revetment from the land payments made to the land owners. A Ship Simulation Study will be performed during the CED phase to finalize the channel design. The acquisition of lands will be based on the final channel.

7. COMMENT: Channel Widener -- The Engineering Appendix (section 5.4, Tables 5-6, Figures 3, 4 and 34) indicates that a Channel Widener will be required between Station 85+000 and 88+500, which is property currently owned by UCC. This property is in the vicinity of UCC's wastewater lagoon. UCC is vitally interested in ensuring that harbor activities do not affect the integrity of the bank and the berms of its 100-acre wastewater lagoon. The land targeted to be removed as part of channel widening is a "point." Removal of such property could alter the wave patterns and river flow in this area. River bank areas above and below the channel widener could be affected. UCC recently has spent a significant amount of money stabilizing these areas to prevent further erosion. Additional study is needed to assure that the structural integrity of UCC's dikes will not be affected by the dredging activities.

RESPONSE: The stability of the Union Camp Dikes will be evaluated upon the completion of the Ship Simulation Study and Final Channel Alignment.

8. COMMENT: Land Acquisition for Channel Widener -- The Real Estate Appendix (e.g., section 2.1.2) indicates that a Channel Improvement/Sloughing Easement or Special Use Permit will be required for the land above mean high water required for channel widening between Station 85+000 and 88+500. The real estate estimate of the project documents for a 18.38-acre channel improvement/sloughing easement, of which a portion is UCC's property between Station 85+000 and 88+500, is $587,000. Without further details, UCC cannot determine if this amount constitutes adequate or just compensation for its property. In addition, the table in the Real Estate Estimate section of the project documents indicates that no money has been estimated for improvements or damages in the area of land acquisition. UCC has expensive revetments in this area that, at a minimum, would require replacement and provisions for assuring that the same structural integrity to the revetment

system is restored. Furthermore, the revetments may require expansion, based on the potential for erosion after the completion of the Project. However, this information was not provided in the Feasibility Study or DEIS. The Corps and GPA's failure to consider this impact of the Project constitutes a violation of NEPA, 42 U.S.C. Para 4332(c). The Corps and GPA must develop a plan to restore shorelines and the revetment system to the original condition and to mitigate any new areas of erosion caused by the Project.

RESPONSE: The value for the land acquisition will include any improvements. The value of the revetment will be part of the just compensation for the taking of land. It will be the land owners' responsibility to replace the revetment from the land payments made to the land owners. A Ship Simulation Study will be performed during the CED phase to finalize the channel design. The acquisition of lands will be based on the final channel.

9. COMMENT: Utility Crossings and Obstructions -- The Engineering Appendix (Channel Stations 59+000 - 58+500, section 6.3) indicates that there is one 42" diameter effluent pipe and one 6" diameter electrical conduit located at approximately Station 91+745. According to section 6.3 of the Engineering Appendix, these pipes transfer effluent from UCC's mill on the south side of the channel to the mill effluent lagoons on the north side of the river. In addition, the pipes provide electrical power to the lagoons. The Engineering Appendix correctly states that the utilities will not be disturbed by the Project. However, the location of the utilities is incorrect. The first sentence of the second paragraph of section 6.3 should be replaced with the following: "One 42" diameter effluent pipe and one 6" diameter electrical conduit are located at approximately Station 89+250. There is a 48" effluent outfall line at Station 91+979..."

RESPONSE: The quoted section of the Engineering Appendix will be revised as requested.

10. COMMENT: REQUESTED ACTION REGARDING PRIVATE PROPERTY CONCERNS --UCC respectfully requests that the Corps incorporate a commitment in the Final EIS to prepare a Tier II DEIS to address the issues relating to the channel widener as outlined in this letter.

RESPONSE: A Tier II EIS would be prepared if, after project approvals are obtained, design changes indicate that substantially different or additional environmental impacts would occur from project implementation. If CED studies indicate that substantially different or substantial additional acreage of land would be needed, then a Tier II EIS may be needed.

11. COMMENT: CONCLUSION -- UCC supports the Corps' efforts to ensure that the harbor remain a viable commercial port of call both now and in the future. However, the comments presented in this letter and, by reference, the Harbor Committee's letter raise substantial questions about the environmental and economic impact of the Project. Therefore, in addition to the above requested action, UCC requests the Corps and GPA

incorporate in the Final DEIS mitigation measures in regard to D.O. and chlorides as well as the other action items presented in the Harbor Committee comments.

RESPONSE: The EIS will be revised to provide mitigation of project impacts on chloride levels at the City's water intake and dissolved oxygen levels in the Savannah Harbor. The estimated costs of mitigation have been included in the project costs.

UNITED ARAB AGENCIES
511 South Ave. / Cranford, New Jersey 07016
Phone 908-272-0050 / FAX 908-272-9221

June 24, 1998

Mr. William Bailey
U.S. Army Corps of Engineers
Planning Division
Environmental Research Branch
P.O. Box 889
100 W. Oglethorpe Avenue
Savannah, GA 31402

Dear Mr. Bailey.

RE: SAVANNAH HARBOR DEEPENING FEASIBILITY STUDY

United Arab Shipping Company is the national shipping line of six Arab Gulf countries and has been a consistent user of the Port of Savannah for the past two decades. Presently, we serve the Port through our partnership in the United Alliance that encompasses Hanjin, DSR-Senator and Cho Yang.

The Port of Savannah has for the past decade been UASC's largest East Coast load port and we have had a very rewarding and mutually beneficial relationship with the Georgia Ports Authority.

Our service (America-MED-Asia) calls in Savannah on a weekly basis. Prior to Savannah, we have vessel calls in New York (Newark) and Norfolk. Down the road, we would like to call only at two ports and if the Jones Act is amended or rescinded to allow foreign flag feeders, we may even consider calling only a single East Coast port.

We sincerely hope that Savannah will place itself as a competitive port should the load center concept come into fruition. We realize that other competing ports are thinking along the same lines. Although., we do not think that one or two ports could cater to all the needs of the carriers, we believe that most mega carriers / carrier partnerships will confine themselves to not more than two ports of call. We hope that Savannah will be one of them. To achieve this goal, we believe that the Port of Savannah should look into the following improvements:

i. Extending the current 42' MLW draft to at least 48' MLW to accommodate a new generation of container vessels or existing vessels arriving with a heavier load factor and consequently a deeper draft.

ii. Whilst deepening the Savannah River navigational channel stands out on the top of list, this is not the singular criteria that will take the Port to the next level. Although some of our recommendations would be outside that scope of your study, we hope you would allow us the liberty to highlight some of these factors:

a) We believe that the terminal facilities should be expanded to allow a number of feeder vessels to be accommodated and the yard capabilities enhanced to allow the smooth flow of containers between mainline and feeder vessels.

b) The hinterland connections to the Port should also be developed to cope with the increase in volume and some of these programs could possibly be incorporated within the Federal Government's ISTEA program. Rail connections to the Gulf and other East Coast regions should be expanded and we hope that the further consolidation of rail carriers will not be an inhibiting factor.

c) Carriers seeking to make Savannah a load center will be looking to expand their work force in areas within proximity to the Port. There is a shortage of office space and trained manpower in the area and with some forward planning these could be overcome.

In short, deepening the Savannah River channel is a necessary first step but the authorities must look at the total package because some of your competing ports have advantages that Savannah currently does not posses.

If the Port of Savannah is not elevated to the next level, the Port runs the risk not only of losing out on growth prospects but even losing some of your existing business. UASC as a mid-size carrier is also faced with the same type of dilemma, i.e. if we remain a niche operator without seeking expansion, this would be an uphill battle in a deregulated environment. We could therefore relate to the challenges ahead and we believe with sound planning and foresight both UASC and the Port Savannah could grow together in the years ahead.

Sincerely yours,

UNITED ARAB AGENCIES, INC.

Dr. Anil J. Vitharana
Acting President

AJV / me
REF.: UAAI-336-98

The Honorable Senator Paul Coverdell
2 East Bryan Street
Savannah GA 31401

The Honorable Senator Max Cleland
75 Spring Street SW
Atlanta, GA 30303

The Honorable Representative Jack Kingston, First District
6605 Abercorn Street, Suite 102
Savannah, GA 31406

The Honorable Governor Zell Miller
Governor of Georgia
203 State Capitol
Atlanta, GA 30334

The Honorable Mayor Floyd Adams, Jr.
City Hall
P.O. Box 1027
Savannah, GA 31402

Letter response

UNITED ARAB AGENCIES

511 South Ave. / Cranford, New Jersey 07016
Phone 908-272-0050 / FAX 908-272-9221

June 24, 1998

1. COMMENT: The Port of Savannah has for the past decade been UASC's largest East Coast load port and we have had a very rewarding and mutually beneficial relationship with GPA. Our service (America-MED-Asia) calls in Savannah on a weekly basis. Prior to Savannah, we have vessel calls in New York (Newark) and Norfolk. Down the road, we would like to call only at two ports and if the Jones Act is amended or rescinded to allow foreign flag feeders, we may even consider calling only a single East Coast port.

RESPONSE: The goals stated by UASC reflect those trends which GPA's economic consultant found in their analysis of the shipping industry.

2. COMMENT: We believe that most mega carriers/carrier partnerships will confine themselves to not more than two ports of call. We hope that Savannah will be one of them. To achieve this goal, we believe that the Port of Savannah should look into the following improvements:

RESPONSE: No response necessary.

3. COMMENT: (i) Extending the current 42' MLW draft to at least 48' MLW to accommodate a new generation of container vessels or existing vessels arriving with a heavier load factor and consequently a deeper draft.

RESPONSE: No response necessary.

4. COMMENT: (ii) Whilst deepening the Savannah River navigational channel stands out on the top of list, this is not the singular criteria that will take the Port to the next level. Although some of our recommendations would be outside that scope of your study, we hope you would allow us the liberty to highlight some of these factors:

a) Expansion of the terminal facilities to allow a number of feeder vessels to be accommodated and the yard capabilities enhanced to allow the smooth flow of containers between mainline and feeder vessels.

b) Further development of the hinterland connections to the Port to cope with the increase in volume. Rail connections to the Gulf and other East Coast regions should be

expanded and we hope that the further consolidation of rail carriers will not be an inhibiting factor.

c) Carriers seeking to make Savannah a load center will be looking to expand their work force in areas within proximity to the Port. There is a shortage of office space and trained manpower in the area and with some forward planning these could be overcome.

RESPONSE: No response necessary.

5. COMMENT: Deepening the Savannah River channel is a necessary first step but the authorities must look at the total package because some of your competing ports have advantages that Savannah currently does not posses.

RESPONSE: No response necessary.

6. COMMENT: If the Port of Savannah is not elevated to the next level, the Port runs the risk not only of losing out on growth prospects but even losing some of your existing business. UASC as a mid-size carrier is also faced with the same type of dilemma, i.e. if we remain a niche operator without seeking expansion, this would be an uphill battle in a deregulated environment. We could therefore relate to the challenges ahead and we believe with sound planning and foresight both UASC and the Port Savannah could grow together in the years ahead.

RESPONSE: No response necessary.

ZIM-AMERICAN ISRAELI SHIPPING CO., INC.

222 WEST OGLETHORPE STREET
SUITE 202
SAVANNAH, GEORGIA 31401

POST OFFICE BOX 2907 TELEPHONE (912) 236-4263
SAVANNAH, GA 31402 FAX (912) 238-6011

June 18, 1998

Colonel Grant Smith
United States Army Corps of Engineers
Savannah District
100 W. Oglethorpe Avenue
P.O. Box 889
Savannah, GA 31402-0889

Re: Savannah Harbor Expansion
Draft Environmental Impact Statement ("DEIS")

Dear Colonel Smith:

I reference Savannah Area Chamber of Commerce letter dated June 17, 1998 reference as above.

When I supported the request for extension I was not fully aware of the time frame involved and the possible negative impact on this project. I therefore, wish to revoke my support for the extension. This project is of vital importance to the port and the economic growth of Savannah and Chatham County. I support the "Harbor Deepening Project" and believe it should be approved without delay.

Sincerely yours,

Walter I. Mitchell
Vice President,
South Atlantic District

cc: Mr. Robert J. Scanlon - Savannah Area Chamber of Commerce
Ms. Amy Hughes - Savannah Area Chamber of Commerce

Letter response

Mr. Walter I. Mitchell
Vice President, South Atlantic District

ZIM-AMERICAN ISRAELI SHIPPING CO., INC.
222 West Oglethorpe Street; Suite 202
Savannah, Georgia 31401
Post Office Box 2907
Savannah, GA 31402

Date: June 18, 1998

COMMENT: When I supported the request for an extension of the public review period I was not fully aware of the time frame involved and the possible negative impact on this project. I therefore, wish to revoke my support for the extension. This project is of vital importance to the port and the economic growth of Savannah and Chatham County. I support the "Harbor Deepening Project" and believe it should be approved without delay.

RESPONSE: Savannah District granted a 15-day extension in the public review period to allow time for all interested parties to express their views.

Individuals

Ms. Emma M. Adler

425 BULL STREET

MONTEREY SQUARE

SAVANNAH, GEORGIA 31401

HOME 912-234-0238 / FAX 912-234-1165

JUNE 7, 1998

William Bailey, Planning Division
U.S. Army Corps of Engineers
P.0. Box 889
Savannah, GA 31402

Dear Mr. Bailey,

Please weigh all considerations in your plans to deepen the Savannah River to 50 feet. Industrial and cultural resources as well as the health of human beings and wildlife should be a serious part of the equation.

Surely many ships would still come to the port with a 42 foot depth. In trying to become the deepest port, we may damage Savannah in ways which would take a greater toll on our overall well-being than the loss of some of the world's largest ships.

Sincerely,

Emma M. Adler

Letter response

Ms. Emma M. Adler
425 BULL STREET
MONTEREY SQUARE
SAVANNAH, GEORGIA 31401

JUNE 7, 1998

1. COMMENT:. Please weigh all considerations in your plans to deepen the Savannah River to 50 feet. Industrial and cultural resources as well as the health of human beings and wildlife should be a serious part of the equation.

RESPONSE: The project has been determined to be economically justified and environmentally acceptable.

2. COMMENT:. Surely many ships would still come to the port with a 42 foot depth. In trying to become the deepest port, we may damage Savannah in ways that would take a greater toll on our overall well-being than the loss of some of the world's largest ships.

RESPONSE: The forecasts were completed in accordance with federal guidelines for deep draft navigation studies. Specifically, the fleet mix and number of vessels projected to serve the Port of Savannah in the economic analysis over the next 50 years will change and was accounted for between alternative deepening projects.

Ms. Carolyn Allomon (May 26)

Carolyn Allmon
PO Box 372666
Satellite Beach, FL 32937

26 May 1998

Mr. M.J. Yuschishin
Chief, Planning Division
Department of the Army
Savannah District, Corps of Engineers
PO Box 889
Savannah, Georgia 31402-0889

Subj: Request for Extension of Period to Comment on Study for Savannah Harbor Expansion

Dear Mr. Yuschishin:

A little more than a week ago, I learned that a Study for Savannah Harbor expansion was being published. That Monday, I called Mr. Bailey to request that a copy be sent to me. He told me that a copy had been sent to me but he was putting a new copy in the mail. This morning I still had not received the copy and called to inquire about it. He assured me that the copy had been mailed last week and I should receive it soon. He told me that the first copy had been returned by Federal Express with an indication that I had moved and left no address. I am still using the same P.O. Box I have used for more than three decades.

I asked about the response period and was told that it was May 22. I have serious concerns about the project and property rights that may be affected. Though I have not seen the contents, it is very likely that I will want to comment. Mr. Bailey tells me the document consists of two large books so it will take some time to read and understand. Accordingly, I would like to request an extension for comments until 19 June.

I appreciate your consideration.

Yours very truly,

Carolyn Allmon

Letter response

Carolyn Allmon
PO Box 372666
Satellite Beach, FL 32937

May 26, 1998

COMMENT: Request for an extension of the comment period to June 19, 1998.

RESPONSE: The official public comment period ended on June 22. Savannah District informed Ms. Allmon that if necessary she could provide comments as late as June 29, 1998.

