APPENDIX H
COMMENTS TO THE REFORMULATION REPORT AND USIBWC RESPONSES

September 12, 2003

Slyvia Waggoner
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Dear Slyvia:

I want to extend my sincere appreciation for IBWC's willingness to meet the other week and discuss stakeholders' concerns with the current hydrological analyses underlying the Canalization EIS processes.

This past week I have reviewed the Reformulation report and need some points clarified to enhance WWF's understanding of the restoration measures that are being proposed.

I acknowledge that the questions are lengthy and may require a substantial dedication of time on the part of IBWC or Parsons' staff to answer. The additional information provided by these answers will be instrumental in helping WWF and the environmental community at large be a well-informed participant in the EIS process and improve our accuracy in communications on proposed alternatives. Because IBWC staff time may be limited, we understand if a response is not immediately forthcoming. I would be happy to discuss a reasonable time frame for a response with you.

If it would be more efficient for me to talk directly with Parsons' staff, please refer me to the individual to whom I may direct my questions. Also, if my questions are unclear, I would be happy to clarify them in person or by phone.

Below are my questions:

1. What is the correct number of acreage for planting sites within the ROW for Integrated Land Management Alternative? Table 2-4 indicates 149 acres under Integrated Land Management, 141 acres under Targeted River Restoration, Table 4-9 indicates 217 under Integrated Land Management Alternative but 189 under the Targeted River Restoration and the text indicates 223 acres (2-8).

2. What was the basis for reducing the acreage for expanded remnant bosque/riparian veg from 249 to 3 acres in the Integrated Land Management Alternative? (See Table 2-4)

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Were they outside the limits of the hydrologic flood plain, outside the ROW or did they result in "relatively" high water consumption?

3. Did Parsons prepare tables in the Reformulation report that breaks down environmental enhancement sites into acreage distribution by physiognomic class and geographic distribution by management unit (see for comparison Table 2.8 in AFR)? The reason I ask is while Parsons claims to have retained the majority of the 48 locations it is difficult to compare where they have been modified and in what respect given the information provided in the Reformulation report.

4. In Integrated Land Management Alternative, what model was used to predict how much acreage would be inundated under reference flows, see discussion 2-7 to 2-8? Which reference flow was the basis for predicting the limits of the hydrologic flood plain? Where in the report can I find the data/evaluation that supports the estimate? Is it also in the handout in the October 22, 2001 presentation (Appendix D)?

5. I wanted to verify whether the additional recreational acres within ROW identified as an environmental enhancement under Integrated land management was limited to 14 acres or 14 sites of unknown acreage? If 14 sites, where are those sites located, what type of recreational use is proposed and how much acreage would be included in each site?

6. What percentage of IBWC lands is currently under lease as recreational areas and can you provide me the name of leaseholders and locations by River Unit?

7. In Integrated Land Management Alternative, what activities are included in the "emphasis on water conservation" (2-8)?

8. Under enhancements by seasonal peak flow, the report states that the "discharge would be a combination of coordinated irrigation deliveries and additional releases from purchase of water rights" (2-8). What is the amount of discharge? What percentage of that would have to come from purchase of water rights?

9. On what basis were "artificial wetlands" deemed unsustainable in this semi-arid region given several managed wetland areas in Socorro (Bosque del Apache NWR), Las Cruces (Picacho Wetland), and El Paso (Rio Bosque and Feather Lake) and their relatively high habitat value? (2-11)

10. What exact measures are being proposed under Land Management restoration measure of modified grassland management? Specifically,

    a. what modifications would occur to the mowing regime,

    b. what types of native grasses are being considered, what percentage of ROW would be planted with native grasses and how would the native grasses be planted and established?

    c. What type(s) of salt cedar control would be used?

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11. Did Parsons do a WHAP (Wildlife Habitat Appraisal Procedure) analysis to determine the comparative habitat value from two revised measures in the Reformulation report: (1) discontinuation of mowing on 488 acres to managed grasslands on 1641 acres; and (2) cessation of grazing leases on 881 acres to modified grazing leases on 3552 acres?

12. Table 2-7 indicates that "no environmental measures were proposed for sites within urbanized reaches where flood control concerns were potentially significant." Please specify in what river mile are these "urban reaches" located? On what basis/analyses was a decision made that flood control concerns were potentially significant in these urban reaches? How many sites were excluded on this basis and what were the specific locations of the environmental measures in river miles?

13. Why was the amount of land easements/land acquisition reduced from 1183 acres to 999 acres (Table 2-4)?

14. Under the original Formulation report, 1062 acres w/in the ROW and 914 acres outside of ROW were identified for salt cedar control (See AFR Table 2-12). This action was identified as an "implementation action" in the Reformulation report. Are these acreage now included in the acreage count under some other restoration measure such as modified grazing lease, managed grasslands or easements? What does it mean to be called an implementation action as opposed to a "measure"?

15. What was the basis for excluding 47 acres of new meanders outside of the ROW from consideration as a restoration measure under the Targeted River Restoration?

16. What was the basis for excluding minimum in-stream flows from consideration in Targeted River Restoration alternative?

17. Under "Maintenance of Levee System", p.3-1, the report states that the slopes are mowed to prevent growth of bush and trees that could obstruct flows or cause root damage to structure itself." On what basis/analyses was the conclusion drawn that growth of bush and trees could obstruct flows or cause root damage to the structure itself?

18. Under "Mowing of Floodway", p.3-2, the report states "floodway areas outside the main channel are maintained to remove obstructions." What is the justification for removing "obstructions" and on what basis/analyses was the conclusion drawn that vegetation in the floodway could "obstruct" flows?

19. Under the Modified O&M and Flood Control alternative, the report states that modeling and absence of information on structural integrity were insufficient to accurately predict how much levee height increase and building of additional levees will be necessary, but estimates were included anyway as a "work assumption" (3-

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5). Can you explain to me what IBWC means by "work assumption?" I am having a difficult time understanding the justification for including it and then failing to complete the necessary analyses to objectively evaluate this alternative, or, alternatively, why the alternative was included at all or especially in light of the language in Section 4.3.4, "Reevaluation of flood control strategies is an ongoing task conducted by the USIBWC as part of its mission, and whose scope is beyond the evaluation of river management alternatives for the RGCP."

20. The report states (4-20) that two reaches successfully met the criteria for levee relocation. Is "levee relocation" a restoration measure incorporated in any alternative? I do not see these measures included in any of the figures detailing point projects, Figure 2-4 through 2-22 or included in Table 2-4 as a measure under the Targeted River Restoration. If levee relocation was not included in any alternative, why not, considering at least two reaches met the criteria established by Parsons?

21. The criteria for levee relocation state that "levee deficiencies adjacent to urbanized areas must be addressed by levee rehabilitation at their current location (structural measures)." How was "urbanized areas" defined? Did Parsons look at adjacent land use to the "deficient" levee in "urbanized areas? What was the justification/basis for the assumption that "levee deficiencies adjacent to urbanized areas must be addressed by levee rehabilitation at their current location (structural measures)?"

22. Are the 127 acres of bank shave-downs included in the estimate of 516 acres of floodway inundated with seasonal peak flows or are they in addition to the 516 acres under the Targeted River Restoration alternative?

23. All 127 acres of the bank shavedown restoration measures occurs in the upper and lower Rincon Valley. Table 3-4 indicates recurrence of peak daily flows during the months of March and April over the past 63 years below Caballo Dam at station 08-3625.00. On what basis was the conclusion made that peak daily flows below Caballo Dam occurred with the same frequency at river miles 104, 103, 102,101,98,94,92,83,76? In other words, was the necessary modeling completed to estimate the presence/absence of attenuation of these flows in the reach between station 08-3625.00 and the above river miles? If so, what model was used and how much attenuation was estimated?

24. What are the estimates of increase in consumptive water use for each of the restoration measures below? (On page 4-4, the report sets out two estimates but it is unclear to me which of the restoration measures below are "riparian vegetation development" and which are "planting sites.") On what basis/justification were these estimates drawn from? Further, there appear to be no estimates for salvage or depletions from seasonal flows, open water areas in reopened meanders or modified dredging at arroyos. Is it estimated that there will be no change in water use from these measures? How much water is estimated to be lost from evapotranspiration from the existing vegetation in the floodway under current management? It is critical

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to know this figure as the language on 4-4, specifies the estimates in water consumption are an "increase" over existing use and not "actual" water consumption estimates.

a. 223 acres of native vegetation planting

b. 127 acres of bank shavedowns

c. 516 acres of inundated floodway

d. 141 acres of reopened meanders (25% open water and 75% native cottonwoods)

e. modified dredging at 12 arroyos

23. The Reformulation report states that implementation of native vegetation establishment and localized changes in channel geometry are likely to require significant water acquisition (3-11). How much water does Parson's estimate these measures will consume? On what basis were these estimates computed/prepared?

24. The Reformulation report states that native vegetation establishment under the Targeted River Restoration alternative will occur as a result of controlled water releases from Caballo Dam during "high storage conditions in Elephant Butte Reservoir." (3-11) What is the definition of "high storage conditions?" Based on historical records, with what frequency will these storage conditions occur?

25. With regard to controlled water releases for overbank flooding (3-13), what are the flow values for "typical irrigation levels?"

26. What is the hydrograph for the water releases for overbank flooding, i.e., duration, magnitude, frequency and timing, and rate of change in rising and recessional limbs?

27. The report further states (3-13) that these discharges would be a combination of coordinated irrigation deliveries and additional water releases from the purchase of water rights. How many acre-feet of water does Parson's estimate would have to be purchased to achieve the projected overbank flooding? What analyses have been performed to demonstrate the feasibility of coordinating irrigation flows at desired levels during optimum cottonwood seed germination periods?

28. With regard to reopening of meanders within ROW, the report states that the structures would divert water during "high flow periods" (3-16). What is the definition of "high flow periods" and with what frequency do they occur based on historical records? What data or model was used to determine the frequency of "high flow" occurrence at river miles 105, 102, 97, 95, 92, and 54? For what duration of time and at what water levels does Parsons' estimate "backwater conditions during low flow conditions" would persist in the side channels?

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29. On what basis/criteria were arroyos identified as having the most significant potential for diversification of aquatic habitat (3-16)?

30. What role did/does IBWC play in the construction and maintenance of sediment retention dams on arroyos in the Canalization Project. The report indicates that USIBWC requested NRCS to construct sediment control dams at 4 arroyos (4-12). Can you provide more information about the nature of these requests and whether IBWC funding/in-kind services were used for their construction?

31. What is the legal basis for saying that environmental water use will require project reauthorization (4-2)?

32. Can you explain the position taken in the report that "use of non-structural flood control methods in the RGCP is primarily an economic and risk-management decision?" (4-17)

33. What role did IBWC play in the construction of Caballo Dam? Was the dam constructed, in part or whole, at the request of IBWC? Did IBWC funding/in-kind services contribute to the cost of construction?

34. What was the basis/justification for not considering reworking of the channel geometry to create low velocity habitat for aquatic habitat diversification?

35. Is it possible to get copies of the following technical reports:

    a. Technical Report, HEP and WHAP Surveys for Evaluation of Aquatic and Wildlife Habitat, Rio Grande Canalization Project, Parsons, June 2001

    b. Threatened and endangered species final report, USIBWC Rio Grande Canalization EIS, Parsons, April 2000

    c. Final Threatened and Endangered Species Survey Technical Report, Rio Grande Canalization Project, Parsons, February 2001

Yours truly,

Beth Bardwell

Program Officer

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INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

NOV 1 4 2003

Ms. Beth Bardwell
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Dear Ms. Bardwell:

This responds to your September 12, 2003 letter to me regarding questions you and the World Wildlife Fund have on the Reformulation of River Management Alternatives for the Rio Grande Canalization Project report, dated August 2003. We shared your letter with Parsons, which, by the way, was very glad to receive your substantive comments; and as a result, they were able to strengthen the environmental document we hope to release soon. As you stated in your letter, you anticipated a substantial dedication of time and effort in preparing answers to your questions. It has taken a long time to respond due, not only to the detail of your questions, but also due to project scheduling that included completing and distributing a preliminary draft environmental impact statement for USIBWC staff and cooperating agency review which is still underway.

Attached, please find the responses largely provided by Parsons. Each question is restated, followed by the appropriate response. I hope this adequately responds to your questions, and you and your organization receive an enhanced understanding of the proposed actions and analysis in the upcoming document. We look forward to your comments on the draft environmental impact statement when it is released for public review in the near future. I appreciate your patience in receiving this reply.

Sincerely,

Sylvia A. Waggoner

Sylvia A. Waggoner
Acting Principal Engineer
Engineering Department

Attachment:
Responses to WWF September 2003 Comments

cc w/Attachment:

Dr. R.C. Wooten
Vice President
Principal
Parsons Engineering Science, Inc.
8000 Centre Park Drive, Suite 200
Austin, Texas 78754

Response to WWF September 2003 Comments

Question 1. What is the correct number of acreage for planting sites within the ROW for Integrated Land Management Alternative? Table 2-4 indicates 149 acres under Integrated Land Management, 141 acres under Targeted River Restoration, Table 4-9 indicates 217 under Integrated Land Management Alternative but 189 under the Targeted River Restoration and the text indicates 223 acres (2-8).

Planting site estimates were based on individual point projects listed in the reformulated alternative descriptions (Tables 3-6 and 3-8). The before-after reformulation comparison presented in Table 2-4 was not updated to reflect an increase in planting area estimates.

For the Targeted River Restoration Alternative, 189 acres is the correct updated value as listed for 10 projects in Table 3-8. This value is correctly quoted in Table 4-9, but a lower estimate of 141 acres is presented in Table 2-4.

For the Integrated USIBWC Land Management Alternative, 223 acres is the updated value as listed for 14 projects in Table 3-6. This value is correctly quoted in page 2-8 of the text, but a lower estimate of 149 acres is presented in Table 2-4 (in Table 4-9, 217 acres instead of 223 acres is an entry error).

Question 2. What was the basis for reducing the acreage for expanded remnant bosque/riparian veg from 249 to 3 acres in the Integrated Land Management Alternative? (See Table 2-4) Were they outside the limits of the hydrologic flood plain, outside the ROW or did they result in "relatively" high water consumption?

"Expand remnant bosques/riparian vegetation" as a single measure in the AFR listed for comparison in Table 2-4, refers to two types of measures in the reformulation: expansion of riparian vegetation and enhancement of bosques. High water consumption was not a consideration in acreage changes.

All riparian vegetation acreage within the hydrologic flood plain in the AFR was retained or expanded as part of planting areas (up to 223 acres), shavedowns (127 acres), or induced overbank flows (516 acres).