Ms. Carolyn Allmon (June 19)

Carolyn Allmon
PO Box 372666
Satellite Beach, FL 32937
FAX / Phone (407) 773 2456
19 June 1998

District Engineer
U.S. Army Corps of Engineers
Savannah District
Attn: Planning Division
PO Box 889
Savannah, Georgia 31402-0889

Subj: JOINT PUBLIC NOTICE DATED MAY 8, 1998
SAVANNAH HARBOR EXPANSION DRAFT

Dear Sirs:

The purpose of this letter is threefold: to request an extension of time to reply, to present preliminary objections to the plan, and to request a public hearing.

1. Request for Extension of Time to Reply

Your office tells me that I was included in the original mailing, but the package was returned to them because my address is to a post office box and the service they used does not deliver to post office boxes. The remailed package did not reach me until 3 June. (I wrote to you earlier asking for an extension, but that was before I received the remailed package and had no way of assessing the task of reviewing the package.) Now that I have seen it, because of the size and complexity of the document and because pages seem to be missing from the copy sent to me, I ask again for an extension to allow more time for review and preparation of a more adequate response.

2. Preliminary Objections to the Plan

All of the data and planning models in the plan are derived from the existing configuration of the channel. The document states that a shift in the channel alignment will be required to avoid the submerged pipelines. It further states that a ship simulation study will be conducted to determine if the larger ships can maneuver in the existing channel. If the ship simulation proves that changes in the channel configuration are necessary, all of the assumptions made based on the existing data may be invalid. This means that the real effects of salinity changes, changes in dissolved oxygen levels, wetlands destruction and other environmental impacts, bank erosion, side slope stability, and the true requirements for mitigation are unknown and therefore cannot be commented on by the public. Without better information, property owners cannot assess the impact of the changes on their

property. Therefore, I request that this plan not be approved and implemented until the studies are conducted that will give better data and the public has had an opportunity to comment on the probable impact of the project.

The DEIS moves very lightly over the concerns of property owners about hazardous materials being dumped on their land, saying only "Metal and chemical constituents of concern within the dredged sediments will be managed as necessary within the CDFs." (Ref DEIS par 4.1.2). As a property owner, I would like to know what metals and chemicals are in those sediments and request that my property, which is being used for dredge disposal, not be used as a concentrating area for metals and chemicals that are too environmentally damaging to be put in the neighboring creeks and rivers. Nothing in the easement taken by condemnation provides for that use.

The DEIS states "Effluent from the CDFs primarily originated in the Savannah River as bottom sediments and overlying river water and was not directly involved in any industrial process. On this basis, no significant impact should occur as a result of any of the above listed factors." The conclusion is suspect since the practice of agitation dredging of the berths with resultant deposition of sediments from those berths in the channel means that contaminants from the berths could be carried with the spoil into the CDFs. (Ref DEIS par 5.1.2.1.)

Further, par 6.2.3 states "Trace metals will likely be elevated, so the material should be placed in an approved CDF unless further Tier III testing is done to ensure that aquatic effects will not be at unacceptable levels." I ask that if levels are found to be unacceptable for aquatic effects, the material be considered unacceptable for placement on my property.

River Corridors - The Mountain and River Corridor Protection Act (O.C.G.A 12-2-1) requires a 100-foot vegetative buffer on both sides of rivers (page E-38 of DEIS). The consistency paragraph states that the project area is under the jurisdiction of the Coastal Marshlands Protection Act, rather than the River Corridor Protection Act, but states that the proposed project is fully consistent with this policy. Personal observation indicates that the vegetative buffers outside of the dikes are being seriously eroded and at an accelerating rate. What will be done to control the erosion, restore the eroded areas, and ensure that the vegetative buffers are maintained?

The section on consistency with South Carolina policies also deals with erosion control. This section promises that "dike raising actions would be performed using Best Management Practices to maximize erosion control during the construction process. What will be done after construction to prevent large sections of South Carolina river bank from being washed into the river from the prop wash of an increasing number of ever-larger ships?

Consistency Evaluation - Georgia - Scenic Trails, Georgia Uniform Conservatory Easement Act, Community Wildlife Project, Non-game Wildlife Conservation and Habitat Acquisition Fund, and Preservation 2000.

These requirements are uniformly brushed aside with the comment "the property is not owned in fee by the Corps,"' and "the owners of that properly are concerned about liability

for accidents to visitors to the sites if access is unrestricted." This obfuscation makes the answers seem less than candid. True the Corps does not own fee in the property but the State or Georgia or some division thereof does own fee in much of it and is certainly a party to the project. Wherever those policies are implemented, the state presumably does accept whatever liability goes with doing so. A more likely answer seems to be that the property is in South Carolina and Georgia has no need to comply with its own policies on that side of the River. While the project is in
technical consistency, the intent of these and other related policies is to ensure that the interests of the people in the use of the natural resources in their area are protected. Those interests have not been adequately treated in this project.

Natural Areas - The consistency section states that the site of the wetland creation area will be located within the harbor area and be selected during PED studies. The mitigation would be performed concurrent with construction of the proposed project. The public needs an opportunity to review and comment on mitigation plans before approval of the project.

Acres for Wildlife Program - Section 6.3 of Enclosure E indicates that this program is designed to help the "landowner manage the property for the welfare of the wildlife." Is the Corps acting as "landowner" on the property on which it has only a spoil easement? Does the Corps still intend to "provide active management of those sites to maximize wildlife habitat values as part of a mitigation program"?

Consistency Evaluation-South Carolina - The General Guidelines section sets forth a goal of "promoting the economic and social improvement of the citizens of this State and to encourage development of coastal resources in order to achieve such improvement."

The Harbor Improvement Project takes credit for compliance with this policy by saying some residents of South Carolina have jobs in Savannah. In fact, almost all of the economic benefits of the predicted commercial and industrial growth will accrue to Georgia and Georgians while twenty miles of South Carolina riverfront is used as a wasteland disposal area removed from any commercial, industrial or recreational use. Some of the South Carolina property may have another use - as mitigation for environmental damage done in constructing the harbor. The effect is still removal from economic or recreational use. It seems that, with the vast amounts of South Carolina real estate involved, a good faith attempt would find some way to provide some economic and recreational development on the South Carolina side of the River and thus allow the economically deprived citizens of Jasper County some benefits from the use of their resources. Such an effort is required for consistency with the spirit as well as the letter of South Carolina policy.

A cavalier attitude toward effects on recreational use by north bank citizens is shown in the comments concerning closing the lower end of Middle River and bend at Drakies Cut', i.e., "Those impacts are judged to affect only a small number of individuals." The minimal use by South Carolinians that has been caused by lack of access is going to be reduced further by this project.

Dredging -Section 7.3 states "Previous studies have shown the Savannah Harbor CDFs to be very effective traps of suspended sediments, retaining over 99 percent of the solids." It

further states that harbor sediments contain no toxic substances at hazardous levels. Studies are needed to determine if the trapped substances are building to hazardous levels on South Carolina lands in those highly effective CDF traps.

Surface Mining - This plan calls for surface mining of sand on property on which the Corps' easements give neither mining nor mineral rights. This is a violation of personal property rights and should not be approved nor funded unless those fights are secured.

3. Request for Public Hearing

Because of the seriousness of the damage that could be done by this project, the complexity of the issues involved, and the lack of information to property assess those issues, I request that no decision be made to proceed with the project until affected citizens have had an opportunity to express their concerns in a public hearing.

Yours very truly,

Carolyn Allmon

Letter response

Carolyn Allmon

PO Box 372666
Satellite Beach, FL 32937

19 June 1998

1. COMMENT -- Request for Extension of Time to Reply: Because of the size and complexity of the document and because pages seem to be missing from the copy sent to me, I ask again for an extension to allow more time for review and preparation of a more adequate response.

RESPONSE: Savannah District believes the 60-day comment period was sufficient to review the study documents.

Preliminary Objections to the Plan

2. COMMENT: If the ship simulation proves that changes in the channel configuration are necessary, all of the assumptions made based on the existing data may be invalid. This means that the real effects of salinity changes, changes in dissolved oxygen levels, wetlands destruction and other environmental impacts, bank erosion, side slope stability, and the true requirements for mitigation are unknown and therefore cannot be commented on by the public. Without better information, property owners cannot assess the impact of the changes on their property. Therefore, I request that this plan not be approved and implemented until the studies are conducted that will give better data and the public has had an opportunity to comment on the probable impact of the project.

RESPONSE: The preliminary channel design serves as the basis for considering project impacts. Additional studies in the CED phase will be used to further refine the design and develop a final mitigation plan.

3. COMMENT: The DEIS moves very lightly over the concerns of property owners about hazardous materials being dumped on their land, saying only "Metal and chemical constituents of concern within the dredged sediments will be managed as necessary within the CDFs." (Ref DEIS par 4.1.2). As a property owner, I would like to know what metals and chemicals are in those sediments and request that my property, which is being used for dredge disposal, not be used as a concentrating area for metals and chemicals that are too environmentally damaging to be put in the neighboring creeks and rivers. Nothing in the easement taken by condemnation provides for that use.

RESPONSE: All of the proposed project bend wideners were sampled as part of the dredged material environmental effects evaluation that supported the EIS and specifically the Section 404(b)(1) and Section 103 Evaluations that are required EIS attachments. A report prepared by ATM and available from the USACE details the results of the sediment and water sampling and analysis and the potential effects on the water column, benthic organisms, and terrestrial wildlife. The report did not find any contamination in the wideners that will likely create an unacceptable adverse condition on the area biotic communities. Further work is being conducted to provide assurances of these conclusions. Specifically, the GPA, USACE, and USEPA are developing a sampling and analysis effort to better quantify the potential effects of tributyltin on the aquatic and terrestrial environment and a more rigorous evaluation of bioaccumulative contaminants of concern will be undertaken to assess the risk of these organic compounds to avian wildlife using the Harbor CDF system as foraging habitat.

4. COMMENT: The DEIS states "Effluent from the CDFs primarily originated in the Savannah River as bottom sediments and overlying river water and was not directly involved in any industrial process. On this basis, no significant impact should occur as a result of any of the above listed factors." The conclusion is suspect since the practice of agitation dredging of the berths with resultant deposition of sediments from those berths in the channel means that contaminants from the berths could be carried with the spoil into the CDFs- (Ref DEIS par 5.1.2.1.)

RESPONSE: : The DMEEE evaluated project new work material including virgin sediments from below the existing project, new work material from the proposed bend wideners, and the existing project O&M material. The assessment, by considering representative sediments from these three types of sediments and in all project reaches, therefore has assessed the material proposed to construct this project including any contaminants that originally entered the project boundaries from outfalls or berths. It is also important to note that normally daily tidal flushing in the river moves a far greater amount of sediments from the berths to the federal project than agitation dredging activities. There can be no isolation of sediment-sorbed contaminants in the berths from the rest of the estuary. Hydrophobic compounds such as PAHs and dioxins can be found in other places in the estuary such as the Savannah Wildlife Refuge and the New River at concentrations higher than in the federal project.

5. COMMENT: Paragraph 6.2.3 states "Trace metals will likely be elevated, so the material should be placed in an approved CDF unless further Tier III testing is done to ensure that aquatic effects will not be at unacceptable levels." I ask that if levels are found to be unacceptable for aquatic effects, the material be considered unacceptable for placement on my property.

RESPONSE: The Section 404(b)(1) Evaluation will be revised to reflect the further evaluation conducted on these naturally-occurring metals concentrations in the virgin sediments and toxic effects are unlikely. Additionally, this analysis was conservative. The aquatic ecosystem is generally more sensitive to low levels of contaminants than terrestrial

systems. The metals in question are natural deposits, should be considered hazardous, and acceptable are acceptable for CDF placement

6. COMMENT -- River Corridors: The Mountain and River Corridor Protection Act (O.C.G.A 12-2-1) requires a 100-foot vegetative buffer on both sides of rivers (page E-38 of DEIS). The consistency paragraph states that the project area is under the jurisdiction of the Coastal Marshlands Protection Act, rather than the River Corridor Protection Act, but states that the proposed project is fully consistent with this policy. Personal observation indicates that the vegetative buffers outside of the dikes are being seriously eroded and at an accelerating rate. What will be done to control the erosion, restore the eroded areas, and ensure that the vegetative buffers are maintained?

RESPONSE: Although there may be existing concerns about vegetative buffers along the river, this project will not adversely affect shoreline erosion rates. Generally, as the channel section is enlarged velocities are decreased.

7. COMMENT: The section on consistency with South Carolina policies also deals with erosion control. This section promises that "dike raising actions would be performed using Best Management Practices to maximize erosion control during the construction process. What will be done after construction to prevent large sections of South Carolina riverbank from being washed into the river from the prop wash of an increasing number of ever-larger ships?

RESPONSE: The land owner has been historically responsible for the protection of their own property.

8. COMMENT -- Consistency Evaluation – Georgia: Scenic Trails, Georgia Uniform Conservatory Easement Act, Community Wildlife Project, Non-game Wildlife Conservation and Habitat Acquisition Fund, and Preservation 2000.

These requirements are uniformly brushed aside with the comment "the property is not owned in fee by the Corps," and "the owners of that properly are concerned about liability for accidents to visitors to the sites if access is unrestricted." This obfuscation makes the answers seem less than candid. True the Corps does not own fee in the property but the State or Georgia or some division thereof does own fee in much of it and is certainly a party to the project. Wherever those policies are implemented, the state presumably does accept whatever liability goes with doing so. A more likely answer seems to be that the property is in South Carolina and Georgia has no need to comply with its own policies on that side of the River. While the project is in technical consistency, the intent of these and other related policies is to ensure that the interests of the people in the use of the natural resources in their area are protected. Those interests have not been adequately treated in this project.

RESPONSE: The EIS has adequately addressed these concerns.

9. COMMENT -- Natural Areas: The consistency section states that the site of the wetland creation area will be located within the harbor area and be selected during PFD studies. The mitigation would be performed concurrent with construction of the proposed project. The public needs an opportunity to review and comment on mitigation plans before approval of tile project.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

10. COMMENT -- Acres for Wildlife Program: Section 6.3 of Enclosure E indicates that this program is designed to help the "landowner manage the property for the welfare of the wildlife." Is the Corps acting as "landowner" on the property on which it has only a spoil easement? Does the Corps still intend to "provide active management of those sites to maximize wildlife habitat values as part of a mitigation program"?

RESPONSE: The Corps is required to conduct its activities in an environmentally responsible manner. The 1996 LTMS identified the best plan for overall management of the harbor - including the CDFs - was for management of the CDFs for the benefit of wildlife in concert with their use for dredged material disposal operations. No action will be performed at the CDFs that is not allowed under the existing real estate agreements.

11. COMMENT -- Consistency Evaluation-South Carolina: The General Guidelines section sets forth a goal of "promoting the economic and social improvement of the citizens of this State and to encourage development of coastal resources in order to achieve such improvement." The Harbor Improvement Project takes credit for compliance with this policy by saying some residents of South Carolina have jobs in Savannah. In fact, almost all of the economic benefits of the predicted commercial and industrial growth will accrue to Georgia and Georgians while twenty miles of South Carolina riverfront is used as a wasteland disposal area removed from any commercial, industrial or recreational use. Some of the South Carolina property may have another use - as mitigation for environmental damage done in constructing the harbor. The effect is still removal from economic or recreational use. It seems that, with the vast amounts of South Carolina real estate involved, a good faith attempt would find some way to provide some economic and recreational development on the South Carolina side of the River and thus allow the economically deprived citizens of Jasper County some benefits from the use of their resources. Such an effort is required for consistency with the spirit as well as the letter of South Carolina policy.

RESPONSE: The CDFs located in SC are an important component of the Federal Navigation Project, and as such are vital to the economic and commercial interests that the harbor supports.

12. COMMENT: A cavalier attitude toward effects on recreational use by north bank citizens is shown in the comments concerning closing the lower end of Middle River and

bend at Drakies Cut, i.e., "Those impacts are judged to affect only a small number of individuals." The minimal use by South Carolinians that has been caused by lack of access is going to be reduced further by this project.