Enhancement of existing bosques by selective salt cedar removal, was limited in the reformulation to 3 acres located within the flood plain. Intervention was no longer proposed in the reformulation for other remnant bosques located in uplands (either within or outside the ROW) that are largely dominated by salt cedar. Extensive salt cedar removal in the floodway, however, would be conducted as an implementation action for other measures. Attachment A identifies site-by-site changes to remnant bosque areas as well as other measures.

Question 3. Did Parsons prepare tables in the Reformulation report that breaks down environmental enhancement sites into acreage distribution by physiognomic class and

geographic distribution by management unit (see for comparison Table 2.8 in AFR)? The reason I ask is while Parsons claims to have retained the majority of the 48 locations it is difficult to compare where they have been modified and in what respect given the information provided in the Reformulation report.

Detailed tabulated data by physiognomic class, not presented in the Reformulation Report, will be included in the DEIS as the basis for comparison between baseline conditions and those anticipated for each alternative. [Note: no Table 2.8 was presented in the AFR; tables in the DEIS are structured as those presented by in Section 7 of the AFR (7.2 through 7.6)]

Most sites were retained in the reformulation as point projects or were incorporated into more extensive linear projects, typically native grassland management or bank overflows by seasonal peak flows, that extend beyond the original site boundaries. Sites eliminated from consideration, also identified in the table, are located in the southern section of the RGCP where potential levee deficiencies were identified, or in uplands where intervention of remnant bosques is no longer proposed (as discussed in the previous response). The rationale for changes was described in Section 2.3 of the Reformulation Report, and summarized in Tables 2-6 and 2-7.

Attachment A was prepared to illustrate the point that most acreage for environmental measures was retained as point projects, and often expanded as part of a linear project. Attachment A presents a list of the 48 environmental enhancement sites initially identified in the AFR and their modification in the reformulation.

Question 4. In Integrated Land Management Alternative, what model was used to predict how much acreage would be inundated under reference flows, see discussion 2-7 to 2-8? Which reference flow was the basis for predicting the limits of the hydrologic flood plain? Where in the report can I find the data/evaluation that supports the estimate? Is it also in the handout in the October 22, 2001 presentation (Appendix D)?

A HEC-RAS simulation was performed using as steady-state input flows listed by RMU in Table 2-5 of the Reformulation Report (page 2-7). Those flows were derived from long-term flow data from gages in the RGCP. Data for the October 22, 2001 presentation were used in the simulation of water releases from Caballo Dam, but were not used in the hydrologic flood plain estimates.

As indicated in Table 2-5, flows ranging from 2,586 cfs to 3,561 cfs were used to delineate a likely active hydrological flood plain based on average monthly data, and were obtained from the USACE 1996 report (Tables 2-2, 2-4 and 2-6 of Vol. 4 of USACE 1996 report, copies of which are attached to this letter). Resulting water elevation data by cross section were then incorporated into the GIS topographic map to produce the graphical representation by site presented in Figures 2-4 through 2-22. In the DEIS, use of the HEC-RAS model will be specifically indicated, and an appendix will be

included presenting copies of USACE 1996 tabulated flow data used as input in the simulation (see Attachment B).

Question 5. I wanted to verify whether the additional recreational acres within ROW identified as an environmental enhancement under Integrated land management was limited to 14 acres or 14 sites of unknown acreage? If 14 sites, where are those sites located, what type of recreational use is proposed and how much acreage would be included in each site?

The value refers to acres as listed in Table 2-4 of the Reformulation Report, and originally identified in the AFR (Table 7.1). It applies to two sites, one at river mile 62 near Leasburg Dam (4 acres) and the other at mile 5 in Sunland Park (10 acres on west bank). Site description and proposed uses were identified in the AFR for each location (pages 6-27 and 6-36, respectively).

Question 6. What percentage of IBWC lands is currently under lease as recreational areas and can you provide me the name of leaseholders and locations by River Unit?

The Rio Grande Corridor Project by the City of Las Cruces encompass a distance of 11 linear miles, from the Shalem Colony Bridge to the Mesilla Dam, and is envisioned for both the western and eastern banks of the southern Rio Grande. The projects would involve cooperative agreements from the USIBWC, as well as a number of other agencies. The total RGCP lands leased is about 23,200 acres; Rio Grande Corridor Project is about 475 acres or 2 percent of leased RGCP land.

The Rio Grande River Park is an ongoing project as part of redevelopment of downtown El Paso that would include an approximately 80-acre linear park and a trail along the Rio Grande. The USIBWC provides access to a portion of the trail corridor. The extent of RGCP lands leased for Rio Grande River Park is about 101 acres or 0.44 percent.

The USIBWC has an existing lease with the County of El Paso for the El Paso County River Park and trail extending from Country Club Bridge to Vinton Bridge on the west floodway. The county is currently developing the approximately 150-acre area. The county plans a 75-acre extension on the east floodway from Vinton Bridge to the Texas / New Mexico state line. All acreage is planned within the RGCP or about 0.97 percent of leased lands.

The cities of El Paso and Sunland Park, New Mexico operate a 57-acre river park located within the flood plain on the east side of the river, upstream from Anapra Bridge. The cities are proposing to eventually connect their respective river parks to the existing El Paso County river park. Master plans indicate connecting all existing and proposed city parks adjacent to the Rio Grande along the Canalization and Rectification projects.

At Anthony, New Mexico a 62-acre golf course is operated and maintained by the Anthony Country Club. Part of the course (eight tees and greens, about 33 acres or about 0.14 percent of leased RGCP lands) utilizes the flood plain on the right bank of the river.

Question 7. In Integrated Land Management Alternative, what activities are included in the "emphasis on water conservation" (2-8)?

Salt cedar control remains the key action for water conservation. In addition, sponsoring on-farm water conservation programs (instead of direct water rights acquisition previously emphasized in the AFR) was adopted as the primary water acquisition strategy proposed for both the Integrated USIBWC Land Management and Targeted River Restoration alternatives (Section 3.8.2).

Question 8. Under enhancements by seasonal peak flow, the report states that the "discharge would be a combination of coordinated irrigation deliveries and additional releases from purchase of water rights" (2-8). What is the amount of discharge? What percentage of that would have to come from purchase of water rights?

Typical releases from Caballo Dam during the March-October irrigation period have an average of 1,300 cfs as indicated in Figure 4-4, with daily releases changing from week to week for any given year to meet irrigation needs, based on water availability. Water releases above irrigation values at any given time (assuming this action receives authorization by the USBR Rio Grande Project) require water acquisition. For a theoretical maximum discharge of 5,000 cfs from Caballo Dam, up to 3,700 cfs acquisition would be required over the selected discharge period (in this case up to 74% of the total). A 3,700 cfs release sustained over a 1-day period represents an approximate 7,400 ac-ft discharge that needs to be multiplied by the number of days (or fraction of a day).

Question 9. On what basis were "artificial wetlands" deemed unsustainable in this semi-arid region given several managed wetland areas in Socorro (Bosque del Apache NWR), Las Cruces (Picacho Wetland), and El Paso (Rio Bosque and Feather Lake) and their relatively high habitat value? (2-11)

Construction of artificial wetlands were not considered a priority measure to be included in the river management alternatives for two reasons:

- First, artificial wetlands have a high water consumption (greater evapotranspiration than open water) whose construction would come at the expense of other measures proposed for riparian corridor development (riparian bosque and native grasslands). This was a key consideration since no water rights are currently available for any

environmental measure. Managed areas listed in the question are not necessarily applicable to large scaled restoration of the RGCP. For example, the Rio Bosque Wetland Refuge, was constructed by the USIBWC as a USFWS required mitigation measure, and placed downstream from a steady, controlled water source, a wastewater treatment plant.

- Second, the long-term success of artificial wetlands has often been questioned. We agreed on this point with the SWEC opinion replied to in a June 13, 2001 correspondence to the USIBWC (page 3 of Interim Report) that stated "Proposed artificially constructed wetlands have questionable merit in terms of long-term success (See Malakoff, D. 1998. 'Restored Wetlands Flunk the Real World Test')... Better the USIBWC cooperate with the NRCS apply its resources to establishing continuous *strands* or buffer *strip* vegetation along a restored channel capable of conveying hydrologic pulses." Riparian corridor development is a core action adopted for the Targeted River Restoration alternative.

Question 10. What exact measures are being proposed under Land Management restoration measure of modified grassland management? Specifically,

a. what modifications would occur to the mowing regime,

b. what types of native grasses are being considered, what percentage of ROW would be planted with native grasses and how would the native grasses be planted and established?

c. What type(s) of salt cedar control would be used?

Question 10.a Currently both floodways and levee slopes in the RGCP are mowed at least once a year prior to July 15. The purpose of mowing is to control growth of shrubs and trees, primarily salt cedar. Salt cedar can reach up to 9 feet in height in a single growing season, as such must, it be controlled annually. The modified grassland management would replace current mowing regime in selected areas to improve wildlife habitat by 1) increasing vegetation diversity, 2) develop native herbaceous vegetation, and 3) improve the riparian corridor and upland/riparian interface. In order to continue to provide salt cedar control, control methods such as herbicide, mechanical (mowing), manual and/or burning would be instituted. Site-specific condition would dictate method or combination of methods used. Measure implementation would include:

- Site preparation, salt cedar treatments (e.g. mowing followed by herbicide) and shallow disking to prepare soil and chemical treatments (salinity management),
- Seeding of native vegetation, and
- Maintenance and monitoring. Maintenance would include continued salt cedar control using treatments specific to site conditions and vegetation treatments that would promote the establishment and sustainability of native

species. Monitoring would be in place to assess treatment results and modify methods as appropriate.

The modified grassland management areas are outside the hydrologic flood plain and would be dominated by intermediate and xeric native species. Depressions and shallow groundwater interspersed within these areas would support mesic and hydric vegetation, potentially creating additional diversity and improved wildlife habitat.

Question 10.b Grasses have the greatest potential for holding soils, thus decreasing erosion. They also can create open areas, which coupled with densely wooded patches create an edge habitat that is ideally suited for a number of small mammal and bird species (USACE 2003). Native grasslands would be developed to improve habitat corridors between patches of bosque, provide increased protection of riparian wetlands, and enhance wildlife habitat. However, this reference community would continue to be disconnected from the river, and would be composed primarily of intermediate and xeric native grasses and other herbaceous vegetation. Within isolated mesic and hydric areas, species would include salt grass, cattail, sedges, and rushes.

Grasslands would be established by plantings and maintained through woody vegetation control. A woody component would likely be present, but typically less then a 20 percent aerial coverage. Where appropriate, woody vegetation would be retained for structural diversity and would include native woody vegetation such as screw bean mesquite. More xeric species would become established on higher sites. Salt cedar would be controlled. Vegetation along the river and in wetlands locations would not be maintained, with the exception of salt cedar removal to improve bank stability and decrease potential erosion and sedimentation.

Question 10.c Prescribed burning of grassland may be warranted to improve grass production. Most grasses are relatively tolerant of fire, and the subsequent nutrient pulse will allow grasses to rapidly recover after a fire. If native grasses are well established, burning will control most woody plants (if they are small) and will promote growth of most herbaceous plants. In addition, if native plants are well established, particularly in the rooting zone, burning will not harm the roots and the soil will remain stabilized. However, burning would need to occur when woody plants such as salt cedar are not actively seeding, as burning will create open spaces for seedling establishment of salt cedar. If there are woody plants present on the areas considered for burning, these species would have to be assessed for fire-tolerance. Salt cedar tends to be more tolerant of fire than some native riparian species (Scurlock 1998; Crawford *et al.*, 1996).

Question 11. Did Parsons do a WHAP (Wildlife Habitat Appraisal Procedure) analysis to determine the comparative habitat value from two revised measures in the Reformulation report: (1) discontinuation of mowing on 488 acres to managed grasslands on 1641 acres; and (2) cessation of grazing leases on 881 acres to modified grazing leases on 3552 acres?

Potential WHAP scores reflect the contribution of native plant communities to wildlife habitat quality. WHAP data are used as a basis for evaluation of impacts and, as such,

are included in the DEIS evaluation, not the Reformulation Report. The table below illustrates criteria used for WHAP in the DEIS. The table presents predicted WHAP values due to implementing environmental measures. The "maximum range" possible column represents the highest hypothetical value for a reference community using the WHAP score sheet. The potential HQ value represents an estimated score for a reference community after 20-year implementation. The potential score is 80 percent of the maximum score. WHAP scoring criteria such as temporal development and uniqueness and relative abundance limit a reference communities' potential HQ value to scores below the maximum score.

Reference Community	Potential HQ Value	Maximum Score Range
Improved uplands	0.50	0.63 – 0.88
Improved floodway	0.60	0.75 – 1.0
Native grasslands	0.65	0.80
Native bosque	0.80	1.0

Question 12. Table 2-7 indicates that "no environmental measures were proposed for sites within urbanized reaches where flood control concerns were potentially significant." Please specify in what river mile are these "urban reaches" located? On what basis/analyses was a decision made that flood control concerns were potentially significant in these urban reaches? How many sites were excluded on this basis and what were the specific locations of the environmental measures in river miles?

Residential areas (low, medium and high intensity) are defined in the Doña Ana County digital land use map. Copies of the land use maps are included as the baseline to evaluate potential impacts in the Preliminary DEIS currently under evaluation by the USIBWC. A summary of this land use was provided in the Reformulation Report as the simplified diagram shown in Figure 4-9. This figure identifies predominant agricultural vs. residential/urban areas in ½ mile intervals along with potential levee deficiencies.

Potential levee deficiencies in hydraulic simulations are defined by freeboard availability relative to the simulated peak water elevation. Since the design criterion is a 3 feet freeboard, potential levee deficiencies were qualified as significant when estimated water elevations resulting in levees without freeboard or a freeboard less than 1 foot, and moderate for levee sections with freeboards from 1 foot to 2 feet. Freeboards in the 2 to 3 feet range were considered a low deficiency potential considering the conservative nature of the HEC-RAS flood simulations. Figure 4-9 shows that most significant or moderate deficiencies (less than 2 ft freeboard) are located in reaches adjacent to urban areas in Las Cruces and El Paso. Attachment A indicates changes from the AFR to the reformulated alternatives on a site-by-site basis.

Question 13. Why was the amount of land easements/land acquisition reduced from 1183 acres to 999 acres (Table 2-4)?

Conservation easements were actually increased to 1,618 acres in the reformulation as listed by RMU in the description of the reformulated Targeted River Restoration alternative (Section 3.4.5 and Table 3-7). However, as indicated in question No. 1, the reformulated alternatives before-after comparison presented in Table 2-4 was not updated to reflect the 1,618 acres indicated in Section 3. The distribution of conservation easement estimates to be used in DEIS is as follows:

Conservation Easement Location	Acreage	Restoration
Cropped CE	288	Native grasslands management
Hydrologic Floodplain	771	Native bosque enhancement/planting. The majority of CE within or adjacent to Seldon Canyon and nearby Picacho wetlands pilot project.
Other	559	Preservation of corridor width. Includes remnant bosques outside the hydrologic floodplain.
Total	1,618	

Question 14. Under the original Formulation report, 1062 acres w/in the ROW and 914 acres outside of ROW were identified for salt cedar control (See AFR Table 2-12). This action was identified as an "implementation action" in the Reformulation report. Are these acreage now included in the acreage count under some other restoration measure such as modified grazing lease, managed grasslands or easements? What does it mean to be called an implementation action as opposed to a "measure"?

Salt cedar control is required for implementation of various measures (bosque enhancement, cottonwood establishment sites, management of grazed areas and native grasslands) but is no longer considered a river management objective (as it was in the AFR). For this reason all salt cedar removal acreage is included as part of other measures.

Environmental measures are composed of various activities. For instance the environmental measure "opening former meanders" would include activities such as 1) site survey and design, 2) vegetation clearing and disposal, 3) excavation and sediment disposal, 4) planting and site preparation, 5) monitoring and maintenance, among others. Salt cedar control activities would be captured in task 2 and 5, and assessed as an effect/result of implementing the environmental measure. In our opinion, it is best to assess salt cedar control as an "effect" rather then an environmental measure.

That said, salt cedar control is a fundamental aspect of a broader RGCP vegetation management program. Vegetation management is conducted to reduce the amount of vegetation (primarily salt cedar) and potential obstructions within the ROW. The

USIBWC manages salt cedar through mowing by USIBWC staff or as part of lease agreements in which lessees agree to mow/control salt cedar on leased property. Implementation of environmental measures results in a change of vegetation management practices. This change in vegetation management was one the indicators used in the DEIS analyses.

The following tables, included in the DEIS, list salt cedar control methods for riparian areas (upland areas represent an additional 1,805 ac not shown in table) within and outside (conservation easements) the ROW by alternative.

Flood Control Improvement Alternative

Environmental Measure	Acreage	Initial Site Preparation Activities	Long-Term Maintenance
Floodway Grazing Management	1,747	Stocking rate evaluation and potential adjustment on a lease by lease basis	Modified - Salt cedar control by chemical or mechanical means (mowing).
Mowing by USIBWC	4,657	No change from current practices	No Change from current practices.

Integrated USIBWC Land Management Alternative

Measure	Acreage	Initial Site Preparation Activities	Long-term Maintenance
Floodway Grazing Management	1,747	Stocking rate evaluation and potential adjustments on a lease by lease basis.	Salt cedar control by chemical (spot) or mechanical means. Mechanical removal would be avoided along river edge and wetlands areas.
Native vegetation planting	223	Selective removal and clearing through mechanical means. Mechanical means could be required in dense-monotypic stands.	Salt cedar control by spot application of herbicide or cut-stump methods. Mechanical removal would be avoided along river edge and wetlands areas.
Stream bank reconfiguration Existing bosque enhancement	127	Complete removal of vegetation through mechanical means and excavation to within 1 foot of mean irrigation flow.	Salt cedar control by spot application of herbicide or cut-stump methods. Mechanical removal would be avoided along river edge and wetlands areas.
Native Grasslands	1,641	Removal of vegetation by herbicide (aerial or spot), shallow disking.	Salt cedar control by chemical (spot). Periodic mowing could be used in some areas. Mechanical removal would be avoided along river edge and wetlands areas.
Mowing by USIBWC	2,674	No Change from current practices	No Change from current practices.

Targeted River Restoration Alternative

Measure	Acreage	Initial Site Preparation Activities	Long-term Maintenance Activities
Floodway Grazing Management	1,688	Stocking rate evaluation and potential adjustment on a lease by lease basis.	Salt cedar control by chemical or mechanical means.
Native vegetation planting/enhancement	960	Selective removal and clearing. Mechanical means could be required in dense-monotypic stands such as in sites within Seldon Canyon which would require extensive removal of mature salt	Salt cedar control by spot application of herbicide or cut-stump methods. Mechanical removal would be avoided along river edge and wetlands areas.

Measure	Acreage	Initial Site Preparation Activities	Long-term Maintenance Activities
		cedar.	
Seasonal peak flows /bank preparation Existing bosque enhancement	516	Complete removal of vegetation through mechanical means/ bank preparation	Salt cedar control by herbicide or cut-stump methods. Mechanical removal would be avoided along river edge and wetlands areas.
Native grasslands	1,929	Removal of vegetation by herbicide, shallow disking. Mature woodlands not treated in order to provide structural diversity in floodway.	Salt cedar control by chemical or mechanical means. Periodic mowing could be used in some areas.
Reopening of meanders	142	Complete removal of vegetation through mechanical means/ bank preparation and excavation	Salt cedar control by spot application of herbicide control or cut-stump methods. Mechanical removal would be avoided along river edge and wetlands areas.
Mowing by USIBWC	2,223	None	Continued annual mowing

Question 15. What was the basis for excluding 47 acres of new meanders outside of the ROW from consideration as a restoration measure under the Targeted River Restoration?

With the exception of meander 41.5 NMFG, levees did not exhibit potential overtopping during a 100-year flood event as calculated using HEC-RAS. Removal of levees for the sole purpose of environmental enhancement was eliminated during reformulation. In the case of a 20-acre meander at 41.5 NMFG, the opening of this meander was eliminated because of the potential loss of wetland/wet meadow habitat from meander excavation. Meander 41.5 NMFG is identified within a larger conservation easement.

Question 16. What was the basis for excluding minimum in-stream flows from consideration in Targeted River Restoration alternative?

Minimum in-stream flow is not a consideration for the RGCP as the opposite condition, high stream flows during the 8-month irrigation season (that includes critical fish reproduction periods), is the key concern identified. Elevated flows associated with water delivery create a high water velocity habitat with areas of slow-moving waters more suitable for fish reproduction. Minimum in-stream flows, unlike the case of the Middle Rio Grande, have not been documented by any technical study as a priority issue for the RGCP.

Question 17. Under "Maintenance of Levee System", p.3-1, the report states that the slopes are mowed to prevent growth of bush and trees that could obstruct flows or cause root damage to structure itself." On what basis/analyses was the conclusion drawn that growth of bush and trees could obstruct flows or cause root damage to the structure itself?

Both flow obstruction by vegetation (in the sense of increased roughness coefficients) and soil levees weakening by tree roots (particularly of existing 60-year old soil structures) are basic design concepts. USACE levee design guidelines limit vegetation on a levee embankment to sod-forming grasses of 2 to 12 in. in height to provide for structural integrity, inspectability, and unhindered flood-fight access to levees (USACE Design and Construction of Levees, Engineer Manual 1100-2-1913). Obstructions in the channel usually refer to unstable or fallen trees, and it's a judgment call by the USIBWC Project Manager.

Question 18. Under "Mowing of Floodway", p.3-2, the report states "floodway areas outside the main channel are maintained to remove obstructions." What is the justification for removing "obstructions" and on what basis/analyses was the conclusion drawn that vegetation in the floodway could "obstruct" flows?

As indicated for question 17, increase in floodway vegetation results in increased roughness coefficients, again a basic design concept, and the reason –along with salt cedar control— that annual mowing is conducted. Typical roughness coefficients increase (and thus potential flow obstruction) ranges from 0.03 for short grass (Manning's "n"), to 0.10 for medium to dense brush, and up to 0.15 for dense willows (values from Table 2.1 of HEC-RAS River Analysis System, Version 2.2, September 1998).

The relevant question is to which extent that increase is significant in terms of flood control protection relative to current conditions. This is a critical issue that is evaluated in the DEIS, as many stakeholders have expressed their opposition to expansion of floodway vegetation due to the possibility of reducing flood control potential within the levee system.

Question 19. Under the Modified O&M and Flood Control alternative, the report states that modeling and absence of information on structural integrity were insufficient to accurately predict how much levee height increase and building of additional levees will be necessary, but estimates were included anyway as a "work assumption" (3-5). Can you explain to me what IBWC means by "work assumption?" I am having a difficult time understanding the justification for including it and then failing to complete the necessary analyses to objectively evaluate this alternative, or, alternatively, why the alternative was included at all or especially in light of the language in Section 4.3.4, "Reevaluation of flood control strategies is an ongoing task conducted by the USIBWC as part of its mission, and whose scope is beyond the evaluation of river management alternatives for the RGCP."

The question indicates that clarification is needed in two areas, why is flood control evaluated as part of the EIS and why include this action as an alternative.

<u>Extent of the Flood Control Evaluation in the EIS</u>

A detailed evaluation of flood control system improvements was completed in 1996 by the USACE. The study encompassed detailed hydrology and hydraulic evaluations, sedimentation analysis from the Rio Grande tributary basins, and a scour and deposition analysis along the RGCP. Findings of this extensive study are not being reevaluated as part of the EIS, as estimates of levee freeboard and sediment transport are already available and supported by appropriate technical evaluations. Thus the statement *"Reevaluation of flood control strategies is an ongoing task conducted by the USIBWC as part of its mission, and whose scope is beyond the evaluation of river management alternatives for the RGCP."*

USIBWC is currently gathering additional data for flood control system improvements in an area not covered by the 1996 study, structural condition of the levees. Results of the structural analysis could indicate a need to replace limited sections of the levee system, but it will not modify current levee freeboard estimates or findings of the sediment transport analyses.

The specific issue under evaluation in the EIS is that of potential effects of environmental measures on the flood control system given findings of the 1996 RGCP improvement study. To that effect, the same analytical tool used in the 1996 study was used to assess potential changes in flood control if environmental measures were incorporated as part of revised river management alternatives within a 20-year horizon.

Inclusion of the Flood Control Improvement Alternative

The USIBWC will implement a number of recommendations from the USACE 1996 improvement study for the RGCP and ongoing levee system structural evaluation according to priorities that are determined for each fiscal year budget.

Since it is possible for Congress to provide separate funding (and in different years) for measures associated with a modified river management strategy from those of a flood control improvement program, individual evaluation of potential effects of this program in the EIS is in USIBWC (and the taxpayers) benefit. Separate evaluation of the flood control improvement program effects is also useful in the EIS because it is clear that effects of environmental measures need to be assessed within the framework of a future levee rehabilitation program likely be implemented within the same 20-year horizon. This analysis is particularly needed to assess effects from construction activities associated with potentially extensive levee rehabilitation activities on resources such as air quality, land use, soils, socioeconomics, noise and transportation.

Since targets for flood control improvement and timing of implementation are not presently fully defined, a conservative approach was adopted in the EIS for evaluation of potential effects. The approach was to assume (thus "a work assumption for the EIS") that all potential freeboard increases identified by the 1996 hydraulic modeling simulation will be eventually addressed by in-place rehabilitation. This simply implies that construction for levee system improvement could be extensive (a conservative assumption for effects evaluation), and implemented concurrently with environmental measures.

Question 20. The report states (4-20) that two reaches successfully met the criteria for levee relocation. Is "levee relocation" a restoration measure incorporated in any alternative? I do not see these measures included in any of the figures detailing point projects, Figure 2-4 through 2-22 or included in Table 2-4 as a measure under the Targeted River Restoration. If levee relocation was not included in any alternative, why not, considering at least two reaches met the criteria established by Parsons?

Page 4-20 of the Reformulation Report indicates that at those two locations (representing less than 5% of the levee system) an analysis of levee relocation would be warranted as part of a revised flood control strategy. The rephrasing "the two reaches met the criteria for levee relocation" is incorrect as in-place rehabilitation is the preferred course of action to preserve the federal investment in the levee system. Current technical data indicates that, excluding a limited reach in Canutillo, there is not a need or advantage in reconstructing or relocating any sections of the levee system. This conclusion could be modified in the future if flood easement use and/or levee relocation prove advantageous for those two levee sections based on a cost-benefit and risk analysis, or identification of structural deficiencies.

Question 21. The criteria for levee relocation state that "levee deficiencies adjacent to urbanized areas must be addressed by levee rehabilitation at their current location (structural measures)." How was "urbanized areas" defined? Did Parsons look at adjacent land use to the "deficient" levee in "urbanized areas? What was the justification/basis for the assumption that "levee deficiencies adjacent to urbanized areas must be addressed by levee rehabilitation at their current location (structural measures)?"

For definition of urbanized areas, see response to Question 12. Flood control strategy is discussed at length in Section 4.3 of the Reformulation report (Flood Control Evaluation) that presents a comparison of potential levee deficiencies and adjacent land use. The detailed land use analysis used in preparation of Figure 4-9 is included in the DEIS as baseline conditions of potential effects evaluation for that resource area, as previously indicated in the response to Question 12.

USIBWC flood control strategy relies on the use of existing levees along urban areas, largely in Las Cruces and El Paso. To modify that strategy a valid rationale must be provided a) to justify relocation of existing levees (6 to 10 feet tall) that can be rehabilitated in place by an average 2 feet height increase, and b) to incorporate into the RGCP floodway urban areas that the levee system are intended to protect. No such justification exists as the need for levee reconstruction has not been identified (see response to Question 19).

Question 22. Are the 127 acres of bank shave-downs included in the estimate of 516 acres of floodway inundated with seasonal peak flows or are they in addition to the 516 acres under the Targeted River Restoration alternative?

Yes, shavedown areas under the Integrated Land Management Alternative would be inundated by peak flows and part of the 516 acres listed for the Targeted River Restoration Alternative. Under the latter alternative, lowering of the stream bank to induce overbank flows (shavedowns) would not be required.

Question 23. All 127 acres of the bank shavedown restoration measures occurs in the upper and lower Rincon Valley. Table 3-4 indicates recurrence of peak daily flows during the months of March and April over the past 63 years below Caballo Dam at station 08-3625.00. On what basis was the conclusion made that peak daily flows below Caballo Dam occurred with the same frequency at river miles 104, 103, 102,101,98,94,92,83,76? In other words, was the necessary modeling completed to estimate the presence/absence of attenuation of these flows in the reach between station 08-3625.00 and the above river miles? If so, what model was used and how much attenuation was estimated?

Table 3-4 was included to illustrate that daily peak releases from Caballo Dam can be reasonably expected to exceed the channel design value of 2,300 cfs at least one day every other year. That information is not used for estimates of shavedown areas as random occurrences of a daily peak flow are not likely to develop or support a riparian corridor. A different approach to facilitate understanding of the concept is tabulated data showing average monthly flows (based on monitoring data) that are exceeded with a 10 percent frequency for a given month and RGCP reach. The table below illustrates the fact that flows above channel design values can be expected (as a monthly average) with some relative frequency. Average monthly flows selected as a guideline for riparian vegetation development are also listed as a reference.