RESPONSE: The DEIS acknowledges this restriction to boating access in evaluating the affects of the Middle River closure salinity avoidance feature. Additional studies in the CED phase will further evaluate the changes caused by this closure.

13. COMMENT – Dredging: Section 7.3 states "Previous studies have shown the Savannah Harbor CDFs to be very effective traps of suspended sediments, retaining over 99 percent of the solids." It further states that harbor sediments contain no toxic substances at hazardous levels. Studies are needed to determine if the trapped substances are building to hazardous levels on South Carolina lands in those highly effective CDF traps.

RESPONSE: See response to Comment #3 above.

14. COMMENT -- Surface Mining: This plan calls for surface mining of sand on property on which the Corps' easements give neither mining nor mineral rights. This is a violation of personal property rights and should not be approved nor funded unless those fights are secured.

RESPONSE: The dikes will be raised and constructed full accordance with the appropriate easements that apply.

15. COMMENT -- Request for Public Hearing: Because of the seriousness of the damage that could be done by this project, the complexity of the issues involved, and the lack of information to property assess those issues, I request that no decision be made to proceed with the project until affected citizens have had an opportunity to express their concerns in a public hearing.

RESPONSE: GPA has been meeting with individual groups and agencies during the Public Comment period, and plans to hold public information meetings and hearings during the CED phase as part of the preparation of the Tier II EIS.

Ms. Carolyn Allmon
PO Box 372666
Satellite Beach, FL 32937
FAX/Phone (407) 773 2456
3 July 1998

District Engineer
U.S. Army Corps of Engineers
Savannah District
Attn: Planning, Division
PO Box 889
Savannah, Georgia 31402-0889

Subj: JOINT PUBLIC NOTICE DATED MAY 8, 1998 -- SAVANNAH HARBOR EXPANSION -- DRAFT

Dear Sirs:

The purpose of this letter is threefold: to request an extension of time to reply, to present preliminary objections to the plan, and to request a public bearing.

1. Request for Extension of Time to Reply

Thank you for extending the reply time from the original June 23 to July 7. However, because of the size and complexity of the document, because the document is incomplete, and because my study of the plan revealed a need for other documents that I have requested but do not have yet, I ask for an additional extension to allow more time for review and preparation of a more adequate response.

Examples of sections missing from the document are:
Feasibility Study - Portions of Evaluation of Final Alternatives
Real Estate Appendix - Exhibit A, Exhibit B, Exhibit C, and Exhibit D

2. Objections to the Plan

All of the data and planning models supporting the plan are derived from the existing configuration of the channel. The document states that a shift in the channel alignment will be required to avoid the submerged pipelines. It further states that a ship simulation study will be conducted to determine if the larger ships can maneuver in the existing channel. If the ship simulation proves that changes in the channel configuration are necessary, all of the assumptions made based on the existing data may be invalid. This means that the real

effects of salinity changes, changes in dissolved oxygen levels, wetlands destruction and other environmental impacts, bank erosion, side slope stability, and the true requirements for mitigation are unknown and therefore cannot be realistically commented on by the public. Without better information, property owners cannot assess the impact of the changes on their property. Therefore, I request that this plan not be approved and implemented until the studies are conducted that will give better data and the public has had an opportunity to comment on the probable impact of the project.

The DEIS moves very lightly over the concerns of property owners about hazardous materials being dumped on their land, saying only "Metal and chemical constituents of concern within the dredged sediments will be managed as necessary within the CDFs." (Ref DEIS par 4.1.2). As a property owner, I would like to know what metals and chemicals are in those sediments and ask that my property, which is being used for dredge disposal, not be used as a concentrating area for metals and chemicals that are too environmentally damaging to be put in the neighboring creeks and rivers. Nothing in the easement taken by condemnation provides for that use.

The DEIS states "Effluent from the CDFs primarily originated in the Savannah River as bottom sediments and overlying river water and was not directly involved in any industrial process. On this basis, no significant impact should occur as a result of any of the above listed factors." The conclusion is suspect since the practice of agitation dredging of the berths with resultant deposition of sediments from those berths in the channel means that contaminants from the berths could be carried with the spoil into the CDFs. (Ref DEIS par 5.1.2.1.)

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The section on consistency with South Carolina policies also deals with erosion control. This section promises that "dike raising actions would be performed using Best Management Practices to maximize erosion control during the construction process. This is to ask that the project not be approved until provisions are made not only during construction but also after construction to prevent large sections of

South Carolina river bank from being washed into the river from the prop wash of an increasing number of ever-larger ships?

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These requirements are uniformly brushed aside with the comment "the property is not owned in fee by the Corps," and “the owners of that property are concerned about liability for accidents to visitors to the sites if access is unrestricted." This obfuscation makes the answers seem less than candid. True the Corps does not own fee in the property but the **State of Georgia** or some division thereof does own fee in much of it and is certainly a party to the project. Wherever those policies are implemented, the state presumably does accept whatever liability goes with doing so. A more likely answer seems to be that the property is in South Carolina and Georgia has no need to comply with its own policies on that side of the River. While the project is in technical consistency, the intent of these and other related policies is to ensure that the interests of the people in the use of the natural resources in their area are protected. Those interests have not been adequately treated in this project.

Natural Areas - The consistency section states that the site of the wetland creation area will be located within the harbor area and be selected during PED studies. The mitigation would be performed concurrent with construction of the proposed project. The public needs an opportunity to review and comment on mitigation plans before approval of the project.

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Some of the South Carolina property may have another use - as mitigation for environmental damage done in constructing the harbor. The effect is still removal from economic or recreational use. It seems that, with the vast amounts of South Carolina real estate involved,

a good faith attempt would find some way to provide some economic and recreational development on the South Carolina side of the River and thus allow the economically deprived citizens of Jasper County some benefits from the use of their resources. Such an effort is required for consistency with the spirit as well as the letter of South Carolina policy.

A cavalier attitude toward effects on recreational use by north bank citizens is shown in the comments concerning closing the lower end of Middle River and bend at Drakies Cut- i.e., "Those impacts are judged to affect only a small number of individual." The minimal use by South Carolinians that has been caused by lack of access is going to be reduced further by this project.

Dredging - Section 7.3 states " Previous studies have shown the Savannah Harbor CDFs [to] be very effective traps of suspended sediments, removing over 99 percent of the solids." It further states that harbor sediments contain no toxic substances at hazardous levels. Studies are needed to determine if the trapped substances are building to hazardous levels on South Carolina lands in those highly effective CDF traps.

Surface Mining - This plan calls for surface mining of sand on property on which the Corps' easements give neither mining nor mineral rights. This is a violation of personal property rights and should not be approved nor funded unless those rights are secured.

3. Additional Comments

In Paragraph 9 of the feasibility study, claims are made to have conducted a campaign to inform and involve those with interests in the study. It states "The report and EIS were also made available to all known private citizens, organizations, and others who have an interest in Savannah Harbor and proposed harbor improvements." As a property owner, I qualify to be included. I was never notified and did not participate in any discussion meeting. I was not even aware of the availability of the draft plan until I teamed from another private citizen that it had been distributed. I inquired and was told I had been sent a copy, but it had been returned to the Corps because my address was a post office box and the service they use will not deliver to a post office box. After my request, a copy was sent to my post office box. It was not received until 3 June. Since I have had considerable interaction with the Corps over nine (in person, by phone, and by letter) on matters concerning the Savannah Harbor, I feel that I should not have been excluded from the efforts “to involve those with interest."

4. Request for Public Hearing

Because of the seriousness of the damage that could be done by this project, the complexity of the issues involved, and the lack of information to properly assess those issues, I request that no decision be made to proceed with the project until affected citizens have had an opportunity to express their concerns in a public

Yours very truly,

Carolyn Allmon

Letter response

Ms. Carolyn Allmon
PO Box 372666
Satellite Beach, FL 32937
FAX / Phone (407) 773 2456
3 July 1998

(Note: Other comments in this letter were addressed in the response to the letter from Ms. Allmon dated June 19)

COMMENT:

3. Additional Comments

In Paragraph 9 of the feasibility study, claims are made to have conducted a campaign to inform and involve those with interests in the study. It states "The report and EIS were also made available to all known private citizens, organizations, and others who have an interest in Savannah Harbor and proposed harbor improvements." As a property owner, I qualify to be included. I was never notified and did not participate in any discussion meeting. I was not even aware of the availability of the draft plan until I teamed from another private citizen that it had been distributed. I inquired and was told I had been sent a copy, but it had been returned to the Corps because my address was a post office box and the service they use will not deliver to a post office box. After my request, a copy was sent to my post office box. It was not received until 3 June. Since I have had considerable interaction with the Corps over nine (in person, by phone, and by letter) on matters concerning the Savannah Harbor, I feel that I should not have been excluded from the efforts “to involve those with interest."

RESPONSE: The public information program was primarily directed to the Savannah area (published in the Savannah newspaper, scoping meetings held in Savannah). Ms. Allmon was provided with a copy of the draft documents at the same time they were available to the general public. There was no intent to exclude any individual or organization from the public involvement process.

Mr. Norman Axnick

Copy of a handwritten letter

85 Van Horne Drive #20A
Tybee Island, Georgia 31328

July 6, 1998

Mr. William Bailey
U.S. Army Corps of Engineers
P.O. Box 889
Savannah, Georgia 31402-0889

RE: Proposed Savannah Harbor Deepening

Dear Mr. Bailey:

Man-made shipping channels, which alter water currents, contribute to beach erosion, according to coastal geologists. During the past decade, there appears to be an increase in beach erosion on the northern tip of Tybee Island, adjacent to the river channel. The proposal and the DEIS does not address the benefits and costs to the City of Tybee Island of harbor deepening, especially the effects of additional beach erosion. A proposal to place some of the sediment on the northern part of Tybee merits consideration as part of the harbor deepening effort rather than the proposed offshore placement.

Sincerely yours,

Normin Axnick

Letter response

Mr. Normin Axnick
85 Van Horne Drive #20A
Tybee Island, Georgia 31328

Date: July 6, 1998

1. COMMENT: Man-made shipping channels, which alter water currents, contribute to beach erosion, according to coastal geologists. During the past decade, there appears to be an increase in beach erosion on the northern tip of Tybee Island, adjacent to the river channel.

RESPONSE: The DEIS acknowledges that beach erosion can sometimes be caused by shipping channels, as well as sea level rise and many other factors.

2. COMMENT: The proposal and the DEIS does not address the benefits and costs to the City of Tybee Island of harbor deepening, especially the effects of additional beach erosion. A proposal to place some of the sediment on the northern part of Tybee merits consideration as part of the harbor deepening effort rather than the proposed offshore placement.

RESPONSE: The expected impacts to Tybee Island were evaluated in the study. The Coastal Erosion Study, in particular, considered potential effects on Tybee from deepening the navigation channel and several locations for placement of the excavated sediments. The nearshore placement of sediments removed from the entrance channel will be reevaluated during the CED phase of the project.

Mr. Alan. C. Bailey

Alan C. Bailey
One Rockwell Avenue South
Savannah, GA 31419
Phone: (912)925-3159

30 June 1998

Mr. William Bailey
Attn: SESASPO-E
US Army Corps of Engineers
PO Box 889
Savannah, GA 31402-0889

Dear Mr. Bailey:

This letter is to provide comment on the Savannah harbor and channel deepening project. As a user of the Savannah National Wildlife Refuge, I am greatly concerned that the proposed project will negatively impact the Refuge and the surrounding environment and believe that the effects of the deepening project have not been adequately studied. I urge the Corps not to issue a permit for this project until an adequate study by impartial entities has been completed. It seems unlikely that the relatively small amount that has been budgeted for environmental mitigation would be nearly enough, but the major problem is lack of knowledge about the impacts. The study to rectify this lack of knowledge should address all concerns that have been raised about the significant impact that a major federal action will have on the quality of the lower Savannah River environment. Thank you.

Sincerely,

Alan C. Bailey

Letter response

Alan C. Bailey
One Rockwell Avenue South
Savannah, GA 31419

Date: June 30, 1998

COMMENT: As a user of the Savannah National Wildlife Refuge, I am greatly concerned that the proposed project will negatively impact the Refuge and the surrounding environment and believe that the effects of the deepening project have not been adequately studied. I urge the Corps not to issue a permit for this project until an adequate study by impartial entities has been completed. It seems unlikely that the relatively small amount that has been budgeted for environmental mitigation would be nearly enough, but the major problem is lack of knowledge about the impacts. The study to rectify this lack of knowledge should address all concerns that have been raised about the significant impact that a major federal action will have on the quality of the lower Savannah River environment.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

Dr. L.B. Davenport, Jr.

18 June 98

Mr. William Bailey
Planning Division
U.S. Army Corps of Engineers
P.0. Box 889
Savannah, GA 31402

Re: Further deepening of the Savannah River Channel

Dear Mr. Bailey,

Further deepening of the Savannah River channel and harbor is a decidedly dubious proposition. As a biologist my primary concern is for damage to the Savannah National Wildlife Refuge. There are also other adverse factors that must be addressed. Deepening this channel will be a major Federal action that will have a significant, adverse impact on the human environment. A detailed, carefully prepared, impartial environmental impact statement is essential in this situation. "Fast Track" status for this proposal is absolutely not justified.

Of the 6,000 acres of tidal freshwater wetlands originally contained within the Savannah Refuge, only about a third - 2,000 acres - remain. The environmental impact statement of the Georgia Ports Authority indicates that some 1,200 acres of that will be affected by salt water if the preferred option of a 50-foot depth is funded. This amounts to final destruction of a major Federal wildlife refuge of virtually unique biological nature. Tidal freshwater wetlands have never been plentiful and those that existed have largely been destroyed by other foolish human endeavors. There is no mitigation for damage to the Savannah Refuge.

Further, there is no reasonably feasible engineering undertaking that will permit deepening the harbor to any extent without major damage to the Refuge. It has never recovered from the effects of the notorious tide gate (which we were assured by the Corps of Engineers would not harm it) and of the last deepening to the present depth. The errors of the estimates of salt water encroachment for those engineering feats are topics of ridicule far and wide. There is no need for more of them.

Beyond the concerns for the Savannah Refuge are concerns about salt incursion at the intake for the I&D water treatment plant of the City of Savannah and for those of Union Camp and Stone Container Corporations. That would cost those entities many millions of dollars, not only in initial capital outlay, but also in subsequent annual operational costs.

Available fresh water, both for human consumption and for industrial use, has recently become a major concern for Chatham County and the other 27 counties of the lower coastal plain which are heavily dependent upon the Floridan Aquifer for their supply. Any undertaking having significant probability of any sort of adverse influence upon the integrity or quantity of available fresh water in those counties should have overwhelming benefit for all of their populations in order to be given any consideration whatever.

While further deepening the channel would benefit the Georgia Ports Authority and shipping concerns using their facilities, the balance of the economic cost/benefit ratio seems quite obscure. It is not at all clear that whatever benefits accrued would not be largely offset by harm done. Suits resulting from damages done by the last deepening of the channel are still in litigation. A careful, impartial cost/benefit analysis by an independent, highly qualified, outside agency certainly seems indicated.

I strongly urge (1) that consideration of applications for permits for deepening the channel of the Savannah River not be given "Fast Track" status and (2) that all such applications ultimately be denied.

Very truly yours,

L.B. Davenport, Jr., Ph.D.
Professor Emeritus of Biology
Armstrong Atlantic State University

Mailing address:

726 Windsor Road
Savannah, GA 31419-2401

Letter response

L.B. Davenport, Jr., Ph.D.
Professor Emeritus of Biology
Armstrong Atlantic State University
726 Windsor Road
Savannah, GA 31419-2401

18 June 98

1. COMMENT: Further deepening of the Savannah River channel and harbor is a decidedly dubious proposition. My primary concern is for damage to the SNWR. There are also other adverse factors that must be addressed. Deepening this channel will be a major Federal action that will have a significant, adverse impact on the human environment. A detailed, carefully prepared, impartial environmental impact statement is essential in this situation. "Fast Track" status for this proposal is absolutely not justified.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS. Congressional authorization will require completion of the NEPA process prior to construction of the project.