	Estimated 10 Percent Exceedance Flow (cfs)*					
Month	Percha Dam to Seldon Canyon	Seldon Canyon to Leasburg Dam	Leasburg Dam to Las Cruces (I-10)	Las Cruces to Mesilla Dam	Mesilla Dam to Anthony, NM	Anthony, NM to American Dam
October	884	921	696	703	397	503
November	46	83	92	100	104	148
December	37	66	67	74	77	101
January	90	51	53	59	63	79
February	636	693	610	598	382	411
March	1,946	1,910	1,458	1,469	742	1,046
April	1,497	1,524	1,175	1,202	624	912
May	1,970	2,011	1,537	1,551	815	1,154
June	2,732	2,884	2,496	2,540	1644	2,113
July	**2,308**	**2,377**	**1,827**	**1,845**	**1068**	**1,499**
August	1,736	1,821	1,360	1,387	728	1,114

September	1,507	1,612	1,243	1,264	626	904
Reference flows** a. Channel design value	2,350	2,350	1,900	1,900	1,600	1,600
b. Riparian vegetation development	**3,561**	**3,470**	**3,035**	**3,270**	**2,545**	**2,586**

* 10 percent exceedance indicates an average monthly value that is exceeded with a 10 percent probability based on historical gage data. For example, 10 percent of monthly flows estimated for the Percha Dam-Seldon Canyon reach exceeded 884 cfs, and 90 percent were below that number (Data from El Paso-Las Cruces Regional Sustainable Water Project, Water Resources Technical Report (2000, Appendix C)

** Channel design values and flows to estimate extent of riparian vegetation development were ontained from USACE (1996).

Quantification of a 127 acres target for shavedowns was based on an empirical reference flows for riparian habitat development along the RGCP. These flows are listed in Table 2-5 and discussed in the rationale for Integrated Land Management Alternative reformulation in Section 2.2.2. As previously indicated in the response to Question 4, the reference flow is based on a sustained flow obtained from monthly historical flow data summarized by USACE (1996) and presented in Attachment B. Monthly data represent the 10-year high flow period on record for various reaches of the RGCP. HEC-RAS modeling was used to simulate water elevation for each reach from the flow input data.

Question 24. What are the estimates of increase in consumptive water use for each of the restoration measures below? (On page 4-4, the report sets out two estimates but it is unclear to me which of the restoration measures below are "riparian vegetation development" and which are "planting sites.") On what basis/justification were these estimates drawn from? Further, there appear to be no estimates for salvage or depletions from seasonal flows, open water areas in reopened meanders or modified dredging at arroyos. Is it estimated that there will be no change in water use from these measures? How much water is estimated to be lost from evapotranspiration from the existing vegetation in the floodway under current management? It is critical to know this figure as the language on 4-4, specifies the estimates in water consumption are an "increase" over existing use and not "actual" water consumption estimates.

a. *223 acres of native vegetation planting*
b. *127 acres of bank shavedowns*
c. *516 acres of inundated floodway*
d. *141 acres of reopened meanders (25% open water and 75% native cottonwoods),*
e. *modified dredging at 12 arroyos*

Water use is an effect for any given measures and, as such, it is evaluated in the DEIS not in the Reformulation Report. Values listed in page 4-4 were obtained from the 2001 AFR that included a water use analysis and support documentation (Section 9, Table 9.5). The

following support tables have been included in the Preliminary DEIS currently under evaluation by the USIBWC:

Water Consumption Estimates for Rio Grande Basin Vegetation

Type of Coverage	Annual Water Consumption* (ac-ft/ac)	Start date	Term Date	Evapotrans-piration (inches)	Annual Forecast (inches)
Pasture grass	4.01	Mar 15	Oct 20	41.3	48
Miscellaneous grass	4.63	Apr 05	Oct 20	47.7	56
Cottonwood	3.48	Apr 05	Nov 21	30.4	42
Salt cedar	4.96	Apr 05	Nov 21	49.5	59
Riparian wood / shrub	5.35	Apr 05	Nov 21	46.7	64
Open water	8.48	Jan 01	Dec 31	73.3	102
Marsh	8.85	Jan 01	Dec 31	76.5	106

* Annual forecast expressed in feet. Data for 2001 from USBR Rio Grande Basin AWARDS System and ET Toolbox Project (www.usbr.gov/pmts/rivers/awards/Nm/riogrande.html)

Assumptions for Water Consumption Estimates

Type of Measure	Assumptions
Levee rehabilitation	No effect on surface water consumption.
Modify grazing practices	No net change for uplands. In the floodway, managed grasslands replace grazed areas (4.63 – 4.01 = 0.62 ft/yr increase).
Modified grassland management in floodway	Managed grasslands replace currently mowed areas (4.63 – 4.01 = 0.62 ft/yr increase).
Plant woody native vegetation	Tree planting areas replace both currently mowed areas (5.35 - 4.01 = 1.34 ft/yr increase), and salt cedar areas (4.96 – 3.48 = 1.48 ft/yr reduction)
Enhance existing bosques	No water consumption increase as existing bosques are maintained.
Bank shavedowns	Bosques replace both currently mowed areas (5.35 - 4.01 = 1.34 ft/yr increase), and salt cedar areas (4.96 – 3.48 = 1.48 ft/yr reduction)
Open former meanders	Open water replaces both currently mowed areas (8.48 – 4.01 = 4.47 ft/yr increase) and salt cedar bosque (8.48 – 4.96 = 3.52 ft/yr increase).
Modify dredging at arroyos	No net increase in water surface area exposed to evaporation.
Controlled peak flows	As a conservative scenario, consumption of entire volume of water released assuming no downstream utilization for agricultural irrigation.
Conservation easements	No increase in current water consumption for remnant bosques (no intervention), enhanced bosques (selective salt cedar removal), or agricultural lands (managed grasslands replace cropped areas).

[Note: this and subsequent questions, listed in the letter as 23 through 35, were renumbered to follow previous numbering of the questions].

Question 25. [listed as 23] The Reformulation report states that implementation of native vegetation establishment and localized changes in channel geometry are likely to require significant water acquisition (3-11). How much water does Parson's estimate

these measures will consume? On what basis were these estimates computed/prepared?

The basis for water use was presented in the previous response. Water consumption estimates are presented in the Preliminary DEIS currently under evaluation by the USIBWC and are presented in the following two tables.

Water Consumption Estimates for the Integrated USIBWC Land Management Alternative

Type of Measure	Area (acres)	Unit Rate (ac-ft/yr)	Water Consumption at Full Implementation (ac-ft/yr)	Use Relative to 645,000 ac-ft/yr of Diverted Water*
Modified grazing leases				
Uplands (50.8%)	1,805	0.00	0.0	0.00%
Floodway (49.2%)	1,747	0.62	1,083	0.17%
Native grasslands	1641	0.62	1,017	0.16%
Tree planting areas				
Currently mowed areas	146.0	1.34	196	0.03%
Salt cedar areas	77.0	-1.48	-114.0	-0.02%
Stream bank shavedowns				
Currently mowed areas	74.0	1.34	99	0.02%
Salt cedar areas	53.0	-1.48	-78.4	-0.01%
		Total Estimate	**2,203**	**0.34%**

* An average diversion of 645,000 ac-ft/yr was based on a combined average of 890 cfs along the RGCP (181 cfs at Leasburg Dam, 312 cfs at Mesilla Dam, and 397 cfs at American Dam; data from Figure 3-3).

Water Consumption Estimates for the Targeted River Restoration Alternative

Type of Measure	Area (acres)	Unit Rate (ac-ft/yr)	Water Consumption at Full Implementation (ac-ft/yr)	Use Relative to 645,000 ac-ft/yr of Diverted Water*
Modified grazing leases				
50.8% in uplands	1,805	0.00	0.0	0.00%
49.2% in the floodway	1,747	0.62	1,083	0.17%
Native grasslands	1,641	0.62	1,017	0.16%
Tree planting areas				
Currently mowed areas	124.0	1.34	166	0.03%
Salt cedar areas	65.0	-1.48	-96.2	-0.01%
Open former meanders				
Currently mowed areas	54.0	4.47	241	0.04%
Salt cedar areas	88.0	3.52	-310	-0.05%
Controlled peak flows**	516	n/a	7,336	1.14%
		Total Estimate	**9,461**	**1.47%**

* Average diversion of 645,000 ac-ft/yr based on a combined average of 890 cfs along the RGCP (181 cfs at Leasburg Dam, 312 cfs at Mesilla Dam, and 397 cfs at American Dam; data from Figure 3-3).

** Assumes a maximum potential discharge of 3,700 cfs above irrigation once a month for 4 months during the early irrigation season. Each monthly water release would be limited to a 6-hour period.

Question 26. [listed as 24] The Reformulation report states that native vegetation establishment under the Targeted River Restoration alternative will occur as a result of controlled water releases from Caballo Dam during "high storage conditions in Elephant Butte Reservoir." (3-11) What is the definition of "high storage conditions?" Based on historical records, with what frequency will these storage conditions occur?

A reservoir storage near normal water surface elevation is considered "high storage conditions" which in the case of Elephant Butte has only occurred a few times over the last 60 years as indicated in Figure 4-1 (in the early 40s and from late 80s to mid 90s).

In Caballo Dam that condition is seldom reached not only because of drought conditions but also due to the operational regime that maintains relatively low water levels most of the year for flood water storage and to reduce evaporative losses. The USBR site indicates reservoir storage in 2003 has ranged from 10,000 to 70,000 ac-ft, a small fraction of the 300,000 ac-ft reservoir capacity. Given the extended drought conditions, the USBR website reported water elevations that fluctuated from 4130 ft to 4154 ft for the period January 2002 to September 2003, well below the 4177.44 normal water surface elevation (the dam hydraulic height is 78 ft.). The nominal outlet works capacity of 5,000 cfs is based on a water elevation of 4182 ft.

Question 27. [listed as 25] With regard to controlled water releases for overbank flooding (3-13), what are the flow values for "typical irrigation levels?"

Typical irrigation flows are the long-term averages that are summarized in Figure 4-4 of the Reformulation Report for various reaches of the RGCP. Data were obtained for the El Paso-Las Cruces Regional Sustainable Water Project EIS.

Question 28. [listed as 26] What is the hydrograph for the water releases for overbank flooding, i.e., duration, magnitude, frequency and timing, and rate of change in rising and recessional limbs?

A maximum theoretical 5,000 cfs steady-state discharge from Caballo Dam was modeled using the HEC-RAS model assuming typical irrigation flows (no input from tributaries), and a 1.5%/mile linear attenuation as indicated in the October 22, 2001 presentation (Appendix D). The discharge would be induced so, by definition, duration, frequency and timing would be defined by restoration targets and, more critical in practical terms, by water rights acquisition to support those discharges.

Question 29. [listed as 27] The report further states (3-13) that these discharges would be a combination of coordinated irrigation deliveries and additional water releases from the purchase of water rights. How many acre-feet of water does Parson's estimate would have to be purchased to achieve the projected overbank flooding?

What analyses have been performed to demonstrate the feasibility of coordinating irrigation flows at desired levels during optimum cottonwood seed germination periods?

Flows along the RGCP are fully controlled by irrigation requirements, so any releases for overbank flows will be superimposed on any scheduled irrigation flows. Smart use of water for overbank flows would take advantage of the highest scheduled irrigation flows near the time of the desired discharge and, thus the need for coordination.

For the DEIS preparation a target water use of 7,336 ac-ft/yr was calculated on the basis of one 6-hour discharge of 3,700 cfs (which added to an average 1,300 cfs irrigation would result in the theoretical 5,000 cfs discharge) on a monthly basis. In theory, longer or more frequent discharges would be possible to the extent that:

- Enough water rights are acquired for the releases, and the releases do not to interfere with irrigation water delivery.
- Releases are safe to downstream properties, and agreements are reached for any required conservation easements in areas where induced water releases would extend beyond the ROW.
- Extended monitoring indicate that releases are an ecologically sound and effective approach to support development of the riparian corridor along the RGCP in relation to site-specific techniques such as shavedowns, planting, and seedling development by micro-irrigation.

Feasibility of coordinating irrigation flows with controlled releases is an implementation issue to be decided each year according to water availability and by agreement with the irrigation districts that have legal ownership of the water and whose needs determine the timing and magnitude of the releases. At present the feasibility of any releases is questionable as 1) the irrigation districts have expressed opposition to those releases, a situation aggravated by the fact that farmers are facing one of the most severe droughts on record; 2) water releases would the measure with the greatest need for water acquisition (see Question 25) and currently no water rights are available for any environmental measure; and 3) Caballo Dam operational regime –maintained at the low water levels for flood control and to minimize evaporation as indicated in the response to Question 26— would not support peak discharges near the 5,000 cfs theoretical maximum value.

Question 30. [listed as 28] With regard to reopening of meanders within ROW, the report states that the structures would divert water during "high flow periods" (3-16). What is the definition of "high flow periods" and with what frequency do they occur based on historical records? What data or model was used to determine the frequency of "high flow" occurrence at river miles 105, 102, 97, 95, 92, and 54? For what duration of time and at what water levels does Parsons' estimate "backwater conditions during low flow conditions" would persist in the side channels?

The use of "high flow periods" as stated in page 3-16 is misleading and it will be changed in the DEIS. In terms of aquatic habitat diversification high flow periods refer to normal irrigation flow conditions when water velocities are far too excessive for reproduction relative to habitat preference by native fish species, as illustrated in page 4-23, Figure 4-10. The main objective of the meanders as adopted in the reformulation is to provide backwaters; such objective would be achieved by water entering into an excavated downstream section of the meander during the entire irrigation season, including the late spring and early summer, to facilitate fish reproduction. Diversions through the upstream section as a high-flow channel (as originally proposed in the AFR) would be used only once or twice a year to avoid stagnant water conditions, and would be controlled by a mechanically controlled intake structure. In this configuration, backwater availability would be limited not by the flow regime but by the extent/practicality/cost of the excavation and actual benefit as determined by long-term monitoring data from pilot studies.

Question 31. [listed as 29] On what basis/criteria were arroyos identified as having the most significant potential for diversification of aquatic habitat (3-16)?

Aquatic habitat diversification was evaluated taking into account the need for relatively deep and slow moving waters during the irrigation season as a preferred reproduction condition for native Rio Grande fish species, as illustrated in page 4-23, Figure 4-10. Monitoring data for a 3-year study of in-stream artificial structures such as V-notch weirs, embayments, and groins waters indicated that such structures were not particularly effective in increasing the diversity or abundance of fish species. That was the reasoning to focus on former meanders, and arroyos where deeper, slow-moving waters can be achieved by excavation over more extensive areas.