2. COMMENT: Of the 6,000 acres of tidal freshwater wetlands originally contained within the Savannah Refuge, only about a third - 2,000 acres - remain. The environmental impact statement of GPA indicates that some 1,200 acres of that will be affected by salt water if the preferred option of a 50-foot depth is funded. This amounts to final destruction of a major Federal wildlife refuge of virtually unique biological nature. Tidal freshwater wetlands have never been plentiful and those that existed have largely been destroyed by other foolish human endeavors. There is no mitigation for damage to the Savannah Refuge.

RESPONSE: Section 5.7.3 of the DEIS explains that the zone of potential impact to freshwater marsh only includes the area of marsh which was previously affected by operation of the tidegate. As a result, the existing vegetation is not expected to be adversely changed.

3. COMMENT: Further, there is no reasonably feasible engineering undertaking that will permit deepening the harbor to any extent without major damage to the Refuge. It has never recovered from the effects of the notorious Tidegate (which we were assured by the Corps of Engineers would not harm it) and of the last deepening to the present depth. The errors of the estimates of salt water encroachment for those engineering feats are topics of ridicule far and wide. There is no need for more of them.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

4. COMMENT: Beyond the concerns for the Savannah Refuge are concerns about salt incursion at the intake for the I&D water treatment plant of the City of Savannah and for those of Union Camp and Stone Container Corporations. That would cost those entities many millions of dollars, not only in initial capital outlay, but also in subsequent annual operational costs.

RESPONSE: The EIS will be revised to include further studies of the cause and effect relationship between salinity increases from the project and chloride levels at the City's water intake. The project will also include costs for the potential mitigation efforts resulting from an increase in chlorides. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

5. COMMENT: Available fresh water, both for human consumption and for industrial use, has recently become a major concern for Chatham County and the other 27 counties of the lower coastal plain which are heavily dependent upon the Floridan Aquifer for their supply. Any undertaking having significant probability of any sort of adverse influence upon the integrity or quantity of available fresh water in those counties should have overwhelming benefit for all of their populations in order to be given any consideration whatever.

RESPONSE: The project will not adversely impact the Floridan aquifer. There is some concern that the City's surface water supply may be affected. The EIS will be revised to include further studies of the cause and effect relationship between salinity increases from the project and chloride levels at the City's water intake. The project will also include costs for the potential mitigation efforts resulting from an increase in chlorides. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

6. COMMENT: While further deepening the channel would benefit GPA and shipping concerns using their facilities, the balance of the economic cost/benefit ratio seems quite obscure. It is not at all clear that whatever benefits accrued would not be largely offset by harm done. Suits resulting from damages done by the last deepening of the channel are still in litigation. A careful, impartial cost/benefit analysis by an independent, highly qualified, outside agency certainly seems indicated.

RESPONSE: There are no current suits in litigation regarding the 1994 Savannah Harbor Deepening Project.

7. COMMENT: I strongly urge (1) that consideration of applications for permits for deepening the channel of the Savannah River not be given "Fast Track" status and (2) that all such applications ultimately be denied.

RESPONSE: The procedures followed by GPA for authorization and eventual construction of a deeper harbor are allowed under existing Federal laws and regulations.

Ms. Judy Jennings

Judy Jennings
7609 LaRoche Avenue
Savannah, GA 31406
(921)352-0122
(921)356-3070 FAX

June 19, 1998

Mr. William G. Bailey
U. S. Army Corps of Engineers, PD-E
P, 0. Box 889
Savannah, GA 31402-0889

Dear Mr. Bailey:

The Georgia Ports Authority's Draft Environmental Impact Statement on the Savannah Harbor Expansion is deficient in that it does not include modeling for all options. All options between the current 42 feet depth and 50 feet depth should be thoroughly explored for their environmental impacts. The relationships can not be assumed to be linear.

The economic analysis is not adequate. All costs should be considered. Efforts to ameliorate and mitigate for adverse impacts to the Savannah National Wildlife Refuge, striped bass and short nose sturgeon habitat, water quality for the City of Savannah, historic structures, Tybee beach, water using industries, and other harbor facilities should be thoroughly accounted.

So that these analyses can be completely assessed, the comment period should be extended.

Sincerely,

Judy Jennings

cc: Governor Zell Miller
Representative Jack Kingston
Senator Max Cleland
Senator Paul Coverdell

Letter response

Ms. Judy Jennings
7609 LaRoche Avenue
Savannah, GA 31406

June 19, 1998

1. COMMENT: GPA's DEIS is deficient in that it does not include modeling for all options. All options between the current 42 feet depth and 50 feet depth should be thoroughly explored for their environmental impacts. The relationships can not be assumed to be linear.

RESPONSE: The proposed scope of the DEIS was stated as a "worst case scenario" addressing the potential impacts of the deepest alternative, a 50 foot channel. All other alternative project depths would have less impact. Additional studies will be performed in the CED phase to evaluate alternative depths..

2. COMMENT: The economic analysis is not adequate. All costs should be considered. Efforts to ameliorate and mitigate for adverse impacts to the SNWR, striped bass and short nose sturgeon habitat, water quality for the City of Savannah, historic structures, Tybee beach, water using industries, and other harbor facilities should be thoroughly accounted.

RESPONSE: The economic analysis was completed and documented in accordance with federal guidelines for deep draft navigation studies. All required costs, including construction and environmental costs, were accounted for in the economic analysis.

3. COMMENT: So that these analyses can be completely assessed, the comment period should be extended.

RESPONSE: Savannah District extended the comment period until July 7, 1998.

Mr. Nick Mamalakis

NICK J. MAMALAKIS
131 SUMMER WINDS DRIVE SAVANNAH, GEORGIA 31410 912-897-9976

June 23, 1998

Mr. William Bailey
Planning Division,
Environmental Research Branch
U. S. Corps of Engineers
PO Box 889
Savannah, GA 31402

Dear Mr. Bailey,

On the subject of the Georgia Ports application for the deepening of the Savannah River harbor, please know that I am fully in support of the imperative need to proceed with this work,

I am a native Savannahian. When I graduated front school, (SHS - 1932) the population of Chatham County was slightly larger than Charleston, and only slightly smaller than that of Jacksonville. Today, Charleston is 2-1/4 the size of Savannah and Jacksonville 3-1/2 our size. Much of the growth difference over these years is the fact that the other two cities - our main and aggressive competitors - were given much attention by the military needs of those ports.

I have served the State of Georgia on the Department of Industry & Trade. The Georgia Ports has been one of the big reasons for the resurgence of the economies of both Savannah and Georgia. GA Ports generates almost 70,000 jobs throughout the State and 10% of that is in the immediate Savannah area. It is of critical importance that the needs of the Georgia Ports be addressed and encouraged in order to keep up with the demands of the shipping industry.

I am sure that you will address the environmental issues fairly, but the importance of the ports to the breadwinners who depend on the ports for their livelihood must weigh heavily in favor of the dire need to deepen the harbor as proposed.

Sincerely

Nick Mamalakis

Letter response

NICK J. MAMALAKIS
131 SUMMER WINDS DRIVE
SAVANNAH, GEORGIA 31410

June 23, 1998

1. COMMENT: On the subject of the Georgia Ports application for the deepening of the Savannah River harbor, please know that I am fully in support of the imperative need to proceed with this work,

RESPONSE: GPA is encouraged by the support for this proposed project.

2. COMMENT: I am a native Savannahian. When I graduated from school, (SHS - 1932) the population of Chatham County was slightly larger than Charleston, and only slightly smaller than that of Jacksonville. Today, Charleston is 2-1/4 the size of Savannah and Jacksonville 3-1/2 our size. Much of the growth difference over these years is the fact that the other two cities - our main and aggressive competitors - were given much attention by the military needs of those ports.

RESPONSE: GPA supports the military's use of Savannah Harbor. It makes its facilities available to the Army to serve its rapid deployment needs in any way it can.

3. COMMENT: I have served the State of Georgia on the Department of Industry & Trade. GPA has been one of the big reasons for the resurgence of the economies of both Savannah and Georgia. GPA generates almost 70,000 jobs throughout the State and 10% of that is in the immediate Savannah area. It is of critical importance that the needs of the GPA be addressed and encouraged in order to keep up with the demands of the shipping industry.

RESPONSE: No response necessary.

4. COMMENT: I am sure that you will address the environmental issues fairly, but the importance of the ports to the breadwinners who depend on the ports for their livelihood must weigh heavily in favor of the dire need to deepen the harbor as proposed.

RESPONSE: No response necessary.

Mr. Edgar F. Meyer

Copy of a handwritten letter
Postmarked July 3, 1998

Mr. Edgar F. Meyer
2011 Ashley Road
Savannah, GA 31410-4203

Dear Mr. Bailey:

I understand that the Corps is requesting public comment on the proposed deepening of our navigational channel to as much as 50 feet and you are requesting citizen input.

I see no reason why this should not be done as quickly as possible. If the Ports Authority and related business have said it is needed to be competitive with Jacksonville, Charleston, Brunswick, and Norfolk, then it has to be done to maintain the leading edge as Savannah has and always should be the most aggressive competitive seaport in the Southeast.

We have spent monies to build a higher bridge when it was needed, we are building the new #7 terminal & I think talk of #8 and spending millions on a Trade and Conference Center on Hutchinson Island.

With all this going on and the money invested there should be no question as to deepening the river. We need to achieve the position of number 1 port in the Southeast. We also need to load and handle all Fort Stewart's supply ship requirements as these ships could be getting larger as the world shrinks to handle military requirements.

I am not against ecology, but in this case we must weigh what might happen to a few plants and some fish vs. an entire industry. Savannah has always been a seaport and we need to continue to grow and build for the future Crown Jewel of the Southeast. We have the vitality for it and with the right leadership we might be able to satisfy both factors, but the river must be deepened. Even now periodically the silt must be dredged.

We have the Industry, River Street, Hutchinson, the Ports, Historic Savannah, what more do we need to make this City prosper. If we do it right now we will gain in the long run.

Sincerely,

Ed Meyer

Letter response

Mr. Edgar F. Meyer
2011 Ashley Road
Savannah, GA 31410-4203

Date: July 3, 1998

1. COMMENT: I see no reason why this should not be done as quickly as possible. If the Ports Authority and related business say it is needed to be competitive with Jacksonville, Charleston, Brunswick, and Norfolk, then it has to be done to maintain the leading edge as Savannah has and always should be the most aggressive competitive seaport in the Southeast.

RESPONSE: The economic analysis indicates that shipping lines will use larger vessels to concentrate their business in the ports that can efficiently move cargo over both the water and landside components of a harbor. This harbor improvement would allow the Port of Savannah to better meet the needs f those shippers.

2. COMMENT: We have spent monies to build a higher bridge when it was needed, we are building the new #7 terminal & I think talk of #8 and spending millions on a Trade and Conference Center on Hutchinson Island. With all this going on and the money invested there should be no question as to deepening the river. We need to achieve the position of number 1 port in the Southeast.

RESPONSE: GPA believes the proposed harbor deepening would be a wise expenditure of funds. The economic analysis confirms that the project would return more in economic benefits than it would cost.

3. COMMENT: We also need to load and handle all Fort Stewart's supply ship requirements as these ships could be getting larger as the world shrinks to handle military requirements.

RESPONSE: The deeper channel would reduce any tidal delays that the military vessels would experience as they move the equipment of the 3rd Infantry through the port.

4. COMMENT: I am not against ecology, but in this case we must weigh what might happen to a few plants and some fish vs. an entire industry. Savannah has always been a seaport and we need to continue to grow and build for the future Crown Jewel of the Southeast. We have the vitality for it and with the right leadership we might be able to satisfy both factors, but the river must be deepened. Even now periodically the silt must be dredged.

RESPONSE: GPA believes the proposed project is both economically justified and environmentally acceptable. Mitigation is included in the project to compensate for impacts that could not be avoided.

5. COMMENT: We have the Industry, River Street, Hutchinson, the Ports, Historic Savannah, what more do we need to make this City prosper. If we do it right now we will gain in the long run.

RESPONSE: GPA intended this project to enhance the economy of the local community and the State at large. This project is envisioned as a way for multiple parties and interests to benefit.

Mrs. Henry H. Nichols

Copy of a handwritten letter

Mrs. Henry H. Nichols
7630 LaRoche Avenue
Savannah, GA 31406-6404

July 7, 1998

The GPA is no different from our other developers. If what they want to do disturbs wetlands and wildlife, then don't do it.

We can't replace life, once its gone.

Sincerely,

Mrs. H. H. Nichols

Letter response

Mrs. Henry H. Nichols
7630 LaRoche Avenue
Savannah, GA 31406-6404

Date: July 7, 1998

COMMENT: The GPA is no different from our other developers. If what they want to do disturbs wetlands and wildlife, then don't do it.

RESPONSE: The project GPA proposes would have to comply with all applicable laws and regulations.

Mr. Charles E. Powell

Handwritten letter

Mr. William Bailey
U.S. Army Corps of Engineers
P.O. Box 889
Savannah, Georgia 31402-0889

July 2, 1998

Dear Mr. Bailey:

Please enter my written comments in the records of the proposed harbor deepening project of the Savannah River.

As a resident, home owner on Tybee Island, Georgia, I am concerned about the adverse effect the proposed deepening project will have on our fragile beaches.

Many studies have shown that the dredging of the Savannah River robs Tybee Island of tons of sand that normally and naturally migrate from north to south along our coast, thus eroding our beaches.

The current 42 foot depth has proven to be very detrimental to our beaches. I believe a 50 foot depth would be disastrous.

Most troubling of all, the Corps' proposal does not even address the issue of beach erosion and renourishment.

I urge the Corps to keep the river at the 42 foot depth and permanently tie harbor maintenance to beach nourishment.

I am opposed to any deepening of the river.

Sincerely,

Charles E. Powell
P.O. Box 1804
Tybee Island, Georgia 31328

Letter response

Charles E. Powell
P.O. Box 1804
Tybee Island, Georgia 31328

Date: July 2, 1998

1. COMMENT: As a resident and homeowner on Tybee Island, I am concerned about the adverse effect the proposed deepening project will have on our fragile beaches.

RESPONSE: GPA is also concerned about the potential for adverse effects on Tybee Island. A portion of the feasibility effort was directed to identify and evaluated the potential for project effects on Tybee Island as part of their Preliminary Coastal Erosion Study. The results of that investigation were included in the EIS.

2. COMMENT: Many studies have shown that the dredging of the Savannah River robs Tybee Island of tons of sand that normally and naturally migrate from north to south along our coast, thus eroding our beaches. The current 42-foot depth has proven to be very detrimental to our beaches. I believe a 50-foot depth would be disastrous.

RESPONSE: No studies have shown conclusively that navigation channel causes a specific amount of erosion on Tybee Island. Additionally, construction of the 42-foot channel resulted in the placement of channel sediments on Tybee Beach, effectively nourishing a portion of that beach.

3. COMMENT: Most troubling of all, the Corps' proposal does not even address the issue of beach erosion and renourishment.

RESPONSE: ATM prepared a Preliminary Coastal Erosion Study that evaluated the potential effects of the proposed project on beaches within 10 miles of the project. That evaluation included the issue of beach erosion and the need to renourish those beaches.

4. COMMENT: I urge the Corps to keep the river at the 42 foot depth and permanently tie harbor maintenance to beach nourishment.

RESPONSE: The deposition of suitable sediments obtained during maintenance of the entrance channel was evaluated during the Savannah District's 1996 LTMS Study. Environmental approvals were obtained for placement of entrance channel sediments in the nearshore area or on the beach. The Corps would pursue such placement when the costs would be less than that for placement in the ODMDS.

5. **COMMENT:** I am opposed to any deepening of the river.

RESPONSE: No response necessary.

Mr. Sidney L. Raskin

LAW OFFICES
RASKIN & DEBELE
114 OGLETHORPE AVE. EAST
SAVANNAH, GEORGIA 31401
(912) 236-0241

June 24, 1998

Mr. William Bailey
Environmental Resources Branch
Army Corps of Engineers
P.O. Box 889
Savannah, GA 31402

RE: SAVANNAH RIVER CHANNEL DEEPENING
AND TYBEE ISLAND BEACH RENOURISHMENT

Dear Mr. Bailey:

The undersigned is a property owner at Second Avenue at the Beach, and also a member of the Tybee Beach Task Force representing Tybee Lights Condominiums and ask that you consider the following:

We express our concern for the additional 8' deepening of the channel and its impact on the current problems of erosion. We understand the importance of shipping needs but emphasize the problems and effect on the public beach and on private property.

If the Corp has the right of condemnation and this would result in damage, assessment of the damage and determination of the recipients should be considered.

The need for deepening and the need for renourishment are both part of the same package. The problem should be solved by a plan needed for the benefit of both problem. This would include renourishment along with placement of groins, both as required by proper engineering.

Your comments and reply will be appreciated. Full cooperation on the part of all effected should be explored and answered to achieve the needs, effect and reality involved.

Please accept this communication offered as constructive.

Yours very truly,

SIDNEY L. RASKIN

SLR / ac

cc: M.J. Yuschishin
City Council, City Manager & Assistant City Manager, Tybee Island, Georgia
Hon. Jack Kingston

Letter response

SIDNEY L. RASKIN
LAW OFFICES
RASKIN & DEBELE
114 OGLETHORPE AVE. EAST
SAVANNAH, GEORGIA 31401

June 24, 1998

1. COMMENT: Concern for the additional 8' deepening of the channel and its impact on the current problems of erosion; the problems and effect on the public beach and on private property.

RESPONSE: The potential impacts to the Tybee Island beach were evaluated. No adverse impacts to either the public beach or private property along the beach are expected to result from implementation of the proposed project.

2. COMMENT: If the Corp has the right of condemnation and this would result in damage, assessment of the damage and determination of the recipients should be considered.

RESPONSE: The potential impacts to the Tybee Island beach were evaluated. No adverse impacts to the beach are expected to result from the proposed project.

3. COMMENT: The need for deepening and the need for renourishment are both part of the same package. The problem should be solved by a plan needed for the benefit of both problems. This would include renourishment along with placement of groins, both as required by proper engineering.

RESPONSE: The potential beneficial use of channel sediments, including direct placement on Tybee Beach, was evaluated. Based on the analyses performed to date, the sediments do not appear suitable for direct placement on the beach. When more geotechnical information becomes available during CED studies, this conclusion will be reviewed. If suitable volumes of beach quality sand are found, cost estimates would be developed to see if the placement of those sediments on the beach would be economically warranted.

Mr. John R. H. Stafford

John R.H. Stafford, 720 Birchwood Road, Savannah GA 31419-2507
e-mail: JohnRHSC@aol.com
telephone: (912) 925-6727

June 17, 1998

Mr. William Bailey,
Environmental Resources Branch,
U.S. Army Corps of Engineers,
P.O. Box 889,
Savannah, GA 31402-0889

Dear Mr. Bailey:

Harbor Deepening Project

I would like to comment on the indecent haste with which the subject program is being driven ahead with insufficient discussion on many potential problems.

In particular, I am concerned about the future of the Savannah National Wildlife Refuge (SNWR) which, despite initial assurances, has not recovered from the last widening project and the effects of the tidal gate fiasco. Sport and commercial fishing has suffered a sharp decline. The SNWR comprises 5% of the tidal freshwater marshes of the whole Atlantic seaboard (and 25% of these marshes in Georgia and South Carolina). The further intrusion of salt water will result in the slow death of the Refuge. The diversity of birds (over 200 species) relying on this unique ecological system must not be ignored. It is an important stop for many freshwater-dependent species on the Atlantic flyway.

The concerns of the Coastal Heritage Society concerning the integrity of Fort Jackson have been recognized with a $14 million mitigation plan (although even this is considered by CHS to be inadequate). However no amount of financial mitigation would ever defend the SNWR.

Under the circumstances, I request that a public meeting be convened so that the various concerns can be discussed openly; additionally, the comment period must be extended. There are many separate commercial, taxpayer, historical, and environmental aspects to be considered. In particular, the projected benefit to the community must be fully discussed.

I have lived in, Savannah for over 20 years and plan to live here for the remainder of my life and will be greatly disappointed if my descendants are denied the wonderful natural resources of this area.

Sincerely,

John R.H. Stafford

Letter response

John R.H. Stafford
720 Birchwood Road
Savannah GA 31419-2507

June 17, 1998

1. COMMENT: I would like to comment on the indecent haste with which the subject program is being driven ahead with insufficient discussion on many potential problems.

RESPONSE: The EIS will be revised to include a process for performing additional studies which will address these concerns and be used to develop a final mitigation plan. The additional studies and resulting mitigation plan will be subject to a Tier II EIS.

2. COMMENT: In particular, I am concerned about the future of the SNWR which, despite initial assurances, has not recovered from the last widening project and the effects of the Tidegate fiasco. Sport and commercial fishing has suffered a sharp decline. The SNWR comprises 5% of the tidal freshwater marshes of the whole Atlantic seaboard (and 25% of these marshes in Georgia and South Carolina). The further intrusion of salt water will result in the slow death of the Refuge. The diversity of birds (over 200 species) relying on this unique ecological system must not be ignored. It is an important stop for many freshwater-dependent species on the Atlantic flyway. No amount of financial mitigation would ever defend the SNWR.

RESPONSE: Section 5.7.3 of the DEIS explains that the zone of potential impact to freshwater marsh only includes the area of marsh which was previously affected by operation of the tidegate. As a result, the existing vegetation is not expected to be adversely changed.

3. COMMENT: The concerns of the Coastal Heritage Society concerning the integrity of Fort Jackson have been recognized with a $14 million mitigation plan (although even this is considered by CHS to be inadequate).

RESPONSE: The proposed project was revised in the final study documents to include sheet pile protection of the entire length of the fort structure along the river shoreline.

4. COMMENT: Under the circumstances, I request that a public meeting be convened so that the various concerns can be discussed openly.

RESPONSE: GPA has been meeting with individual groups and agencies during the Public Comment period, and plans to hold public information meetings and hearings during the CED phase as part of the preparation of the Tier II EIS.

5. COMMENT: I request that the comment period must be extended. There are many separate commercial, taxpayer, historical, and environmental aspects to be considered. In particular, the projected benefit to the community must be fully discussed.

RESPONSE: Savannah District extended the comment period until July 7, 1998 to allow other potentially affected parties to make their views known.

Mr. Greg Starbuck

VIA E-mail from ogstar@ix.netcom

Date: July 6, 1998

TO: William Bailey

SUBJECT: Harbor Deepening Project

Dear Sir-

This is to voice my opinion of this project. It may be a necessary project, but historical treasures like Old Fort Jackson must be preserved. The plan currently does not incorporate enough protection for the walls of this fort from the effects of this project. The entire fort wall exposed to the river must be protected.

Thank You,

Greg Starbuck
P.O. Box 30948
Savannah, GA 31410

Letter response

Mr. Greg Starbuck
P.O. Box 30948
Savannah, GA 31410

Date: July 6, 1998

COMMENT: This is may be a necessary project, but historical treasures like Old Fort Jackson must be preserved. The plan currently does not incorporate enough protection for the walls of this fort from the effects of this project. The entire fort wall exposed to the river must be protected.

RESPONSE: The proposed project was revised in the final study documents to include sheet pile protection of the entire length of the fort structure along the river shoreline.

Ms. Rachael A. Takei

Handwritten letter postmarked July 3, 1998

Ms. Rachael Allison Takei
30 Clarendon Road
Savannah, Georgia 31410

Mr. Bailey –

I am writing to express my opinion on the dredging issue. Although I understand that the shipping industry is vitally important to our area, I feel that the environmental concerns far outweigh the shipping concerns. Our area has already suffered so much damage in the name of commercial progress. Please put our environmental first this time.

Thank you –

Rachael A. Takei

Dicussion

Ms. Rachael Allison Takei
30 Clarendon Road
Savannah, Georgia 31410

Date: July 3, 1998

COMMENT: Although I understand that the shipping industry is vitally important to our area, I feel that the environmental concerns far outweigh the shipping concerns. Our area has already suffered so much damage in the name of commercial progress. Please put our environmental first this time.

RESPONSE: GPA is also concerned about the potential for adverse environmental effects from the proposed project. The environmental studies conducted to date, and those that will be conducted in the future, are designed to ensure that unacceptable environmental impacts would not result from implementation of a harbor improvement.

Mr. Arthur Thompson

Arthur M Thompson
4633 Sussex Place
Savannah, GA 31405-4220

June 19, 1998

Mr. Wm Bailey
Planning Division
U.S. Army Corps of Engineers
P.O. Box 889
Savannah, GA 31402

Subject: Proposed Deepening of Savannah Harbor

Dear Sir,

I wish to express my disapproval of the proposal to deepen Savannah Harbor to 50 feet. At the very least the deadline for comments should be extended so that more opinions may be considered.

The most pressing concern is the effect on the Savannah Wildlife Refuge from increased salt water intrusion. The Refuge has not yet recovered from the effect of the Tide Gate, which was supposed to be removed but hasn't been.

The next concern is the effect on the fish in the river.

I am also concerned about the effect on the natural movement of sand southward along the coast. Will Tybee's beach need more frequent renourishment?

I worry about the effect on waterfront structures along both sides of the river. I have heard concern expressed about the necessity of shoring up Fort Jackson, and I wonder how good the other structures are.

There are people who will fuss about disturbing the remains of the CSS Georgia, but I am not one of them. You have my permission to destroy that! Historic reconstruction is fine if it can be done cheaply, but not at the price of stopping economic opportunity.

I am dubious about the economic need for the deepening. The sipping people will always want to use bigger ships. What holds them back is that as ships get bigger, fewer and fewer ports can handle them. There will always be ships of the size that presently uses Savannah. It doesn't bother me if Savannah loses a few ships to Charleston or some other port. I don't believe the U.S. is going to deepen every port in the country to accommodate the bigger ships. If bigger ships get built and only a few ports can handle them, then this is going to lead to more land transport expense as trade moves toward these few ports.

Yours sincerely

Arthur M. Thompson

Letter response

Arthur M. Thompson
4633 Sussex Place
Savannah, GA 31405-4220

June 19, 1998

1. COMMENT: I wish to express my disapproval of the proposal to deepen Savannah Harbor to 50 feet. At the very least the deadline for comments should be extended so that more opinions may be considered.

RESPONSE: Savannah District extended the comment period until July 7, 1998 to allow other potentially affected parties to make their views known.

2. COMMENT: The most pressing concern is the effect on the Savannah Wildlife Refuge from increased salt water intrusion. The Refuge has not yet recovered from the effect of the Tidegate, which was supposed to be removed but hasn't been.

RESPONSE: We concur that, although the tide gate has been decommissioned, it has not yet been physically removed from the river. For a discussion of the effect of increased salinities on the refuge wetlands, please see Attachment A, Response to the Evaluation of the Ecological Report.

3. COMMENT: The next concern is the effect on the fish in the river.

RESPONSE: The EIS contains an evaluation of and documents the expected impacts of the proposed project on fishery resources.

4. COMMENT: I am also concerned about the effect on the natural movement of sand southward along the coast. Will Tybee's beach need more frequent renourishment.

RESPONSE: The potential impacts to the Tybee Island beach were evaluated. No adverse impacts to either the public beach or private property along the beach are expected to result from implementation of the proposed project.

5. COMMENT: I worry about the effect on waterfront structures along both sides of the river. I have heard concern expressed about the necessity of shoring up Fort Jackson, and I wonder how good the other structures are.

RESPONSE: An evaluation was performed that identified areas of the shoreline that were likely to be affected by the proposed construction. All structures that could be directly affected by the construction are identified in the study reports.

6. COMMENT: There are people who will fuss about disturbing the remains of the CSS Georgia, but I am not one of them. You have my permission to destroy that! Historic reconstruction is fine if it can be done cheaply, but not at the price of stopping economic opportunity.

RESPONSE: GPA believes that the work proposed at Fork Jackson and the CSS Georgia is appropriate to protect these historically and culturally valuable resources.

7. COMMENT: I am dubious about the economic need for the deepening. The sipping people will always want to use bigger ships. What holds them back is that as ships get bigger, fewer and fewer ports can handle them. There will always be ships of the size that presently uses Savannah. It doesn't bother me if Savannah loses a few ships to Charleston or some other port. I don't believe the U.S. is going to deepen every port in the country to accommodate the bigger ships. If bigger ships get built and only a few ports can handle them, then this is going to lead to more land transport expense as trade moves toward these few ports.

RESPONSE: The project adequately addressed the economic justification for the project.

ATTACHMENT A: RESPONSE TO THE EVALUATION OF THE ECOLOGICAL REPORT

PARAGRAPH 1

In 1997, Applied Technology and Management conducted a study to address the potential effects of channel deepening on the tidal marshes of Savannah National Wildlife refuge. One purpose of Applied Technology and Management's effort was to document existing vegetation distributions. The sampling design used was appropriate for that effort. However, the coverage of the sampling transects was limited to the marsh perimeter along the main channels and did not appear to include the marsh interior (around secondary channels). Because the sampling technique differed from that used in the 1986-88 sampling effort, comparisons of particular sample sites can not be directly made, although trends can be compared. An effort should have been made to re-sample the 1986-88 sites to document this relationship and to include more of the marsh interior in their sampling.

RESPONSE TO PARAGRAPH 1 OF THE EVALUATION OF THE ECOLOGICAL STUDY

ATM attempted as much as possible to duplicate the sampling regime employed in the 1986-1988 study. Quadrats 8, 4, 3,and 2 were placed within the areas corresponding to Sites 1, 2, 3,and 4, respectively, locations of the 1986-1988 study. In the Pearlstine *et al.* (1990) study, no Loran coordinates were given indicating field locations of their plots. ATM quadrat placement was as close as possible to areas indicated on maps within their report. Each ATM quadrat ran perpendicular to the Main Back River channel and theoretically crossed two of the 1986-1988 transect locations in a perpendicular fashion. In fact, in most of these locations, we could still see old quadrat markers. We could not establish quadrats at all interior locations for several reasons. First, the ATM study included 6 additional areas on the Middle and Front Rivers. Each quadrat was between 500 and 600 feet long and the total quantitative sample area of each quadrat was 21 times greater than the area sampled in all six linear transect areas employed in the 1986-1988 study. In addition, most of the quantitative data from the six transects (18 plots) in the 1986-198 study were combined into a single site format presentation especially for species composition and population structure calculations. For the purposes of the present study, the sampling regime was considered accurate, especially since (a) SPOT images were used to compare signatures of these interior areas, and (b) analysis of several qualitative vegetation plots were used to verify plant species composition.

PARAGRAPH 2

Pie charts of vegetative species and proportions found in the marsh prior to the tide gate opening (1986-88) and after gate opening (1993-94) were included in documents by Pearlstine et al. (1990) and Latham and Kitchens (1996); these documents were available to ATM. We do not understand why these data were not used in a direct sample site comparison to look at documented changes. Additionally, procedures of vegetation clustering utilized in these studies should have been followed to identify community types existing in 1997, and also to further describe the vegetation groupings in comparison to those that were used in the Pearlstine et al. (1990) satellite image classification, community descriptions, and model

predictions. If these data had been thoroughly examined, many of the conclusions drawn in the DEIS would have been different from those stated. For example, none of the methods used in the DEIS are
comparable to the assessment of Pearlstine et al. (1990) that statistically derived species groups (freshwater, intermediate, brackish, subsaline), which were then used to describe the marsh during tide gate operation, and make model predictions for marsh change. The techniques used in the DEIS are based on species abundance and richness, not species-environment relationships, which are very important in detecting change, transitions, and intermediates that might exist and suggest change is occurring.

RESPONSE TO PARAGRAPH 2 OF THE EVALUATION OF THE ECOLOGICAL STUDY

Three documents describing the historic vegetation of the SNWR were extensively reviewed by ATM and results were diligently compared with the present study. These documents are specifically listed, as follows:

1. Document 1: "Development and Application of a Habitat succession Model for the Wetland Complex of the Savannah River National Wildlife Refuge," L. Pearlstine, P. Latham, W. Kitchens, and R. Bartleson, October 1990.

2. Document 2: "Changes in Vegetation and Interstitial Salinities on the Lower Savannah River: 1986-1994," Pamela J. Latham and Wiley M. Kitchens, January 1996.