Question 32. [listed as 30] What role did/does IBWC play in the construction and maintenance of sediment retention dams on arroyos in the Canalization Project. The report indicates that USIBWC requested NRCS to construct sediment control dams at 4 arroyos (4-12). Can you provide more information about the nature of these requests and whether IBWC funding/in-kind services were used for their construction?

The Sediment Control Dams at tributary arroyos were constructed to reduce flood peaks and sediment inflows into the Rio Grande, thereby reducing the average annual maintenance cost for the Canalization Project. These structures are authorized by: Public Law 88-600, September 18, 1964, 78 Stat. 956; 22 U.S.C. 277d-29, amended by Act of October 18, 1973, Public Law 93-126, 87 Stat. 451.

The USIBWC requested the Soil Conservation Service (SCS, now the Natural Resource Conservation Service), Department of Agriculture, in 1960 to make reconnaissance studies of means of controlling the sediment inflow from tributary streams into the Canalization Project in the Rincon Valley and into the Selden Canyon in order to reduce

project maintenance costs to economic levels. The SCS found that flood and sediment retention dams could be considered under its Public Law 566 program for 11 arroyos tributary to the Rio Grande between Caballo and Leasburg Diversion Dams.

In recognition of the savings in maintenance cost for sediment removal from the Canalization Project, by virtue of construction of the dams, the Congress by Public Law 88-600 authorized the USIBWC to enter into contracts with local organizations for maintenance of such dams. The SCS then proceeded under its program with surveys and construction as found justified.

Between 1969 and 1975, five dams were completed on four arroyos. They are designed, with one exception, to provide sufficient storage capacity to contain an estimated 100 years of sediment inflow and to control the estimated 100-year flood. The exception (Broad Canyon) is designed to contain 100 years of sediments and control an estimated 50-year flood. These dams control flood runoff to the Canalization Project from 39 percent of the watershed upstream from Leasburg Dam.

Soil Conservation Service, PL 566 Projects, 1975 Conditions

		DRAINAGE AREA	CAPACITY IN ACRE-FEET			HEIGHT
ARROYO/DAM	COMPLETED	REGULATED, SQ.MI.	SEDIMENT	FLOOD	TOTAL	FEET.
BROAD CANYON, NO. 1	1969	64	2,625	3,405	6,030	70.5
CROW CANYON, NO. 2A	1971	120	3,945	7,384	11,329	65.5
GREEN ARROYO, NO. 1A	1972	31	1,320	1,612	2,932	90.2
JARALOSA ARROYO NO. 4	1975	86	3,427	2,891	6,318	91.5
JARALOSA ARROYO NO. 5	1975	6	389	327	716	27.5
TOTAL		307	11,706	15,619	27,325	-

The Local interests sponsoring the SCS projects are the Elephant Butte Irrigation District and the Caballo Natural Resource Conservation Service District. The USIBWC in cooperation with the two local interest districts maintains the dams, outlet works, and access roads.

Under an agreement with the Elephant Butte Irrigation District and Caballo Natural Resource Conservation Service District, IBM 65-356 dated December 10, 1965, and Supplement No. 1 dated February 15, 1974, the USIBWC performs maintenance of the constructed works. A joint annual inspection including the Caballo Natural Resources Conservation District, Elephant Butte Irrigation District, New Mexico State Engineer's Office, and USIBWC is made for the purpose of reviewing the maintenance needs. Public Law 93-126; 87 Stat. 451, approved October 18, 1973, limits the USIBWC maintenance activities to $50,000 per year.

Question 33. [listed as 31] What is the legal basis for saying that environmental water use will require project reauthorization (4-2)?

The statement in page 4-2 reads "Authorization changes are also likely for Rio Grande Project water use in habitat improvements " not "*environmental water use will require project reauthorization.*"

Changes in Rio Grande Project water use do require authorization by USBR and agreements with the irrigation districts. Under a Congressional Law (Sale of Water for Miscellaneous Purposes Act) enacted February 25, 1920, the Secretary of the Interior can sell Rio Grande Project water for purposes other than irrigation as long as the following three criteria are met (2000 Water Resources Technical Report, page 3-49, El Paso-Las Cruces Regional Sustainable Water Project):

- The affected irrigation districts must approve the sale
- Sale cannot be detrimental to the Rio Grande Project
- There can be no other practicable source of water

There is a 1998 authorization by the USBR to EPCWID#1 for water rights conversion from irrigation to water supply for the City of El Paso and the Lower Mesilla Water District (that supersedes a 1941 agreement). However, there is no precedent of an USBR authorization for Rio Grande Project water use in environmental measures.

34. [listed as 32] Can you explain the position taken in the report that "use of non-structural flood control methods in the RGCP is primarily an economic and risk-management decision?" (4-17)

(see also response to Q 19).
As indicated in page 4-17, and discussed at length in Section 4.3.3 and previous correspondence RGCP conditions, unlike other types of riverine systems, offer few opportunities to combine non-structural flood control (namely levee relocation) and river restoration measures. Under these conditions use of in-place levee rehabilitation versus levee relocation is simply an engineering decision based on 1) economic considerations as determined by a cost-benefit analysis (structure condition, options for relocation), and 2) a risk management analysis for protection against flood for given the probability of flood occurrence.

Question 35. [listed as 33] What role did IBWC play in the construction of Caballo Dam? Was the dam constructed, in part or whole, at the request of IBWC? Did IBWC funding/in-kind services contribute to the cost of construction?

A Memorandum of Agreement was signed October 9, 1935 between Department of State and Department of Interior, pursuant to the provisions of the Act approved May 21, 1930 (U.S.C., Title 31, Sec. 686) as amended by Section 601 of the Act approved June 30, 1932 (U.S.C., Suppl. VII, Sec. 686), and the Convention for the Rectification of the Rio Grande of February 1, 1933, between the United States and Mexico (48 Stat. 1621).

Provision was made by the Convention and attached annexes for the Rio Grande Rectification Project in the El Paso-Juarez Valley for construction by the United States, under the direction and inspection of the International Boundary Commission, United States and Mexico, of a flood control and channel stabilization project including a flood control detention dam and reservoir of not less than 100,000 acre feet capacity at Caballo, New Mexico. The cost of construction of the dam and reservoir was estimated to be $1,500,000, and these funds were allotted to the Department of State pursuant to the provisions of Title II of the Act approved June 16, 1933.

The Bureau of Reclamation, needing a high dam rather than the low dam envisioned by the IBWC, applied for and received an allotment of funds under Title II of the Act approved June 16, 1933 in the sum of $100,000 and under the Relief Appropriation Act of 1935, approved April 8 1935, an allotment of funds in the sum of $900,000 for the construction of a high dam for the creation of a reservoir for development of hydroelectric power.

Caballo Dam was constructed from 1936 to 1938 as part of the Rectification Project. The dam, located 25 miles downstream from Elephant Butte, was included as a flood control unit in the Rio Grande Rectification Project and part of its cost was allocated to that purpose. This is an earth fill, rock faced structure 96 feet high and 4,590 feet long. It made year-round power generation at Elephant butte Dam possible and part of the cost was allocated to that purpose, but it also provided replacement for storage lost at Elephant Butte due to silt deposition.

Elephant Butte power plant was constructed between 1938 and 1940. Water used for winter generation of power at Elephant Butte is held in Caballo Reservoir in storage for irrigation use during the summer. Construction of the power transmission system, begun in 1940, was completed in 1952 (Dept. of Int. 1981. Water and Power Resources Service, Project Data. pp. 1049-1062. USGPO, Denver; Bureau of Rec. 1970. Factual Data about the Rio Grande Project. Reg. Dir. Region 5, Amarillo.)

Since completion of construction in 1938, as agreed in the 1935 MOA, Caballo Dam and Reservoir have been operated and maintained by the Bureau of Reclamation.

Question 36. [listed as 34] What was the basis/justification for not considering reworking of the channel geometry to create low velocity habitat for aquatic habitat diversification?

Reworking of the channel to create low velocity habitat leads to inefficiency in water delivery, a measure that is in conflict with the Congress-mandated RGCP mission. For this reason the inclusion of such a measure in the alternatives (partial decommissioning of the RGCP) was removed from further consideration in the EIS.

As an alternative, off-channel changes are under consideration to create relatively deep habitats with low velocity waters during the irrigation season in arroyos and meanders (see response to Questions 30 and 31). Shallow habitat with slow-moving water and ponding is widely available in the main channel during the four-month non-irrigation season.

Question 37. [listed as 35] Is it possible to get copies of the following technical reports:

a. *Technical Report, HEP and WHAP Surveys for Evaluation of Aquatic and Wildlife Habitat, Rio Grande Canalization Project, Parsons, June 2001*

b. *Threatened and endangered species final report, USIBWC Rio Grande Canalization EIS, Parsons, April 2000*

c. *Final Threatened and Endangered Species Survey Technical Report, Rio Grande Canalization Project, Parsons, February 2001*

Copies of those reports will be provided in CD format.

ATTACHMENT A

The following table lists the 48 environmental enhancement sites initially identified in the AFR and modifications made in the reformulation.

	AFR Site Name within ROW	Project	AFR Measures Revised in Reformulation of Alternatives
1	Oxbow Restoration Site (6 acres)	Retained as a point project (6.6 ac)	Meander restoration project unchanged from AFR. A 1-acre wetland enhancement identified in AFR contained within meander opening. No-mow zones replaced with native grasslands and modified grazing. In stream aquatic structures deleted. Creation of wetlands during meander construction increased from 1 ac in AFR to an estimated 2 ac (20% of meander) in reformulated measure.
2	Tipton Arroyo (14 acres)	Retained as a point project (5.9 ac) and linear project component	Shave down project unchanged, however the extent of the project modified (reduced from 5 ac to 3.4) to be contained within hydrologic floodplain. No-mow zones replaced with native grasslands and modified grazing. Expansion of remnant Bosque (east side of river) replaced with Bosque enhancement and project size reduced from 8 ac to 2.5 ac to be consistent with hydrologic floodplain boundary. Creation of wetlands as a result of shave downs reduced from 1 ac proposed in AFR to an estimated 0.2 ac (10% of shave downs) in reformulated measure. AFR actions of instream aquatic structures and widening channel replaced by modified dredging in arroyos. Purchasing of 74 ac identified in AFR eliminated during reformulation.
3	Trujillo Arroyo (12 acres)	Expanded to 26.5 ac	Project measure changed from plantings to shave downs and expanded from 10 ac proposed in AFR to 26.6 ac under reformulation. Creation of wetlands as a result of shave downs increased from 2 ac proposed in AFR to an estimated 2.6 ac (10% of shave downs) in reformulated measure. No-mow zones replaced with native grasslands and modified grazing. AFR actions of instream aquatic structures and widening channel replaced by modified dredging in arroyos. Purchasing of 55 ac identified in AFR eliminated during reformulation.
4	Montoya Arroyo (12 acres)	Expanded to 27.5 ac	Project measure changed from plantings to shave downs and expanded from 10 ac proposed in AFR to 24.7 ac under reformulation. A 2.83 ac meander opening replace the 5 ac channel split identified in AFR. Creation of wetlands as a result of shave downs increased from 2 ac proposed in AFR to an estimated 2.5 ac (10% of shave downs) in reformulated measure. Creation of additional wetlands as a result of meander opening estimated at 0.5 ac (20% of meander opening) in reformulated measure. Native grasslands and modified grazing replace AFR action of discontinuing leases and enhancing wetlands. AFR actions of instream aquatic structures and widening channel replaced by modified dredging in arroyos. Land purchases eliminated.
5	Holguin Arroyo (22 acres)	Retained as a point project but reduced to 18.5 ac	Project measure changed from plantings to a combination of shave downs and plantings and reduced from 20 ac proposed in AFR to 18.6 ac under reformulation in order to be contained within hydrologic floodplain. Native grasslands and modified grazing replace AFR action of discontinuing leases and 2 acres of enhancing wetlands. AFR actions of instream aquatic structures replaced by modified dredging in arroyos
6	Green / Tierra Blanca (23 acres)	Retained as a point project but reduced to 5.1 ac	Original project reduced from 23 ac (20 ac planting and 3 ac of bosque enhancement) to 5 ac in order to remain within hydrologic floodplain. A 5.1 ac meander opening replace the 3-ac channel split identified in AFR Native grasslands and modified grazing replace AFR action of discontinuing leases and 2 acres of enhancing wetlands. AFR actions of instream aquatic structures replaced by modified dredging in arroyos.

7	Sibley Arroyo Point Bar (12 acres)	Retained as a point project (4.1 ac) and linear project component	Original project reduced from 10 ac of planting to a 4.1 ac shave down. Native grasslands and modified grazing replace AFR action of discontinuing leases and 2 acres of enhancing wetlands. AFR actions of in stream aquatic structures replaced by modified dredging in arroyos. The 2-ac channel split identified in AFR eliminated.
8	Jaralosa Arroyo (75 acres)	Retained as a point project (28 ac) and linear project component	Original project reduced from 70 ac (60 ac of planting and 20 ac of bosque enhancement) to 5.1 ac of plantings under the reformulation (in order to be contained within hydrologic floodplain). A 20 ac channel spilt identified in AFR was replaced by 2 opening of meanders projects for a total of 33.1 ac. The opening of meanders would result in 6.6 ac of wetlands. Native grasslands and modified grazing replaced AFR action of discontinuing leases and 5 acres of enhancing wetlands. AFR actions of instream aquatic structures was replaced by modified dredging in arroyos. Purchasing of 355 ac identified in AFR eliminated during reformulation.
9	Yeso Arroyo (22 acres)	Retained as a point project (15.4 ac) and linear project component	Original 20 ac bosque enhancement project reduced to a 3.9 ac shave down under the reformulation (in order to be contained within hydrologic floodplain). A 10 ac channel spilt identified in AFR was replaced by 11.5 ac of plantings. Native grasslands and modified grazing replaced AFR action of discontinuing leases and 2 acres of enhancing wetlands. AFR actions of instream aquatic structures were replaced by modified dredging in arroyos.
10	Crow Canyon (52 acres)	Expanded to 102.5 ac	Original project reduced from 50 ac (20 ac of planting and 30 ac of bosque enhancement) to 17.9 ac shave down under the reformulation (in order to be contained within hydrologic floodplain). A 40 ac channel spilt identified in AFR was replaced by an 84.6 ac opening of meanders project. The opening of meanders would result in 16 ac of wetlands. Native grasslands and modified grazing replaced AFR action of discontinuing leases and 2 acres of enhancing wetlands. AFR actions of instream aquatic structures were eliminated.
11	Hatch Siphon (3 acres)	Retained as a linear project component	Native grasslands and modified grazing replaced AFR action of discontinuing leases and 3 acres of enhancing wetlands.
12	Wetlands Unit B (10 acres)	Retained as a linear project component	10 ac wetland enhancement identified in AFR replaced with native grasslands and modified grazing.
13	Wetlands Unit A (10 acres)	Retained as a linear project component	10 ac wetland enhancement identified in AFR replaced with native grasslands and modified grazing.
14	Garfield Drain (5 acres)	Retained as a linear project component	Bosque enhancement replaced with native grasslands and modified grazing. AFR actions of instream aquatic structures were eliminated. Native grasslands and modified grazing replaced AFR action of no mow zones.
15	Placitas Arroyo (12 acres)	Retained as a linear project component	Bosque enhancement within arroyo drain replaced with native grasslands. Conservation easement replaced acquisition of 132 of farmland. Native grasslands and modified grazing replaced AFR action of no mow zones 2 acres of enhancing wetlands.
16	Remnant Bosque/Rincon (22 acres)	Expanded to 34.1 ac	Original project increased from 20 ac (10 ac of planting and 10 ac of bosque enhancement) to 34.1 ac (17.9 ac shave down and 16.2 ac planting under the reformulation). Conservation easement used in place of acquisition of a 91-ac remnant bosque tract. The purchase of two small cropped tracts (18 ac) eliminated. Native grasslands and modified grazing replaced AFR action of no mow zones and 2 acres of enhancing wetlands. Modified dredging in arroyos added as a measure.