3. Document 3: "Spatial Distributions of the soft-stem bulrush, *Scirpus validus*, across a Salinity Gradient," Pamela J. Latham, Leonard G. Pearlstine, and Wiley Kitchens, *Estuaries* 14(2):192-198, June 1991.

ATM attempted to perform a more detailed comparison with the studies; however, several problems exist with interpretation of the data contained within these reports as presented. The main concerns with making comparisons to the data referenced in the above reports will be briefly discussed.

First, appendices containing raw vegetation data for these sites were not included in any of the above referenced works, and attempts to obtain these data were unsuccessful. These data were required because calculation of species importance values were inconsistent between the reports. There is no description of what is meant by "species proportions" or "proportion of plots occupied by species". In addition, none of the reports contained a comprehensive plant species list to which ATM data could be compared. ATM has presently prepared several tables (attached) to show the problems that were encountered in the attempts to make direct comparisons to the historic data.

ATM's Tables 1 through 4 compare importance values calculated from vegetation data from Pearlstine *et al.* (1990; column 1) and Latham and Kitchens (1996; columns 2 and 3) to relative frequency in the EIS (column 4). Data in column 1 were obtained from Figure 4-13 (page 75)

of Pearlstine *et al.* (1990). Data in columns 2 and 3 were taken from the "Evaluation of the Ecological Study," Table 2, which was prepared by the reviewer and summarized from Latham and Kitchens (1996), and column 4 reflects data in the EIS.

First, numerical data contained in columns 2 and 3 of these tables is not presented in the Latham and Kitchens (1996) report in any type of tabular format. These numbers were generated by the reviewer by interpolation of the relative percentage of each pie chart that each species occupies. Pie charts are contained in Figures 2 through 9, pages 7 through 10 of this report. ATM could not rely on a direct sample site comparison using data obtained in this fashion from the pie charts. The major problem with making comparisons to 1986 data was that the data contained in the reports were inconsistent. This can be seen by comparing importance value percentages contained in columns 1 and 2 of Tables 1 through 4. For example, southern wildrice (*Zizaniopsis miliacea* [Michx.] Doell & Aschers.) (Table 1) in column 1 (ATM, Table 1) equals 17 and in column 2 equals 30. These data reflect the **same** quadrat vegetation statistics and should be equal; however, differences in both relative IV and species composition exist in the two reports for the same quadrat. The total species encountered in 1986, based on column 1, equals 28, while column 2 indicates that 22 species were present. If we examine the pie chart in Figure 3 (page 7, Latham and Kitchens 1996), the total number of species indicated is 22, whereas only 12 are detailed in the pie chart. However, these 12 species are shown to contribute 100% of the variable indicated, which is assumed to be relative species importance as described in the methods. ATM could not compare the data to the present study due to the difficulty in comparing the same data presented in the two indicated reports. Finally, it must be emphasized that the standard method for presentation of plant species composition data is to derive descriptive charts, such as pie charts, from numerical (field) data and not numerical data from descriptive charts. The reviewer's approach stated in Table 2 (page 5) that the numerical values for dominant plant species "*are estimated from pie charts in the sample reports*" is problematical for purposes of comparison.

The methods of data presentation in the DEIS were matched as closely as possible to those used by Pearlstine *et al.* (1990). ATM used pie charts, Whitaker plots, geometric and linear frequency species distribution charts. The reviewer is correct in that the EIS concentrated on species abundance, composition, and richness, as well as plant population structure instead of species-environment relationships. There were several reasons for this approach. The Pearlstine *et al.* (1990) report did not contain a descriptive approach in describing the plant communities present in each of the major vegetation classes they delineated, *e.g.*, freshwater, intermediate, brackish, and subsaline. In their report, no comprehensive description is given that describes the differences in vegetation that truly differentiates these classes. This is a very important point, especially when the overlap in species among the first three groups is so dramatic. Even in the reviewer's comments there is widespread use of these class names in designating classifications of the ATM quadrats; however, there is no explanation offered for the rationale of these assignments based on plant species composition.

ATM did not concentrate on species-environmental relationships in the EIS since Pearlstine *et al.* (1990) had previously defined these relationships in their report. It was more important to accurately define the vegetation that was present in 1997 since the plant communities present are the integrated result of species interactions with the environmental parameters.

PARAGRAPH 3

The DEIS misinterprets the composition of the marsh vegetation community groups (freshwater, intermediate, brackish, subsaline), inappropriately using a very limited interpretation of what these types are. If they had compared the pie charts of their 10 sample sites with those from Pearlstine et al. (1990) (Figure 4-1.3, which documents the species composition and mean relative importance of species in the 4 marsh types) and Latham and Kitchens (1996) (Figures 2-9, which are the same sites resampled during 1993-1994 and similarly summarized) they would have recognized that the extent of the freshwater marsh had increased. Much of this change had occurred by 1993-1994, all but 3 of the 1997 sample sites could be classified as freshwater. Table 1 was compiled from the pie charts from each sampling (1986-88, 1993-94, and 1997), as a "blind" comparison, i.e. without knowledge of the sample number and location in the marsh. The marsh types are freshwater (FW), intermediate (INT), brackish (B), and subsaline (S). Species at each sample site and period are listed Table 2. Species in each vegetation class, as delineated in Pearlstine et al. (1990) from the detrended correspondence analysis and discriminant function analysis vegetation class identification and description, are listed in Table 3. These class descriptions also apply to the classes used in the model predictions. The data in the tables show that there actually has been change in vegetation composition throughout the marsh from freshwater-intermediate-brackish-subsaline to predominately freshwater (sites 1, 4-9) with an area of intermediate-freshwater mix (site 10), intermediate (site 3), and brackish (site 2) marsh. These changes were already evident in 1993-1994, when the sampled areas had changed from subsaline, brackish, freshwater/intermediate, and freshwater, to brackish/subsaline, intermediate, freshwater, and freshwater, as these classes are described in Pearlstine et al. (1990) and Table 3.

RESPONSE TO PARAGRAPH 3 OF THE EVALUATION OF THE ECOLOGICAL STUDY

Many of the concerns in this paragraph are addressed in response #2 in the previous paragraph concerning use of pie charts, mean relative importance, etc. for data comparison purposes.

The reviewer has constructed a table (Table 2; contained in Evaluation of Ecological Study document) comparing mean importance values obtained in 1986-1988 and 1993-1994 to relative frequency data obtained in the 1997 data presented in the EIS. From this data comparison, it is concluded that all but three sites would presently be classified as freshwater sites based on the change that has occurred between the sampling events. The reviewer asserts that sites 1 and 4 through 9 are freshwater. Site 10 is intermediate-freshwater mix, site 3 is intermediate, and site 2 is brackish. Based on existing all-tide salinity data, ATM generally agrees with this statement. ATM's Table 5 (attached) contains the 50th percentile salinity data (flow = 8200 cfs, all tides), sediment salinity data, and maximum salinity data found in 1997 at all quadrat locations. Based on the existing all-tides salinity data at each site, quadrat 2 is intermediate (0.5-3‰), while all other transects are freshwater (0.5‰); however, 5 quadrats are subjected to maximum salinity values that would be subsaline (7-18‰), 2 quadrats are subjected to brackish salinity levels (3-7‰), and 3 quadrats receive intermediate maximum salinity inflows (0.5-3‰).

It is interesting to note that high tide salinities (8200 cfs) at quadrat 5 are in the range of 0.75‰ whereas quadrat 7 high tide salinities exceed 1.0‰. The reviewer's assertion that quadrats 5 and 7, which show intermediate range salinities, are freshwater, pose an inconsistency with the previously described ranges for freshwater wetlands where salinities are 0 to 0.5%.

Soil salinity data indicate quadrat 2 to be subsaline, quadrats 10 and 5 to be intermediate, quadrats 3, 4, and 7 are in the intermediate to freshwater range, and quadrats 1, 6, 8, and 9 are characterized by predominately freshwater salinity concentrations. As can be seen, all quadrats are subjected to a wide range of salinity conditions. The degree to which sediment salinity, average water salinity, or ranges in salinity control vegetation distribution has not been shown in any study to date and should be considered by all future studies if the factors controlling vegetation distribution in this system are to be understood.

ATM does not agree with the <u>changes in vegetation</u> that the reviewer states have occurred. Using similarity analysis, which is the first step in any form of cluster analysis, ATM found 4 distinct groups of quadrats based on similarity. Group 1 contained quadrat 2 only, Group 2 is composed of quadrats 10, 5, 3, 4, and 7, Group 3 is composed of quadrat 1, and Group 4 contains quadrats 6, 8, and 9.

ATM, as explained in the EIS, purposely avoided classifying these communities based on salinity, in part, because of the extreme overlap in species that occurs at each site. ATM's efforts were directed toward determining the vegetation differences that occur among sites since most areas presently receive relatively low salinity inflows, characteristic of freshwater or intermediate concentrations as defined by Pearlstine *et al.* (1990); however, substantial vegetation differences exist between areas of relatively similar salinities. This is probably due to forcing functions "other than salinity" which, control vegetation within the tidal areas of the SNWR. These include substrate characteristics (which were shown to influence vegetation composition and distribution in the EIS), depth of inundation, elevation, periodicity of inundation, and tidal energy, all of which change in a gradient from upstream to downstream areas within the SNWR.

If the changes asserted by the reviewer had occurred, how do we account for the dramatic reduction in the number of species occurring between quadrats 1, 6, 8, and 9 and quadrats 4, 5, and 7, which the reviewer has classified as all freshwater associations. Species numbers in quadrat 1 equal 33, quadrat 6 equals 43, quadrat 8 equals 58, and quadrat 9 equals 36; whereas, in quadrat 4, 18 species were found, with quadrat 5 equaling 23 species and quadrat 7 equaling 18 species. This indicates that between river mile 25 and 21.5 on the Little Back River (quadrat 8 and quadrat 4), 40 species are lost and 20 species are lost between river mile 23.5 and 22.25 (quadrat 6 and quadrat 5) on the Middle River. ATM reasserts that there is a substantial difference in the plant communities located in these areas.

Table 2 (prepared by the reviewer) was prepared to enable comparison of the 1986-1988, 1993-1994, and 1997-1998 data. The difficulties with using the data in this table have been previously discussed. In addition to the obvious problems with comparing frequency data (EIS study) with relative importance values (Pearlstine *et al.* 1990), there are considerable

problems with using importance values (IV) to compare changes in plant species populations from one sample event to the other. For example, hypothetical sample IV calculations are presented in ATM Table 6. The first example represents IV calculations as described by Latham *et al.* (1991) performed on hypothetical data using density and biomass data. Importance values may change in response to several different scenarios. Examples 2 and 3 represent two types of changes that are often seen. The second example shows that, although the populations of *S. validus, S. alterniflora*, and *Z. miliacea* are the same as in the first example, the IV of these species has been reduced by 20% due to an increase in the population of *T. angustifolia*, although their respective populations have remained stable. In the third example, the importance value of 4 species, *S. validus, S. alterniflora, Z. miliacea,* and *T. angustifolia*, have been reduced by 33% due to invasion of 2 additional species, although the population of the initial 4 species is unchanged. The result is an erroneous conclusion that the populations of given species change over time if there is a change in importance value.

Importance values are a good plant community statistic indicating the contribution of a single species to the community at a given time. However, IV is not a reliable statistic to use to compare the change in the species' population from one event to the other. This simple example was given because the argument has been asserted that reduction or increases in IV's of species from the 1986-1988 event to the 1993-1994 event is a basis for reclassification of these habitats. In addition, all vegetation changes to date have been attributed to changes in salinity although several other factors (previously described) could also cause these subtle changes. No consideration is given to random differences in plots that could have occurred (especially in light of the use of the small 0.25 m^2 circular plots) or changes that could have possibly occurred due to natural succession had no salinity changes taken place. In addition, the probable contribution of feral hogs to vegetation change in the freshwater and intermediate areas has not been addressed.

Although comparison to the 1986-1988 and 1993-1994 was in part one of the tasks associated with the EIS, it was not the major purpose. The major purpose was to define the existing plant communities and assess what potential changes could occur in response to the present project. In addition, a zone where potential change would be most likely to occur was identified. It should be noted that based on the salinity classification system proposed by Pearlstine *et al.* (1990), and comparison of changes in high tide surface water salinities at 8200 cfs, no changes in the classification of plant communities at the monitoring locations will occur as a result of the project (ATM Table 7).

PARAGRAPH 4

Because the belt transect sampling technique used to sample the vegetation in 1997 is likely to encounter a greater number of species than the small, circular plots used in 1986-88 and 1993-94, comparisons based on species number and importance values should be used cautiously. The more species you encounter, the smaller each proportion must be, and the distribution approaches the lognormal (Whittaker 1965). Species dominance-diversity curves were discussed by Whittaker (1965) as a way to assess patterns of niche differentiation in a community, and are intended to represent a *range* of intergrading types. The varied forms of the curves represent relationships (such as competition) of species in communities, and they

are not necessarily exclusive. That is, they may overlap along environmental gradients, and gradual change of population densities along the gradients means the community compositions change gradually and continuously along the gradient. The result eventually is dissociations of species to escape the direct competition. With this in mind, and the fact that labeling the curves as one type or another can be subjective, the 4 resampled (in 1986-88 and 1997) quadrat curves could be labeled as follows:

Quadrat Number	Curve Type in 1986-1988	Curve Type in 1997
8	Freshwater	Freshwater
4	Intermediate	Freshwater
3	Brackish	Freshwater
4	Subsaline	Subsaline

and the other quadrats from 1997 could be labeled as:

Quadrat Number	Curve Type in 1997
1	Freshwater
5	Intermediate
6	Freshwater
7	Brackish / Intermediate
9	Freshwater
10	Intermediate

Although this does not indicate as extensive a shift in marsh types as comparing the species proportions in pie charts, it does show change has occurred to a greater extent than suggested in the DEIS Figure 40. This agrees with changes apparent on the satellite imagery classification that were not recognized in the DEIS and follows the trends suggested from the class composition comparisons in Tables 1 and 2.

RESPONSE TO PARAGRAPH 4 OF THE EVALUATION OF THE ECOLOGICAL STUDY

ATM agrees that interpretation of Whittaker plots is somewhat subjective; however, we do not agree with the rationale for relabelling the plots as presented. Based on salinity concentrations, the quadrat areas would be as asserted by the reviewer; however, based on

population structure defined by Pearlstine *et al.* (1990), there is no evidence that the population structure or species composition has changed significantly. The different curve types presented in Figures 40 and 41 correspond well with the similarity calculations presented in Figures 38 and 39 of Enclosure G of the EIS (Ecological Study). ATM's rationale is presented in detail within the report.

We agree with the reviewer in that the comparison of data between the EIS and Pearlstine *et al.* (1990) should be performed cautiously due to the differences in sampling techniques. It is important at this point to discuss some differences in the sampling regime.

ATM used an elongated quadrat that extended 500-600 feet in which vegetation was monitored continuously. Pearlstine *et al.* (1990) monitored eighteen 0.25-m^2 plots, 3 each on 6 398 ft linear transects. The total sample area in the ATM study is 21 times greater at each site than that of Pearlstine *et al.* (1990) with the total area of all 10 quadrats being about 50 times greater than that of the total area sampled by Pearlstine *et al.* (1990).

ATM sampled 6 areas on the Middle and Front Rivers that were not sampled in the previous study. Therefore no historic data exists in these areas to compare to the present data.

ATM, in the past, has found that using small plots of the type used by Pearlstine *et al.* (1990) has resulted in about one-half of the species being sampled as would be found using the elongated quadrat method. So comparison of the changes in the number of species found during the ATM EIS study with that of the Pearlstine *et al.* (1990) study cannot be accurately performed.

In Table 3, the reviewer has summarized species' relative importance values obtained in the 1986-1988 study as they relate to specific vegetation classifications. The intended purpose of this table in the review document is unclear; however,it should be noted that the relative importance values presented in the table (from Pearlstine *et al.* 1990) do not match the 1986-1988 data presented in Table 1 (prepared by the reviewer), which was taken from the Latham and Kitchens (1996) document.