17	Angostura Arroyo (10 acres)	Retained as a linear project component	Original project of enhancing 10 acres of bosque eliminated (outside hydrologic floodplain). AFR actions of instream aquatic structures were eliminated. Native grasslands and modified grazing replaced AFR action of no mow zones. Conservation easement replaced acquisition of 43 ac of adjacent lands.
18	Rincon/Reed Arroyo (7 acres)	Retained as a point project (2.74 ac) and linear project component	Original 5-ac project eliminated (outside hydrologic floodplain). Native grasslands and modified grazing replaced no-mow zones and 2 acres of enhancing wetlands. AFR actions of instream aquatic structures were replaced by modified dredging in arroyos.
19	Bignell Arroyo (17 acres)	Expanded to 26.6 ac	Original project increased from 5 ac to 26.6 ac (16.3 ac shave down and 10.3 ac planting under the reformulation). A 26 ac conservation easement added. Native grasslands and modified grazing replaced AFR action of no mow zones and 12 acres of enhancing wetlands. AFR actions of instream aquatic structures were replaced by modified dredging in arroyos.
	Bufford Property (0 acres)	Added as a linear project component	Not part of the AFR. Conservation easements added during reformulation. A total of 219 ac with a large amount of wetlands 20-40 ac located in conservation easements.
20	Dead Man's Curve (59 acres)	Retained as conservation easement and expanded	Retained as a conservation easement. Conservation easements expanded in the Seldon Canyon RMU from 106 ac to 808 ac
21	Broad Canyon (47 acres)	Retained as conservation easement and expanded	Retained as a conservation easement. Conservation easements expanded in the Seldon Canyon RMU from 106 ac to 808 ac
22	Leasburg Dam (4 acres)	Retained	The addition of a 4 ac park identified in AFR reformulated retained as part of an overall agency cooperative agreement program.
23	West Side (64 acres)	Retained as a linear project component	Original 60-ac bosque enhancement projects deleted as a result of being outside hydrologic floodplain. Modified grazing replaced AFR action of discontinued grazing and 4 acres of enhancing wetlands. AFR actions of instream aquatic structures eliminated.
24	Levee Setback (11 acres)	Retained as a linear project component	Original 10 ac planting project deleted as a result of being outside hydrologic floodplain. Modified grazing replaced AFR action of discontinued grazing and 1 acre of enhancing wetlands. AFR actions of instream aquatic structures eliminated. Levee set back and subsequent opening meander outside the ROW no longer considered in the reformulation. The current levee exceeds 100-year flood containment capacity as calculated from hydraulic modeling and fully functional levees (structural integrity analyses not withstanding) would not be removed for the sole purpose of environmental enhancement.
25	Seldon Drain (3 acres)	Retained as a linear project component	3 acre wetland enhancement replaced with native grasslands and modified grazing. AFR actions of instream aquatic structures eliminated.
26	Channel Cut (20 acres)	Retained as a point project (19.6 ac)	Original 20-ac bosque enhancement project deleted as a result of being outside hydrologic floodplain. The original 23-ac channel split changed to a 19.6 ac meander opening (or planting) in the reformulation. Native grasslands and modified grazing replaced the AFR action of discontinued leases.

27	Wasteway No. 2A (3 acres)	Retained as a linear project component	Original no-mow zone, 2 acre of enhancing wetlands and 1 acre of planting replaced with native grasslands and modified grazing. AFR actions of instream aquatic structures eliminated.
28	Wasteway No. 5 (7 acres)	Retained as a linear project component	Original 5 ac planting and 2 ac wetland enhancement project deleted as a result of being outside hydrologic floodplain. Native grasslands and modified grazing replaced AFR action of additional no mow zones. Reduced maintenance of drains retained as part of a native grasslands/modified grazing measure. AFR actions of instream aquatic structures eliminated.
29	Wasteway No. 39 (8 acres)	Expanded to 15.9 ac	Original 6 ac planting and 2 ac wetland enhancement project increased to 15. 9 ac planting under reformulation. Native grasslands and modified grazing replaced AFR action of additional no mow zones. Reduced maintenance of drains retained as part of a native grasslands/modified grazing measure. AFR actions of instream aquatic structures eliminated.
30	Wasteway No. 8 (8 acres)	Expanded to 34.6 ac	Original 5 ac planting (and 3 ac wetland enhancement) project increased to 34.6 ac planting under reformulation. Native grasslands and modified grazing measure added. Reduced maintenance of drains retained as part of a native grasslands/modified grazing measure. AFR actions of instream aquatic structures eliminated.
31	Wasteway No. 39A (1 acres)	Retained as a linear project component	1-acre wetland enhancement and No-mow zones replaced with native grasslands and modified grazing. AFR actions of instream aquatic structures eliminated. Reduced maintenance of drains retained as part of a native grasslands/modified grazing measure. Land acquisition eliminated in favor of a conservation easement of remnant bosque on east side.
32	Clark Lateral (10 acres)	Expanded to 15.4 ac	15.4 ac of woody plantings added under reformulation. Native grasslands added as a measure and replaced 10 ac wetland enhancements. Reduced maintained of nearby drain as part of a native grasslands measure.
33	NMGF Bosque (Picacho Bosque) (9 acres)	Expanded to 71.3 ac	71 ac of plantings added under reformulation. 9 ac wetland enhancement replaced with native grasslands. Native grasslands replaced 40 ac of reduced maintenance under AFR. Original 114 ac of land acquisition eliminated in favor of 181 ac of conservation easements and 19-ac agency cooperative agreement (NMGF). Levee set back and the subsequent opening of a former meander outside the ROW was eliminated in reformulation for two reasons, 1) the majority of the levee in the vicinity of the meander currently contain the 100 year flood within 3 feet for freeboard and 2) significant amounts of wetlands (wet meadow community) are located in the former meander site and represent a fairly unique and limited community in the RGCP.
34	Mesilla Dam (10 acres)	Retained	Backwater habitat will still be created as a result of siphon/structure protection; no longer considered a measure, but rather an effect.
35	Pole Planting Area (5 acres)	Retained as a linear project component	Original 5 ac of pole plantings and no- mow zones identified in AFR replaced with native grasslands and modified grazing. AFR actions of instream aquatic structures eliminated.
36	Wasteway No. 18 (5 acres)	Retained as a linear project component	Original 5 ac of pole plantings and no- mow zones identified in AFR replaced with native grasslands and modified grazing. AFR actions of instream aquatic structures eliminated. Reduced maintained of drains retained as part of a native grasslands/modified grazing measure. Levee set back and subsequent opening meander outside the ROW eliminated in reformulation. Levee freebooard is adequate for 100-year flood containment capacity as calculated from hydraulic modeling and fully functional levees (structural integrity analyses not withstanding) would not be removed for the sole purpose of environmental enhancement.

37	Old Channel Cut (7 acres)	Retained as a linear project component	Original 5 ac of pole plantings, 2 ac of wetland enchantment and 16 acres of no- mow zones identified in AFR replaced with native grasslands and modified grazing. AFR actions of instream aquatic structures eliminated. Reduced maintained of drains retained as part of a native grasslands/modified grazing measure. Land acquisition not longer under consideration. Levee set back and subsequent opening meander outside the ROW eliminated in reformulation. Levee freebooard is adequate for 100-year flood containment capacity as calculated from hydraulic modeling and fully functional levees (structural integrity analyses not withstanding) would not be removed for the sole purpose of environmental enhancement.
38	Del Rio drain (5 acres)	Retained as a linear project component	Original 5 ac of pole plantings and no- mow zones identified in AFR replaced with native grasslands and modified grazing. AFR actions of instream aquatic structures eliminated. Reduced maintained of drains retained as part of a native grasslands/modified grazing measure. Levee set back and subsequent opening meander outside the ROW eliminated in reformulation. Levee freebooard is adequate for 100-year flood containment capacity as calculated from hydraulic modeling and fully functional levees (structural integrity analyses not withstanding) would not be removed for the sole purpose of environmental enhancement.
39	Wasteway No. 19 (4 acres)	Retained as a linear project component	Original 3 ac of wetland creation and 1 ac of wetland enhancement identified in AFR replaced with native grasslands and modified grazing. Reduced maintained of drains retained as part of a native grasslands/modified grazing measure.
40	Wasteway Nos. 31 and 20 (5 acres)	Retained as a linear project component	Original 5 ac of wetland creation identified in AFR replaced with native grasslands and modified grazing. Reduced maintained of drains retained as part of a native grasslands/modified grazing measure.
41	Jimenez and Three Saints Lateral (2 acres)	Retained as a linear project component	Modified grazing replaced no-mow zones and 2 ac of wetland enhancement. Reduced maintenance of drains/laterals retained as part of modified grazing measure. AFR actions of instream aquatic structures eliminated.
42	East Drain (12 acres)	Retained as a linear project component	Planting of 10-ac site identified in AFR not longer under consideration due to potential levee deficiencies. Modified grazing replaced no-mow zones and 2 ac of wetland enhancement. Reduced maintained of drains/laterals part of modified grazing measure. Land purchase eliminated in favor of conservation easement.
43	Wasteway No. 34 (1 acres)	Not retained	Planting of 1-ac site identified in AFR not longer under consideration due to potential levee deficiencies. AFR actions of instream aquatic structures eliminated. Continued avoidance of native vegetation by mowers maintained.
44	Wasteway No. 35 (5 acres)	Not retained	Planting of 4-ac site and 1 acre wetland enhancement identified in AFR not longer under consideration due to potential levee deficiencies. AFR actions of instream aquatic structures eliminated. Continued avoidance of native vegetation by mowers maintained.
45	Nemexas Drain (1 acres)	Not retained	AFR actions of in-stream aquatic structures and 1 acre wetland enhancement eliminated. Continued avoidance of native vegetation by mowers maintained.
46	Sunland Park (10 acres)	Not retained	Planting of 10-ac site identified in AFR not longer under consideration due to potential levee deficiencies. Continued avoidance of native vegetation by mowers maintained.
47	Cottonwood Grove	Not retained	Project identified in AFR not longer under consideration due to potential levee deficiencies. Continued avoidance of native vegetation by mowers

	(3 acres)		maintained.
48	Anapra Bridge (0 acres)	Not retained	Land purchase outside ROW not longer under consideration.

ATTACHEMENT B
Flow Data Used for Selection of Reference Conditions for Riparian Corridor Development

TABLE 2-2

10-YR. HIGH FLOW PERIOD MEAN MONTHLY FLOW DATA FOR THE LEASBURG SUBREACH

WATER YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
						(FROM SECTION 628 TO SECTION 861)						
1983	56	48	47	38	178	1185	1050	1263	1512	1702	1556	1168
1984	139	61	41	31	267	1339	1303	1415	1498	1892	1052	1277
1985	214	54	64	46	47	1104	1177	1430	1742	1855	1542	1067
1986	484	79	66	515	1401	1870	1596	2020	2363	2978	2206	1401
1987	2049	1490	2337	1961	1942	2496	2364	3189	2699	3470	1696	972
1988	510	133	114	111	354	2163	1983	1638	1995	1929	1548	1038
1989	356	80	50	34	303	1841	1190	1419	2027	2061	1538	1030
1990	100	66	51	43	170	1601	1078	1283	2013	1836	1190	1164
1991	151	66	40	34	157	1549	1025	1207	2048	2289	1539	1136
1992	552	281	389	347	580	1746	1464	1700	2048	2289	1539	1136
AVERAGE	461	236	320	316	540	1689	1423	1656	1995	2230	1541	1139
						(FROM SECTION 861 TO SECTION 1050)						
1983	1	1	1	1	192	1202	985	1230	1485	1678	1526	1014
1984	23	1	1	2	299	1352	1203	1328	1319	1791	832	1212
1985	51	2	2	2	60	1078	1136	1320	1637	1705	1379	929
1986	266	25	18	473	1330	1759	1530	1912	2263	2763	2032	1264
1987	1917	1384	2379	1893	1779	2413	2319	3071	2694	3561	1555	823
1988	348	73	72	66	326	2418	1929	1488	1926	1780	1225	916
1989	176	2	2	2	242	1780	1092	1308	1950	1889	1236	813
1990	3	2	2	2	175	1602	999	1237	1959	1651	1099	939
1991	7	2	2	1	166	1507	980	1208	1692	1367	1010	723
1992	281	2	2	173	391	1484	1156	1093	1629	1787	1340	1131
AVERAGE	307	149	248	262	496	1660	1333	1520	1855	1997	1323	976
	CALCULATED DATA (cfs) FOR HEC-6 INPUT ON Q CARDS - DIFFERENCES FROM ABOVE - REQUIRED TO CHANGE DISCHARGE AT SECTION 861											
AVERAGE	154	86	72	54	44	30	90	137	139	233	217	163

See Appendix D for supporting computations.

TABLE 2-4

10-YR. HIGH FLOW PERIOD MEAN MONTHLY FLOW DATA FOR THE MESILLA SUBREACH (LOCATED BETWEEN MESILLA DIVERSION DAM AND LEASBURG DIVERSION DAM)

WATER YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
						(FROM SECTION 405.4 TO SECTION 499)						
1983	47	48	51	39	160	985	777	997	1203	1422	1254	876
1984	118	61	45	32	235	1083	1061	1140	1248	1639	893	957
1985	171	54	71	47	42	934	937	1140	1469	1602	1286	801
1986	407	79	72	451	1078	1573	1308	1687	2174	2805	1891	1075
1987	1983	1487	2566	2016	1507	2142	2060	2816	2455	3270	1382	655
1988	379	133	125	114	226	1873	1717	1300	1664	1618	1254	744
1989	264	77	55	35	229	1488	893	1075	1670	1742	1320	801
1990	102	66	56	45	153	1340	852	1000	1717	1614	979	890
1991	141	66	44	35	86	1285	766	910	1346	1147	956	618
1992	253	77	81	176	291	1240	965	989	1437	1627	1164	868
AVERAGE	387	215	317	299	401	1394	1134	1305	1638	1846	1238	828
						(FROM SECTION 499 TO SECTION 626)						
1983	47	48	47	38	178	988	757	993	1136	1320	1200	882
1984	116	61	41	31	262	1086	1034	1136	1179	1521	855	963
1985	168	54	65	46	47	936	913	1136	1387	1487	1231	806
1986	400	79	66	439	1201	1577	1275	1680	2053	2604	1810	1082
1987	1948	1490	2337	1961	1678	2148	2008	2805	2319	3035	1323	659
1988	372	133	114	111	252	1878	1674	1295	1572	1502	1200	749
1989	259	77	50	35	255	1492	870	1071	1577	1617	1263	806
1990	100	66	51	43	170	1343	830	996	1622	1498	937	895
1991	139	67	40	34	96	1288	747	906	1271	1037	915	622
1992	249	77	74	171	324	1243	941	985	1357	1510	1114	874
AVERAGE	380	215	288	291	446	1398	1105	1300	1547	1713	1185	834
						CALCULATED DATA (cfs) FOR HEC-6 INPUT ON Q CARDS - DIFFERENCES FROM ABOVE - REQUIRED TO CHANGE DISCHARGE AT SECTION 499						
AVERAGE	7	0	28	8	-46	-4	29	5	91	132	53	-5

See Appendix D for supporting computations.

TABLE 2-6

10-YR. HIGH FLOW PERIOD MEAN MONTHLY FLOW DATA FOR THE EL PASO SUBREACH (LOCATED BETWEEN AMERICAN DIVERSION DAM AND MESILLA DIVERSION DAM)

WATER YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
					(FROM SECTION 1 TO SECTION 217)							
1983	192	124	131	86	165	556	517	606	658	879	877	624
1984	286	142	81	68	187	547	594	718	765	897	892	616
1985	345	148	147	110	85	509	568	646	765	885	866	675
1986	509	185	129	378	921	1097	917	1127	1589	2265	1533	1035
1987	2159	1696	2602	1978	1785	1852	1883	2592	2108	2586	1325	807
1988	477	263	183	175	238	1409	1347	1041	1222	1241	1226	753
1989	407	188	151	121	183	886	687	799	1084	1173	985	631
1990	263	140	110	85	133	823	608	624	1030	1092	696	736
1991	336	178	126	91	97	738	552	589	839	1003	876	675
1992	314	181	178	280	304	944	777	834	940	1031	967	779
AVERAGE	529	325	384	337	410	936	845	958	1100	1305	1024	733
					(FROM SECTION 217 TO SECTION 405.2)							
1983	69	44	44	45	94	508	360	462	573	850	892	469
1984	103	51	27	36	107	499	413	548	667	867	908	463
1985	124	53	50	29	35	360	365	461	582	768	523	313
1986	215	69	43	281	745	1033	755	1132	1628	2178	1234	419
1987	1743	1430	2392	1870	1339	1572	1496	2373	1764	2545	627	203
1988	116	100	119	107	121	1526	1295	655	981	806	739	341
1989	138	85	64	54	86	805	376	587	1010	1033	895	354
1990	126	82	66	47	154	848	414	483	933	1048	553	365
1991	120	70	52	38	28	735	357	446	763	808	658	307
1992	82	81	80	143	136	742	483	556	624	855	685	414
AVERAGE	284	206	294	265	284	863	631	770	953	1176	771	365
	CALCULATED DATA (cfs) FOR HEC-6 INPUT ON Q CARDS - DIFFERENCES FROM ABOVE - REQUIRED TO CHANGE DISCHARGE AT SECTION 217											
AVERAGE	245	118	90	72	125	73	214	187	147	129	253	368

See Appendix D for supporting computations.

EBID

Elephant Butte Irrigation District
Of New Mexico

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9-006

September 13, 2003

Ms. Debra Little, Acting U.S. Commissioner
International Boundary and Water Commission
4171 North Mesa Street
El Paso, Texas 79902-1441

Dear Acting Commissioner Little,

Over the years the Elephant Butte Irrigation District has sought to cooperate and to work with the International Boundary and Water Commission (IBWC). Often in the past we have joined together on shared interests and our history of common concerns goes back almost 100 years. It has been a fruitful and valuable association.

Our view of the U.S. Section of the International Boundary and Water Commission is that it is a federal commission, within the U.S. State Department, that has specific, limited responsibilities. We believe that the activities of the U.S. Commission should be carried out in a fair and even handed style and that, within the continental U.S., that the Commission should be neutral, and should not take sides or give aid to any party when there is an adversarial disagreement between two U.S. parties that share common responsibilities with respect to the management of the water resources of the Rio Grande.

During the past year or so the U.S. Section has been involved in to two activities that we believe are prejudicial to best interests of the Elephant Butte Irrigation District (EBID) and to the State of New Mexico. I have asked our staff to prepared an "Issue" paper on each and have attached them to this letter. We believe both to be serious and both to be related to the U.S. Section's view of the Agency's "environmental" authority. We understand that the U.S. Section's environmental duties stem from the U.S. – Mexico Treaty of 1944 and subsequent agreements between the two countries as recorded in IBWC minutes.

We understand that the IBWC "environmental" powers are based on Article 3 of the 1944 Treaty that states that uses of international waters "shall be subject to any sanitary measures or works which may be mutually agreed upon" and that the IBWC should "give preferential attention to the solution of border sanitation problems." We find that the activities presented in our "Issue" papers go well beyond "border sanitation problems." We believe that the Agency's actions in these cases pose a potential detriment to the interests of the District and to New Mexico and that these actions verge on being violations of the intent of a provision of the U.S. Senate in the ratification of the Treaty of 1944. Condition (c) in the Senates ratification resolution states that:

> "nothing contained in the treaty or protocol shall be construed as authorizing the Secretary of State of the United States, the Commissioner of the United States Section of the International Boundary and Water Commission, or the United States Section of said Commission, directly or indirectly, to alter or control the distribution of water to users within the territorial limits of any of the individual states".

We believe that the U.S. Section activities outlined in our two Issue papers may have, and will continue to have the potential effect of directly and/or indirectly altering the distribution of the water supply of the Rio Grande in Texas and New Mexico. Clearly, this is a serious concern and one that we believe can best be resolved by a fundamental reordering of some of the environmental activities of the U.S. Section. After you and your staff have had an opportunity to review our Issue papers, we will be pleased to schedule a meeting with you. As we believe that treaty ratification conditions of the U.S. Senate are at risk, we will also invite New Mexico Congressional staff to join us.

Sincerely

Gary Arnold, President
Elephant Butte Irrigation District

Copies To: The Honorable Pete Domenici, U.S. Senator from New Mexico
The Honorable Jeff Bingaman, U.S. Senator from New Mexico
The Honorable Steve Pearce, U.S. Representative,
2nd Congressional District
The Honorable Patricia Madrid, New Mexico Attorney General

ISSUE I

U.S. Section's Representation For The State Of Texas

U.S. Section Activity

In October 1998 the U.S. Section of the International Boundary Commission (IBWC) entered into a contract with the State of Texas to implement the Texas Clean Rivers Program (TCRP) on the Pecos River and on the Rio Grande in Texas. The authority of the Texas Clean River Program has been extended up the Rio Grande to Anthony, Texas, the point where the river first crosses into Texas. The Rio Grande moves back and forth between states four or five times before reaching the end of river for the purpose of New Mexico's stream standards; that is, at the International Dam. Acting for the State of Texas, under the aegis of the TCRP, the U.S. Section has issued a publication and held public meetings that site activities in New Mexico as being responsible for salinity in the Rio Grande. In representing the State of Texas and it taking these actions, the U.S. Section has put itself in a potentially adversarial position, pitting a federal commission against the interests of the State of New Mexico and the Elephant Butte Irrigation District. We believe that by contracting to represent the State of Texas, that the U.S. Section can not meet the test of being "fair and even-handed" with all parties, and that it may have acted, directly and/or indirectly, to prejudice threatened litigation dealing with water quality issues between the State of Texas and the State of New Mexico.

Authority For U.S. Section Actions

The IBWC environmental and water quality responsibilities are based on Article 3 of the 1944 Treaty between the U.S. and Mexico. Article 3 states that the International Boundary and Water Commission "may be called upon to make provisions for joint use" of water. The Treaty language continues with an ordered list of "preferences" for the use of "international waters". This set of preferences is to serve as a guide for IBWC actions. Article 3 continues with the statement that all of the "foregoing uses shall be subject to any sanitary measures or works which may be mutually agreed upon" and that the IBWC should "give preferential attention to the solution of border sanitation problems."

The IBWC has authorized further water quality investigations and activities on the Rio Grande in the El Paso-Juarez area by agreements in Commission Minutes as follows:

- Minute No. 261 of September 24, 1979 defined the term "border sanitation problems" to include "sanitary conditions that present a hazard to the health and well-being of the inhabitants of either side of the border or impair the beneficial uses of these waters".

- Minute No. 289 of November 13, 1992 dealt with water quality monitoring for the purpose of determining the presence of toxic substances in the Rio Grande from El Paso-Juarez to the Gulf of Mexico.
- Minute No. 294 of November 24, 1995 dealt with relations with the Border Environment Cooperation Commission (BECC) and planning for domestic water systems and wastewater treatment infrastructure.
- Minute No. 299 of December 3, 1998 again dealt with BECC sanitation projects and noted that "all activities taken" pursuant to this minute are subject "to applicable laws and standards in each country".

None of these minutes authorize the issuance of critical commentary dealing with water quality related to non-toxic dissolved-ion concentrations (salinity) in the Rio Grande in New Mexico, nor in the El Paso-Juarez area.

Rational For EBID Concerns

The Elephant Butte Irrigation District has been threatened with litigation with entities in the State of Texas where water quality (salinity) or, more specifically the dissolved solids content (TDS) of the water in the Rio Grande, may be an issue. The U.S. Section has published technical information, that has not been subject to peer review, that could directly or indirectly result in the redistribution of the water resources of the Rio Grande. The emphasis placed on salinity concerns in the Rio Grande at El Paso in the U.S. Section's publication can give support not only to Texas claims to lower TDS water, but to similar demands by other parties using the river as a supply. The Elephant Butte Irrigation District is concerned about the lack of sensitivity on the part of the U.S. Section to this issue.

Specific EBID Concerns

In July 2003 the Texas Clean Rivers Program and the U.S. Section of the IBWC published a report titled: **2003 Regional Assessment Of Water Quality In The Rio Grande Basin**. The following excerpts from the **Assessment** represent a few of the statements in the report about salinity that are a concern to the Elephant Butte Irrigation District as the District believes that intensive salinity monitoring in the El Paso-Juarez area, and the interpretation of this TDS data in the **Assessment**, are not within the scope of the 1944 Treaty or of the Minutes issued by the IBWC. The page numbers and quotes in the comments that follow refer to the page numbers and statements in the **Assessment**:

- Page xvi in **Executive Summary:** "The Upper Rio Grande Basin sub-basin extends from the Texas/New Mexico line to Amistad Reservoir. Primary concerns in the sub-basin include .....salinity (chloride, sulfate, TDS)...." "High salinity is attributed primarily to current irrigation practices."
- Page 1, **Introduction:** The Rio Grande as it flows into Texas from New Mexico exceeds the criterion established for salinity ..." NOTE: This statement is in conflict with that on page 52 to the effect that at Station 13276 on the Rio Grande near Anthony, Texas that water quality in the river meets the Texas Water Quality Standards. It is also at odds with statements on page 102 and 103 as follows:
    - Page 102, **Segment 2314, Station 13276 at Anthony:** Lists sulfates, chlorides, and TDS and the Texas Water Quality Standards, followed by the words "meets designated uses" for each of these constituents.
    - Page 103, **Segment 2314, Station 113272 at Courchesne Bridge upstream of the International Dam:** Lists sulfates, chlorides, and TDS and the Texas Water Quality Standards, followed by the words "meets designated uses" for each of these constituents; and
- Page 1, **Introduction:** "High salt levels in the Rio Grande limit its use for agriculture and municipal use."
- Page 51, **Rio Grande above International Dam:** "Irrigated agriculture ..... impacts this area."
- Page 62, **Upper Rio Grande Sub-basin Salinity:** "Salinity has been a concern in the upper basin for many years primarily due to the extensive water use for agriculture and as a drinking water supply. Water from the Rio Grande picks up salt from the soil after it has been used for irrigation from one community to another to point where it does not meet the standards for a public waster supply." (Note: El Paso is the only significant surface water supply in the Upper Basin)
- Page 63, **Excerpts from a paper on salt accumulation**: "The salinity of the soil appears to be increasing from upstream site in New Mexico compared to downstream sites in and below the El Paso and Hudspeth counties".
- Page 85, **Conclusions and Recommendations; Upper Rio Grande Sub-basin "**. Water quality concerns in the Rio Grande consists of elevated levels of ..... dissolved salts ...". "High levels of salt of salt are due to return flows that carry dissolved salts from irrigated agriculture and runoff from soil that is high in salinity."

ISSUE II

U.S. Section's Proposals to Establish New Zones Of Riparian Vegetation along the Rio Grande in New Mexico

U.S. Section Activity

The U.S. Section has proposed new additional areas for the establishment of riparian vegetation in and along the Rio Grande in New Mexico under the agency's Reformulation of River Management Alternatives for the Rio Grande Canalization Project. The current documentation and the U.S. Section's proposed alternatives are part of an Environmental Impact Assessment under the NEPA requirements. These proposals are in addition to past Agency permitted channel vegetation programs. In March 1999, the U.S. Section of the IBWC entered into a Memorandum of Understanding (MOU) with the Southwest Environmental Center (SWEC) under which certain physical actions were taken by the U.S. Section, specifically the establishment of "green zones" and test areas along substantial stretches of the Rio Grande. Additionally, the U.S. Section cooperated with SWEC in planting trees in IBWC-controlled areas from 1999 on.