PARAGRAPH 5

Additional evidence of marsh change is presented in the discussion of Species Comparisons between Different Quadrat Areas (4.10.3.4). Similarity coefficients were calculated among quadrat pairs to determine if there were general species associations across the sampled system. If the quadrats are grouped as indicated in Figure 39 (group 1=Q2; group 2=Q10, 5, 3, 4, 7; group 3=Q1; group 4=Q6,8,9) the species compositions follow the groupings for vegetation classes in Pearlstine et al. (1990) and Table 3. Thus group 1 represents a brackish community, group 2 represents a freshwater/intermediate mix community, and groups 3 and 4 represent freshwater communities. Again this represents a change from 1986-88, when these groups would have been subsaline (group 1), brackish (group 2), intermediate (group 3), and freshwater (group 4), respectively, based on the types assigned to the 1986-88 sample sites. These conclusions are further corroborated by comparisons of the classified satellite imagery from both intervals.

RESPONSE TO PARAGRAPH 5 OF THE EVALUATION OF THE ECOLOGICAL STUDY

ATM agrees with the reviewer that based on salinity data, the existing classifications of the community are as described. However, the plant communities present at each site have not changed to a degree to which would justify the reclassification of the present communities differently than that outlined by Pearlstine *et al.* (1990). The reviewer does not explain what changes occurred that would justify reclassification of these plant associations.

PARAGRAPH 6

Comparison of satellite imagery classifications also indicate the marsh has changed and continues to be in transition to a freshwater system, contrary to conclusions drawn in the DEIS. Marshes in the 1987 image classification followed a trend from subsaline to freshwater, with species proportions changing as indicated in Table 3. The succession model developed by Pearlstine et al. (1990) predicted 1987 marsh class distributions in fairly good agreement with the classified map (75%) in 1987. In the mis-classified area of the marsh (east of Argyle Island below highway 17), the system salinities represented a subsaline type, so the model classified it as such, while the standing vegetation was delineated as brackish in the image classification. The marsh vegetation communities delineated in the 1997 classification are also in fairly good agreement with model predictions of marsh community distributions following tide gate decommissioning, if the same classification groups as detailed in Table 3 are used in the 1997 effort. The freshwater marsh type predicted in the "tide gate not operating" condition of the model extends southward across most of Argyle Island and transitions to intermediate marsh south of New Cut. In the 1997 classification, if the species are similarly grouped into comparable classes as identified in Tables 2 and 3, Argyle Island to Rifle Cut is primarily freshwater marsh, from Rifle Cut south to New Cut is freshwater-intermediate mix, and from New Cut south to Highway 17 Intermediate to brackish marsh. This is a substantial change from the "tide gate operating" vegetation classification and model prediction of 1987, when freshwater marsh existed only at the north end of Argyle Island, intermediate marsh occurred from Lucknow Canal to Rifle Cut, brackish marsh covered from Rifle Cut to New Cut, and subsaline marsh existed from New Cut to the tide gate. The error in interpretation indicates the transitional and intergrading compositions of communities undergoing successional change was ignored in an effort to assign single, dominant species labels to the types.

RESPONSE TO PARAGRAPH 6 OF THE EVALUATION OF THE ECOLOGICAL STUDY

ATM made no effort to assign single dominant species labels to plant associations. In the EIS, ATM delineated 28 distinct community associations as compared to 13 associations used in the GIS mapping performed by Pearlstine *et al.* (1990). In addition, ATM documented 22 specific dominant marsh associations based on 17,458 individual observations of species frequency and cover. The vegetation map and classifications were generated directly from species cover and frequency data obtained along 5,100 ft of elongated quadrat and 52 plots where cover was ascertained. Classifications used by ATM quite often incorporate four species names that were dominant or co-dominant in a given area.

Pearlstine *et al.* (1990) used 3 different community classifications for the GIS mapping, Decorana Analysis and for generating the prediction model. These are summarized in ATM's Table 8. It is unclear as to the true relationship between all classes used, since no individual species coverage data is given for any classification. In addition, neither the predictive model classification nor the Decorana classification contain an intermediate-brackish classification in which *Typha angustifolia* is co-dominant. The dominance of *T. angustifolia* in these plots is clearly illustrated in Figure 4-1.3 (page 75) of the Pearlstine *et al.* (1990) report. The model, as generated by Pearlstine *et al.* (1990) predicted that the *Eleocharis* / Freshwater Mix marsh would expand to approximately the 18.5 mile marker of Back River.. This change in vegetation was predicted to occur within 2 years after removal of the tide gate. This clearly has not happened and ATM explained in detail in the EIS why the expansion of this community type is improbable. The model, as generated in 1986-1988, did not address the scenario of the closure of New Cut or the 1993-1994 channel deepening. Both these events have occurred since their study, which is why the limit of existing freshwater conditions has been located at Rifle Cut near the 21 mile marker.

PARAGRAPH 7

It is unclear from the documentation just how the classification comparison was done and just what would constitute "dramatic change" in the marsh. A one-to-one raster or grid-cell based comparison could have been made between the marsh classifications (with and without the tide gate) and the model predictions (with and without the tide gate) using maps coded with the same classification schemes (such as that outlined in Table 3; this is possible since both time periods included common marsh types in the classifications). A difference or disagreement map indicating change in type could have been produced which would illustrate the changes discussed above that are recognizable in a visual comparison of the maps and model output. The method should be documented, as well as a more-detailed discussion of the classification procedures and a classification accuracy assessment. The later is particularly important, given the transitional nature of the marshes, which ATM recognized was complicating the classification effort.

RESPONSE TO PARAGRAPH 7 OF THE EVALUATION OF THE ECOLOGICAL STUDY

Pearlstine et al. (1990) include a table (Table 3-2) in their report that provides some useful data for comparing the vegetative composition of the marsh in 1987 with the current (i.e., 1997) vegetative conditions. This table provides a listing of field observations of vegetation at 58 locations within the study area marshes. These observations were used by Pearlstine et al. (1990) to assess the accuracy of their satellite image classification. The listing includes the latitude-longitude coordinates of each observation point and a note on what dominant plant assemblage was noted at that location. ATM entered these latitude-longitude coordinates into a GIS and the resulting points were overlaid on the wetland classification map included in the DEIS (see Figure 44 of the Ecological Study – *Classified SPOT image of the SNWR showing delineation of major plant associations).* Pearlstine et al.'s (1990) 1987 vegetation observations were then compared to the 1997 vegetation classification developed for the Ecological Study. The results of this comparison are presented in Table 9.

Since Pearlstine et al. (1990) conducted their study in 1987 they did not have the benefit of GPS technology which would not become available for several more years. Accordingly, they determined their observation point positions using LORAN; with which they estimated their positional accuracy to be approximately 30 meters in any direction.

Because the positional accuracy of the LORAN coordinates is approximately 30 meters, comparisons were done using the pixel on the vegetation classification map that the LORAN point was located in, as well as in each surrounding adjacent pixel. The vegetation classification map is derived from a SPOT satellite image and the pixel size is approximately 20 meters. Each of the different vegetation associations of the 1997 classification that occurred within one pixel of the LORAN point were entered into the table. The 1987 field observations and the 1997 classification were considered to match if the vegetation noted in the 1987 field observation matched either of the first two dominant vegetation types represented in any of the pixels. Because of the positional accuracy of the LORAN points, several were located in areas classified as open water and were noted as such along with the closest vegetation association. Of the 58 total field observations noted in 1987, 52 (88 percent) were consistent with the vegetation classification determined in the 1997 study.

Further studies should include a comprehensive accuracy assessment of the classified satellite image as well as a change detection study that utilizes archival SPOT and Landsat MSS satellite imagery.

GENERAL COMMENTS

Most reviewer's comments on the plant community section of the DEIS have referenced the work of Pearlstine *et al.* (1990) and Latham and Kitchens (1996). The reviewer's and these studies indicate a change in the freshwater habitat since the removal of the tide gate. However, no one has described in detail exactly what this change is.

Reviewers have also commented that the ATM study claims that no change has occurred in the vegetation since the removal of the tide gate. This is not the case. In the study, we noted the change in distribution of several species, primarily *Bidens laevis* [L.] BSP. and *Typha angustifolia* L. The change in the populations of *B. laevis* is most evident in the marshes adjacent to the Front and Middle Rivers.

The change in *T. angustifolia* is most evident below Port Wentworth in the marshes that border the Back River. ATM specifically noted that the greatest change in aerial photos appears to be related to an increase in the population of *T. angustifolia* throughout the Refuge. ATM also indicated that this species is the one to watch in the future. This change in the population of *T. angustifolia* was not addressed or predicted in the Pearlstine *et al.* (1990) model or the model classification schemes or descriptions.

In the *DEIS*, ATM stated that "a wide-spread change in the distribution of the freshwater marsh system as defined by <u>species diversity</u> and <u>population structure</u> (not *in-situ* salinity) has not occurred to date." This conclusion was derived from extensive field data and tabulations of that data using standard quantitative techniques. What the data show is that the areal change predicted in the extent of the *Eleocharis* / Freshwater marsh, as described by

Pearlstine *et al.* (1990), has not occurred and no information has been presented to date to support the claim that this change has occurred.

ATM Table 1. Comparison of species Importance Values calculated for Site 1--Freshwater Site (ATM quadrat 8).

Species Name	86*	86†	94†	97-98‡
Zizaniopsis miliacea (Michx.) Doell & Aschers.	17	30	15	11.62
Typha latifolia L.	4	2	—	—
Scirpus validus Vahl	12	10	15	0.23
Salix caroliniana Michx.	8	3	—	—
Pontederia cordata L.	—	2	—	—
Leersia species	7	<1	—	—
Mikania scandens (L.) Willd.	—	<1	5	0.38
Polygonum species	3	2	10	1.96
Galium tinctorium L.	3	2	—	2.04
Eleocharis quadrangulata (Michx.) Roem. & J. A. Schultes	6	2	1	—
Eleocharis montevidensis Kunth (*fallax*)	11	25	15	12.20
Aster tenuifolius L.	—	10	1	—
Murdannia keisak (Hassk.) Hand.-Mazz.	7	1	—	6.62
Typha angustifolia L.	—	—	5	0.04
Sagittaria lancifolia L.	3.0	—	25	0.08
Osmunda species	—	—	7	1.19
Aster elliottii Torr. & Gray	4.0	—	—	5.00
Scirpus robustus Pursh	3.0	—	—	—
15 species	12	—	—	—
9 species	—	10	—	—
12 species	—	—	?	—
47 species	—	—	—	65.60
TOTAL NUMBER OF SPECIES	28	22	12?	58

*Pearlstine *et al.* 1990
†Latham and Kitchens 1996
‡ATM EIS

ATM Table 2. Comparison of species Importance Values calculated for Site 2--Intermediate site (ATM quadrat 4).

Species Name	86*	86†	94†	97-98‡
Scirpus validus Vahl	29	15	20	19.34
Sagittaria lancifolia L.	2	25	2	0.06
Polygonum species	3	10	15	19.89
Zizaniopsis miliacea (Michx.) Doell & Aschers.	19	15	20	24.57
Typha angustifolia L.	22	5	2	—
Eleocharis montevidensis Kunth	20	15	10	9.20
Osmunda species	—	10	—	—
Eleocharis quadrangulata (Michx.) Roem. & J. A. Schultes	—	<1	2	1.43
Aster tenuifolius L.	—	1	—	0.17
Mikania scandens (L.) Willd.	—	5	5	—
Typha latifolia L.	—	—	<1	—
Scirpus robustus Pursh	—	—	2	—
Salix caroliniana Michx.	—	—	15	—
Sagittaria latifolia Willd.	—	—	2	—
Hydrocotyle umbellata L.	—	—	5	—
Galium tinctorium L.	—	—	<1	—
Aster elliottii Torr. & Gray	—	—	—	10.30
Bidens laevis (L.) BSP.	—	—	—	8.60
Panicum hemitomon Schult.	—	—	—	2.98
Eleocharis cellulosa Torr.	—	—	—	1.87
Pluchea odorata (L.) Cass.	—	—	—	0.66
Cyperus strigosus L.	—	—	—	0.22
Amaranthus cannabinus (L.) Sauer	—	—	—	0.17
Pontederia cordata L.	—	—	—	0.17
Spartina cynosuroides (L.) Roth	—	—	—	0.17
3 species	5	—	—	—
2 species	—	—	—	0.22
TOTAL NUMBER OF SPECIES	9	10	14	18

*Pearlstine *et al.* 1990
†Latham and Kitchens 1996
‡ATM EIS

ATM Table 3. Comparison of species Importance Values calculated for Site 3--Brackish site (ATM quadrat 3).

Species Name	86*	86†	94†	97-98‡
Scirpus validus Vahl	37	50	35	38.92
Scirpus robustus Pursh	—	10	—	—
Spartina alterniflora Loiseleur	—	15	5	8.14
Typha angustifolia L.	37	10	5	0.83
Zizaniopsis miliacea (Michx.) Doell & Aschers.	17	10	25	13.32
Eleocharis montevidensis Kunth	—	5	—	1.79
Aster tenuifolius L.	—	—	15	—
Polygonum species	—	—	<1	6.21
Sagittaria lancifolia L.	6	—	10	7.38
Sagittaria latifolia Willd.	—	—	5	—
Eleocharis cellulosa Torr.	—	—	—	7.04
Scirpus pungens Vahl.	—	—	—	5.24
Bidens laevis (L.) BSP.	—	—	—	4.55
Spartina cynosuroides (L.) Roth	—	—	—	2.00
Pluchea odorata (L.) Cass.	—	—	—	1.10
Amaranthus cannabinus (L.) Sauer	—	—	—	0.76
Pluchea rosea Godfrey	—	—	—	0.69
Lilaeopsis chinensis (L.) Kuntze	—	—	—	0.69
7 species	—	—	—	1.33
4 species	3	—	—	—
TOTAL NUMBER OF SPECIES	8	6	8	22

*Pearlstine *et al.* 1990
†Latham and Kitchens 1996
‡ATM EIS

ATM Table 4. Comparison of species Importance Values calculated for Site 4--Subsaline site (ATM quadrat 4).

Species Name	86*	86†	94†	97-98‡
Spartina alterniflora Loiseleur	38	50	20	16.82
Scirpus validus Vahl	23	30	40	18.74
Spartina cynosuroides (L.) Roth	4	10	5	7.45
Scirpus robustus Pursh	30	10	10	20.6
Typha angustifolia L.	—	<1	10	25.35
Zizaniopsis miliacea (Michx.) Doell & Aschers.	—	—	15	—
Aster tenuifolius L.	—	—	—	10.85
Pluchea odorata (L.) Cass.	—	—	—	0.19
2 species	4	—	—	—
TOTAL NUMBER OF SPECIES	6	5	6	7

*Pearlstine *et al.* 1990
†Latham and Kitchens 1996
‡ATM EIS

ATM Table 5. Comparison of salinity classifications for each of the 10 quadrat areas.

		Existing 50th Percentile 8200 cfs, All tides	Classification	1997 Sediment Salinity	Classification	Existing Maximum Surface Salinity	Classification
Group 1	Q2	2.01	Intermediate	4.0-6.4	Subsaline >10		Subsaline
Group 2	Q10	0.50	Freshwater	0.6-1.6	Intermediate	10	Subsaline
	Q5	0.42	Freshwater	0.7-1.7	Intermediate	7.5	Subsaline
	Q3	0.35	Freshwater	0.2-2.0	Freshwater-Int	3.0	Int-Brackish
	Q4	0.26	Freshwater	0.0-0.2	Freshwater	1.5	Intermediate
	Q7	0.30	Freshwater	0.1-1.0	Freshwater-Int	10	Subsaline
Group 3	Q1	0.11	Freshwater	0.1-0.8	Freshwater-Int	7.0	Subsaline
Group 4	Q6	0.25	Freshwater	0.2-0.4	Freshwater	5.5	Brackish
	Q8	0.18	Freshwater	0.0-0.2	Freshwater	0.6	Intermediate
	Q9	0.10	Freshwater	0.0-0.0	Freshwater	2.5	Intermediate

Classification System of Pearlstine *et al.* (1990)

Freshwater	0.0-0.5 ppt
Intermediate	0.5-3.0 ppt
Brackish	3.0-7.0 ppt
Subsaline	7.0-18.0 ppt

ATM Table 6. Example of IV calculations and hypothetical changes that can occur in IV's.

	Density # / m2	Biomass g / m2	Relative Density (%)	Relative Biomass (%)	Importance Value
IST EXAMPLE					
Scirpus validus Vahl	100	100	0.25	0.25	0.5 or 50
Spartina alterniflora Loiseleur	100	100	0.25	0.25	0.5 or 50
Zizaniopsis miliacea (Michx.) Doell & Aschers.	100	100	0.25	0.25	0.5 or 50
Typha angustifolia L.	100	100	0.25	0.25	0.5 or 50
TOTAL	400	400	1.00	1.00	2.00 or 200
SECOND EXAMPLE: CHANGE IN DOMINANCE OF SINGLE SPECIES					
Scirpus validus Vahl	100	100	0.20	0.20	0.4 or 40
Spartina alterniflora Loiseleur	100	100	0.20	0.20	0.4 or 40
Zizaniopsis miliacea (Michx.) Doell & Aschers.	100	100	0.20	0.20	0.4 or 40
Typha angustifolia L.	200	200	0.40	0.40	0.8 or 80
TOTAL	500	500	1.00	1.00	2.00 or 200
THIRD EXAMPLE: RECRUITMENT OF 2 ADDITIONAL SPECIES					
Scirpus validus Vahl	100	100	.167	.167	.334 or 33.4
Spartina alterniflora Loiseleur	100	100	.167	.167	.334 or 33.4
Zizaniopsis miliacea (Michx.) Doell & Aschers.	100	100	.167	.167	.334 or 33.4
Typha angustifolia L.	100	100	.167	.167	.334 or 33.4
Bidens laevis (L.) BSP.	100	100	.167	.167	.334 or 33.4
Polygonum punctatum Ell.	100	100	.167	.167	.334 or 33.4
TOTAL	600	600	1.00	1.00	2.00 or 200

ATM Table 7. 50th percentile high tide surface salinities (‰) and corresponding habitat classifications based on Pearlstine *et al.* (1990) classification system (8200 cfs).

	Existing		Projected		
Station	Salinity	Vegetation Class	Salinity	Vegetation Class	Change
GPA-06	5.4	Brackish	5.6	Brackish	No
GPA-08	1.7	Intermediate	2.3	Intermediate	No
GPA-09	1.1	Intermediate	1.7	Intermediate	No
GPA-11	0.0	Freshwater	0.3	Freshwater	No
GPA-14	0.0	Freshwater	0.0	Freshwater	No
GPA-10	1.0	Intermediate	1.6	Intermediate	No
GPA-12	0.3	Freshwater	0.5	Freshwater	No
GPA-05	7.9	Subsaline	8.4	Subsaline	No
GPA-07	2.5	Intermediate	2.7	Intermediate	No
GPA-15	0.8	Intermediate	0.7	Intermediate	No
USF&W	0.1	Freshwater	0.0	Freshwater	No
LUCK-N	0.0	Freshwater	0.0	Freshwater	No
GPA-13	0.1	Freshwater	0.0	Freshwater	No

ATM Table 8. Three Nomenclature Schemes For Classification used by Pearlstine *et al.* (1990).

GIS MAPPING

1. Cypress-Tupelo
2. Bottomland Hardwoods
3. Upland Forested
4. Upland Non-Forested
5. Fresh-Marsh Mix
6. *Zizaniopsis*
7. *Zizaniopsis-Scirpus*
8. *Zizaniopsis*-Shrub
9. *Typha-Zizaniopsis-Scirpus*
10. *Scirpus validus*
11. *Scirpus-Spartina*
12. *Spartina alterniflora*
13. *Spartina cynosuroides*

DECORANA ORDINATION-Vegetation Sheets (4 combined sites)

1. *Eleocharis montevidensis*
2. *Eleocharis montevidensis* & *Scirpus validus*
3. *Zizaniopsis miliacea, Scirpus validus, Typha angustifolia*
4. *Zizaniopsis miliacea*
5. *Eleocharis montevidensis, Scirpus validus, Zizaniopsis miliacea*
6. *Scirpus validus-Zizaniopsis miliacea*
7. *Scirpus validus*
8. *Spartina alterniflora-Scirpus validus*
9. *Spartina alterniflora-Scirpus robustus*

PREDICTION MODEL CLASSES

Freshwater

1. *Eleocharis*
2. *Eleocharis*/Freshwater Mix
3. *Zizaniopsis*
4. *Zizaniopsis*/Freshwater Mix

Intermediate

5. *Eleocharis* Mix
6. *Scirpus validus*
7. *Zizaniopsis*

Brackish

8. *Scirpus validus*
9. *Scirpus validus/Zizaniopsis*

Subsaline

10. *Spartina/Scirpus robustus*
11. *Spartina/Scirpus validus*
12. *Scirpus validus*

Table 9. Comparison of 1987 field observations with 1997 vegetation classification map.

LORAN Coordinates (a) Latitude	Longitude	1987 Field Observations (a)	1997 Vegetation Classification (b)	Match
32 12 18	81 08 24	*Zizaniopsis*	*Ziz mil, Ziz mil - Ele fal - Freshwater Mix, Ele fal - Freshwater Mix*	Yes
32 11 37	81 08 14	*Zizaniopsis* / *Scirpus*	*Ziz mil, Ele fal - Freshwater Mix, Ziz mil - Ele fal*	Yes
32 11 36	81 08 04	*Eleocharis* / Fresh mix	*Ziz mil, Ziz mil - Ele fal - Freshwater Mix*	Yes
32 11 35	81 07 55	*Zizaniopsis* / *Scirpus* / *Eleocharis*	*Ziz mil, Ziz mil - Ele fal - Freshwater Mix*	Yes
32 11 34	81 07 44	Mixed fresh	*Mixed Shrubs*	No
32 11 25	81 07 33	*Eleocharis* / Fresh mix	*Ziz mil, Ziz mil - Ele fal - Freshwater Mix*	Yes
32 11 23	81 07 23	*Eleocharis* / Fresh mix	*Ele fal - Freshwater Mix, Ziz mil - Ele fal - Freshwater Mix*	Yes
32 11 08	81 07 10	Fresh mix, *Zizaniopsis* from back R. to point	*Ziz mil, Ele fal - Freshwater Mix*	Yes
32 11 04	81 07 57	*Scirpus val*., scattered *Typha*	*Ziz mil - Ele fal*	No
32 11 04	81 07 48	*Zizaniopsis* / Fresh mix	*Ziz mil, Ele fal - Freshwater Mix, Mixed Shrubs*	Yes
32 10 41	81 08 32	*Zizaniopsis* / Fresh mix	*Ziz mil - Sci val, Ziz mil - Ele fal*	Yes
32 10 35	81 07 40	Fresh mix	*Ziz mil - Ele fal*	Yes
32 10 35	81 07 27	*Eleocharis* / Fresh mix	*Ziz mil - Ele fal, Ziz mil - Sci val, Ziz mil - Sci val - Pol pun - Ast ell - Bid lae*	Yes
32 10 34	81 08 37	*Zizaniopsis*	*Open Water, Sci val - Ziz mil - Pol pun - Bid lae*	Yes
32 10 34	81 08 04	*Scirpus* / *Typha* / *Eleocharis*	*Ziz mil - Sci val, Ele fal - Sci val*	Yes
32 10 34	81 07 17	*Zizaniopsis*	*Ziz mil - Ele fal, Ziz mil - Sci val, Ziz mil - Sci val - Pol pun - Ast ell - Bid lae, Cypress - Nyssa Swamp*	Yes
32 10 30	81 07 52	*Scirpus* / *Typha*	*Ziz mil - Ele fal*	Yes
32 10 29	81 08 10	*Zizaniopsis*	*Ziz mil - Sci val, Ziz mil - Ele fal,Ele fal - Sci val*	No
32 10 23	81 07 32	*Scirpus*	*Ziz mil - Ele fal, Ziz mil - Sci val, Ziz mil - Sci val - Pol pun - Ast ell - Bid lae*	Yes
32 10 22	81 07 43	*Scirpus v.* / mixed *Zizaniopsis*	*Ziz mil - Ele fal, Ele fal - Freshwater Mix, Ziz mil - Sci val - Pol pun - Ast ell - Bid lae*	Yes
32 10 22	81 07 23	*Typha, Scirpus, Zizaniopsis*	*Open Water, Ziz mil - Sci val*	Yes
32 09 46	81 07 04	*Scirpus, Zizaniopsis*	*Sci val - Ziz mil - Pol pun - Bid lae, Bid lae - Pol pun - Ast ell - Ziz mil - Sci val*	Yes
32 09 45	81 07 45	*Scirpus*	*Sci val - Ziz mil - Sci pun - Ele sp., Sci val - Ziz mil - Pol pun - Bid lae*	Yes
32 09 45	81 06 55	Mixed *Zizaniopsis, Scirpus*	*Bid lae - Pol pun - Ast ell - Ziz mil - Sci val*	Yes
32 09 44	81 07 16	*Typha* / *Scirpus* / *Zizaniopsis*	*Sci val - Ziz mil - Pol pun - Bid lae*	Yes
32 09 37	81 06 54	*Zizaniopsis*	*Bid lae - Pol pun - Ast ell - Ziz mil - Sci val, Sci val - Ziz mil - Pol pun - Bid lae*	Yes
32 09 36	81 07 05	*Zizaniopsis*, *Typha*	*Sci val - Ziz mil - Pol pun - Bid lae*	Yes
32 09 34	81 07 16	*Scirpus r.* / *Spartina alt.*	*Sci val - Ziz mil - Sci pun - Ele sp., Sci val - Ziz mil - Pol pun - Bid lae*	No
32 09 29	81 07 35	*Scirpus*	*Sci val - Ziz mil - Pol pun - Bid lae, Sci val - Ziz mil - Sci pun - Ele sp., Bid*	Yes

Table 9. Comparison of 1987 field observations with 1997 vegetation classification map.

LORAN Coordinates (a) Latitude	Longitude	1987 Field Observations (a)	1997 Vegetation Classification (b)	Match
			lae - Pol pun - Ast ell - Ziz mil - Sci val	
32 09 29	81 07 24	*Spartina alt.* on edge, *Scirpus* at point	*Open Water, Exposed Mud, Sci val - Ziz mil - Sci pun - Ele sp.*	Yes
32 09 27	81 07 53	*Scirpus*	*Bid lae - Pol pun - Ast ell - Ziz mil - Sci val, Sci val - Ziz mil - Pol pun - Bid lae*	Yes
32 09 14	81 07 43	*Scirpus / Zizaniopsis*	*Sci val- Ziz mil - Sci pun - Ele sp., Sci val - Ziz mil - Pol pun - Bid lae*	Yes
32 09 14	81 07 02	*Typha*, *Scirpus r. / Spartina*	*Sci val - Ziz mil - Sci pun - Ele sp., Sci val*	No
32 09 13	81 07 56	*Scirpus*	*Bid lae - Pol pun - Ast ell - Ziz mil - Sci val, Sci val - Ziz mil - Pol pun - Bid lae, Sci val - Ziz mil - Sci pun - Ele sp.*	Yes
32 09 13	81 07 34	*Scirpus / Zizaniopsis*	*Sci val- Ziz mil - Sci pun - Ele sp., Sci val*	Yes
32 09 13	81 07 23	*Scirpus / Zizaniopsis*	*Sci val- Ziz mil - Sci pun - Ele sp., Sci val, Sci val - Ziz mil - Pol pun - Bid lae*	Yes
32 09 13	81 06 50	*Scirpus*	*Sci val - Ziz mil - Sci pun - Ele sp.*	Yes
32 09 11	81 07 38	*Scirpus*	*Sci val, Sci val - Ziz mil - Sci pun - Ele sp.*	Yes
32 09 08	81 07 22	*Scirpus*	*Sci val, Sci val - Ziz mil - Sci pun - Ele sp.*	Yes
32 08 56	81 07 53	*Zizaniopsis* at edge, *Scirpus* w/ *Zizanioposis* at point	*Open Water*	No
32 08 40	81 07 39	*Scirpus, Zizaniopsis*	*Bid lae - Pol pun - Ast ell - Ziz mil - Sci val, Sci val - Ziz mil - Pol pun - Bid lae*	Yes
32 08 40	81 07 29	*Scirpus, Zizaniopsis*	*Sci val - Ziz mil - Sci pun - Ele sp., Sci val - Ziz mil - Pol pun - Bid lae*	Yes
32 08 40	81 07 19	*Scirpus*	*Sci val - Ziz mil - Sci pun - Ele sp.*	Yes
32 08 40	81 06 53	*Scirpus*	*Typ ang - Sci rob - Spa alt - Sci val, Sci val - Sci rob - Spa alt - Ast ten*	Yes
32 08 25	81 06 35	*Spartina alt.* and *Scirpus r.*	*Typ ang - Sci rob - Spa alt - Sci val, Spa cyn - Spa alt - Typ ang - Sci val*	Yes
32 08 24	81 06 55	*Scirpus v.* and *Scirpus r.*	*Sci val - Sci rob - Spa alt - Ast ten, Typ ang - Sci rob - Spa alt - Sci val*	Yes
32 08 21	81 07 18	*Scirpus*, *Typha*, annuals	*Sci val - Sci rob - Spa alt - Ast ten*	Yes
32 08 13	81 07 13	*Scirpus*	*Sci val - Sci rob - Spa alt - Ast ten, Typ ang - Sci rob - Spa alt - Sci val*	Yes
32 07 52	81 06 10	*Scirpus v.* and *r. / Spartina alt.*	*Sci val - Sci rob - Spa alt - Ast ten, Typ ang - Sci rob - Spa alt - Sci val*	Yes
32 07 51	81 06 21	*Scirpus*	*Typ ang - Sci rob - Spa alt - Sci val, Spa cyn - Spa alt - Typ ang - Sci val, Sci val - Sci rob - Spa alt - Ast ten*	Yes
32 07 50	81 06 31	*Scirpus v.* to north / *Scirpus, Spartina* to the south	*Sci val - Sci rob - Spa alt - Ast ten*	Yes
32 07 36	81 07 05	*Spartina alt.*	*Typ ang - Ziz mil, Ziz mil - Sci val, Spa alt*	Yes
32 07 13	81 06 16	*Scirpus* v. / *Spartina alt.*	*Spa cyn - Spa alt - Typ ang - Sci val, Typ ang - Sci rob - Spa alt - Sci val*	Yes
32 07 12	81 06 52	*Scirpus r. / Spartina alt.*	*Typ ang - Sci rob - Spa alt - Sci val, Sci val - Sci rob - Spa alt - Ast ten*	Yes

Table 9. Comparison of 1987 field observations with 1997 vegetation classification map.

LORAN Coordinates (a)						1987 Field Observations (a)	1997 Vegetation Classification (b)	Match
Latitude			Longitude					
32	07	11	81	06	26	*Scirpus r. / Spartina alt.*	*Sci val - Sci rob - Spa alt - Ast ten, Typ ang - Sci rob - Spa alt - Sci val, Typ ang - Spa cyn*	Yes
32	07	09	81	06	39	*Scirpus r. / Spartina alt.*	*Typ ang - Sci rob - Spa alt - Sci val, Sci val - Sci rob - Spa alt - Ast ten, Spa cyn - Spa alt - Typ ang - Sci val*	Yes
32	06	33	81	06	12	*Spartina alt.*	*Open Water, Exposed Mud, Sci val - Sci rob - Spa alt - Ast ten*	Yes
32	06	33	81	05	59	*Spartina alt.*	*Typ ang - Spa cyn, Typ ang - Sci rob - Spa alt - Sci val, Sci val - Sci rob - Spa alt – Ast ten*	Yes

Notes:
(a) Coordinates and field observations from Table 3-2 of Pearlstine et al. (1990)
(b) Vegetation classifications from 1997 mapping conducted by ATM. Different vegetation associations noted within one pixel of the LORAN point are separated by commas.

Total Comparisons	58
Total Non-Matches	6
Total Matches	52
Percent Matching	88