Authority For U.S. Section Actions

The documentation for the Reformulation of River Management Alternatives is noticeably absent in explaining the Agency's mandate and motivation in proceeding in the direction of the 2003 EIS. This does not appear to be an EIS on the full scope of the environmental operations of the U.S. Section. None of the treaty or statutory Agency mandates include environmental enhancement, or riparian restoration. There is little or nothing in the documentation for the Reformulation of River Management Alternatives that discusses the primary functions and duties of the U.S. Section nor is an evaluation of these functions found or proposed in the EIS documentation. The 2003 EIS does not appear to be motivated by concerns under the Endangered Species Act, nor by any action taken or proposed to be taken by the U.S. Fish and Wildlife Service. Similarly, there is little or no discussion in the existing documentation as to the amount of financing and the source of financing for the activities sought to be undertaken for riparian restoration.

Rational For EBID Concerns

In the past the Elephant Butte Irrigation District has registered its concerns about the U.S. Section's efforts to establish new vegetation in the Rio Grande channel

and flood plains. This was done formally in an extensive (six page) letter dated June 17, 2002 to Mr. Douglas Echlin, an environmental protection specialist with the U.S. Section. The comments of the District appear to have been totally disregarded as many of the same issues reappear and are unanswered in the Agency's 2003 Reformulation of River Management Alternatives for the Rio Grande Canalization Project. A major District concern is the illegal taking of Project water resources by the planting of new vegetation by the U.S. Section and its MOU partner. The Agency's actions in permitting the planting of vegetation in the river channel could , directly or indirectly, alter the distribution of water to users in Texas and New Mexico.

Specific EBID Concerns

The basic EBID concerns remain the same as those outlined in our letter of June 17, 2002 to the U.S. Section of the IBWC. Some of these are:

- The absence of good hydrologic studies of the effects of new riparian vegetation on the water supply in the Rio Grande particularly the situation that will prevail during long-term drought situations. The tree planting actions, and the resulting increase in depletions of stream flows as a result of riparian evapotranspiration, have obviously effected the availability of water in the Rio Grande system. A realistic estimate of the annual water use by all trees planted within the IBWC right-of-way must be made and an environmental analysis is needed of the water use by these newly introduced trees.

- The lack of a sound program for the retirement of existing farm lands to provide water that riparian vegetation will consume, particularly off-setting the consumptive effects of new vegetation during prolonged droughts. Any new water-use created by actions of the U.S. Section of the IBWC must be offset, minimally, by the acquisition of water rights in an equal amount by the Agency. Failure to legally acquire off-setting water-rights constitutes a taking property rights (water rights) which belong to others and for which no compensation has yet been paid. An analysis of property takings under applicable executive orders should also be undertaken.

- The U.S. Section's failure to prepare an all inclusive EIS remains a concern. The U.S. Section's MOU with the Southwest Environmental Center should have been the subject of environmental documentation at the time of origin. The fact that it was not does not excuse evading a comprehensive environmental review at this time. All federal agencies subject to NEPA know that just because effects of a federal action may be considered positive to the environment, does not preclude the need for a full environmental review. NEPA requires not only the review of environmental effects, but also consideration social and economic effects

as well. The U.S. Section considers all actions taken under the 1999 MOU as the environmental baseline for consideration of future effects. This is a false presumption and must be corrected. NEPA requires a federal agency to analyze all of its actions, not just those incremental actions recently undertaken. The environmental baseline must be the situation that preceded the 1999 MOU and any 2003 and future NEPA review must include consideration of all of the actions taken by the U.S. Section as past actions will be part of any alternative selected by the Agency in its Record of Decision.

- There is little or no discussion in the existing documentation as to the financing and the sources for funding the activities sought to be undertaken for riparian restoration. The capital costs for the alternatives, except the no action alternative, range from $65 million to $204 million. Discussion of the financial base for various alternatives would seem to be essential, as well as a full discussion of the annual maintenance expenses that Agency anticipates. To be feasible alternatives they must be economically feasible. If the U.S. Section finds these alternatives to be economically feasible, then appropriate source of funds should be identified.

- Some, if not all, of the alternatives to be examined in the Agency's EIS constitute substantial deviations from the primary purpose and duty of the U.S. Section of the IBWC. The EIS should properly analyze and evaluate how substantial these deviations will be from the statutory duties of the agency. The deviations from the duties of the agency should in turn be evaluated for their environmental, economic and social effects upon the people and land in southern New Mexico and western Texas that will be affected. EBID believes that these effects will be substantial, and they cannot be ignored or understated in the EIS.

- The Agency's documents fail to recognize the conservation effort of the District. The Reformulation report states that "The agricultural community along the RGCP, at present, does not have a clear incentive for investing in water conservation." The farmers in EBID have invested large sums of their own resources to install high-flow turnouts and to laser-level virtually all of the large fields in the District. Miles of ditch laterals have been concrete lined. The District has implemented a flow measurement program from the diversion to farm delivery, and return flows to the river. The District has experimented with alternate-row irrigation. The District and its members have, and have always had, the incentive to conserve water, and have always done so. Research by New Mexico State University has shown in at least two studies that District farmers achieve irrigation efficiencies as high as 85 percent using modern surface irrigation, rather than the 40 to 65 percent quoted in the report. This is indicative of the lack of site-specific conditions conveyed in the report.

- The Reformulation report also proposes use of groundwater to establish riparian vegetation. While it is the responsibility of the New Mexico State Engineer to permit groundwater use in New Mexico, it seems highly unlikely that this new depletion would be permitted.
- The only acceptable alternative in the 2003 EIS is maintaining current situation; that is, the "no action alternative". As the NEPA process continues, it is proposed that the U.S. Section of the IBWC arrive at the same conclusion.

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

NOV 1 4 2003

Mr. Gary Arnold
Board President
Elephant Butte Irrigation District
P.O. Drawer 1509
Las Cruces, New Mexico 88004-1509

Dear Mr. Arnold:

This responds to both your September 13, 2003 and November 3, 2003 letters to me. The first letter provides an issue paper on two issues you claim are prejudicial to the best interests of the Elephant Butte Irrigation District and to the State of New Mexico. The second letter included an invitation to the November 19, 2003 meeting of the Board of Directors to discuss the issues.

First, however, I am compelled to respond to your misunderstanding stated in the first letter of the environmental authority of the United States Section, International Boundary and Water Commission (USIBWC). You state that it is your understanding that the USIBWC's "environmental duties stem from the U.S.-Mexico Treaty of 1944 and subsequent agreements between the two countries as recorded in IBWC minutes."

For your information, the USIBWC is a United States governmental agency in every way similar to the United States Army Corps of Engineers, United States Bureau of Reclamation and United States Fish and Wildlife Service; agencies with which I know you are very familiar. The international body, or International Boundary and Water Commission, United States and Mexico (IBWC), is designated by Executive Order (E.O.) 12467 issued March 2, 1984 as a public international organization entitled to enjoy the privileges, exemptions, and immunities conferred by the International Organizations Immunities Act (59 Stat. 669, 22 U.S.C. 288). Section 2 of the E.O. does not extend these rights and privileges to the USIBWC. That is to say, the USIBWC, established to carry out the work in the United States of the agreed upon actions of the IBWC, like any other federal agency, is required to follow the laws of the United States, including the National Environmental Policy Act (NEPA) of 1969. It is NEPA and subsequent Council on Environmental Quality regulations that dictate the authority of USIBWC's environmental compliance.

That established, allow me now to respond specifically to the two issues you raised.

Issue I: USIBWC's Representation for the State of Texas

The USIBWC has the authority to enter into an agreement with Texas Commission on Environmental Quality (TCEQ) in furtherance of the TCEQ Clean Rivers Program (CRP), and did so pursuant to 22 United States Code Section 277h (Authority of the International Boundary and Water Commission to assist State and local governments). This law states in part:

> "The Commissioner of the United States Section of the International Boundary and Water Commission may provide technical tests, evaluations, information, surveys, or other similar services to State or local governments upon the request of such State or local government on a reimbursable basis."

The agreement between TCEQ and USIBWC requires the USIBWC to conduct data collection for basin-wide monitoring, special studies project planning, and quality assurance project planning for the Texas portion of the Rio Grande. The Rio Grande originates in the headwaters of the San Juan Mountains of southern Colorado, and flows southward for approximately 600 miles through New Mexico and into Texas. Along the Texas portion, the Rio Grande forms a 1260-mile international boundary between the United States and Mexico. The TCEQ initiated the agreement with the USIBWC for the reasons that data collection for the CRP could more efficiently be achieved by using manpower stationed at USIBWC headquarters and field offices and because data collection would be facilitated in the international river where jurisdiction is divided between the United States and Mexico. Administration of the CRP program in the Rio Grande Basin ideally requires a coordinated effort between two states and two countries.

The work product and report, "2003 Regional Assessment of Water Quality in the Rio Grande Basin," was funded and is wholly owned by TCEQ. As a general condition of the TCEQ state-funded grant agreement, the USIBWC has granted an intellectual property license to TCEQ covering all work produced in the course of fulfilling the scope of work of the agreement.

Specific Concerns in Issue I:

Page xvi in Executive Summary: "The Upper Rio Grande Basin sub-basin extends from the Texas/New Mexico line to Amistad Reservoir. Primary concerns in the sub-basin include ... salinity (chloride, sulfate, TDS) .... High salinity is attributed primarily to current irrigation practices."

Response 1: The three concerns addressed in the assessment: salinity, bacteria and nutrients represent the analysis of data that has been collected over the past five years. The data indicates that below El Paso, return flows from Mexico and the United States contain high levels of chloride and sulfate (which influence the TDS value), resulting in an increase that causes exceedances when compared to the Texas Surface Water Quality Standards (TSWQS) under the General Use Criteria and the Public Water Supply use. The exceedances continue from below El Paso until tributary flows below Big Bend National Park dilute the concentration of TDS, chloride and sulfate to meet the TSWQS. The return flows consists of Publicly Owned Treatment Works (POTWs) effluents, irrigated agriculture and industrial return discharges that re-enter the Rio Grande at various points in this part of the Rio Grande.

Page 1, Introduction: The Rio Grande as it flows into Texas from New Mexico exceeds the criterion established for salinity ...."

Response 2: The salinity levels are exceeded as the Rio Grande flows into Texas from New Mexico at certain times of the year (November-February) for a public water supply. During this time, water would require additional treatment or blending in order to be used for drinking water purposes. This segment is also impaired due to high bacteria levels that exceed TSWQS. The primary flows in the Rio Grande during the November-February time period, in this reach, are mostly from POTWs (from Texas and New Mexico) and from agricultural returns at the confluence of the Montoya drain and the Rio Grande.

Page 1, Introduction: "High salt levels in the Rio Grande limit its use for agriculture and municipal use."

Response 3: Data from the CRP monitoring stations indicate (from upstream to downstream) that as drains from irrigation runoff, industry and POTWs located in Texas and Chihuahua, flow back into the Rio Grande, the concentration of chloride, sulfate, and TDS increase to the point where the TSWQS for general criteria and the Public Water Supply uses are exceeded. The water in the river could not be used as a public water supply without advanced water treatment technologies, i.e. reverse osmosis below El Paso to downstream of Big Bend National Park. All segments below El Paso are designated as a public water supply source in order to protect water users not only in the Upper Rio Grande Basin, but communities below Amistad Reservoir who utilize the Rio Grande as their only source of drinking water. Previous reports on soil salinity, soil type, and water quality indicate that as chloride, sulfate, and sodium increase, it will affect crop selection and crop yield. Please refer to Response 6.

Page 51, Rio Grande above International Dam: "Irrigated agriculture ... impacts this area."

Response 4: The data from stations in Segment 2314 shows an increase in chloride, sulfate, EC and TDS during the winter months, November-February primarily. Although the annual average meets the TSWQS, there is still a concern that above average chloride, sulfate, EC and TDS concentrations occur during the winter months and impacts this part of the Rio Grande. The public water supply use regarding salinity (TDS, chloride, sulfate) would exceed the criteria for this designated use in Segment 2314 during this time period. Bacterial levels above the TSWQS have also been identified in this reach not only in the mainstem of the Rio Grande, but in the Montoya drain as well. The source of the impairment for bacteria appears to be downstream of Station 13276 and upstream of Station 13272. Segment 2314 exceeds the criterion for fecal coliform and *E. coli* and has been listed on the state of Texas 303(d) list as an impaired segment. During this time period, November-February, the majority of the flow is comprised of return flows from POTWs, runoff and baseflow from irrigation drains.

Page 62, Upper Rio Grande Sub-basin Salinity: "Salinity has been a concern in the upper basin for many years primarily due to the extensive water use for agriculture and as a drinking water supply. Water from the Rio Grande picks up salt from the soil after it has been used for irrigation from one community to another to point [sic] where it does not meet the standards for a public waster [sic] supply."

Response 5: The primary concerns, expressed during public forums and among water work groups, have identified salinity and public water supply as two of the top concerns regarding water quality in the Upper Rio Grande Basin. Refer to Response #3.

Page 63, Excerpts from a paper on salt accumulation: "The salinity of the soil appears to be increasing from upstream sites in New Mexico compared to downstream sites in and below the El Paso and Hudspeth counties."

Response 6: The objective of this research is to determine the salt accumulation and release processes and their impact to the increased salinity levels at Amistad Reservoir. This report along with previous studies indicate that additional information is needed to better understand salt storage and its contribution to in-stream salinity fluctuation. The reason for the increase in salinity is not known. Analysis of the data shows that soil salinity in the riparian section increases from upstream to downstream, from New Mexico into Texas, based on the sampling sites. The highest soil salinity values occur in El Paso and Hudspeth counties. Please refer to an additional report entitled, "*Salinity Problems of the Middle Rio Grande Basin: An Overview*," S. Miyamoto.

Report summary: Salinity of project water from Elephant Butte, the main reservoir for the middle Rio Grande Project, has ranged typically from 400 to 500 mg/L. However, quality of the river water deteriorates downstream; 700 to 1000 mg/L at El Paso and 1100 to 2000 mg/L when entering Hudspeth District. . Sodicity expressed in SAR is also low at the reservoir, averaging 2.5, but increases to 3 to 6 at El Paso, and 6 to 18 when entering the Hudspeth District. The use of this water source has caused soil salinization and sodification, mainly in the Hudspeth District, and in some clayey soils of the El Paso Valley. Soil salinization led to cropping constraints in the Hudspeth District, and significant yield reductions of high value crops such as pecans and vegetable crops in the El Paso Valley. In urban sectors, relatively high salinity of potable water caused salinization of recreational turf established on clayey alluvial soils, and to a lesser extent, in upland soils consisting of poorly permeable caliche. Salinity and sulfate concentrations of the river water reaching El Paso during non-irrigation seasons exceed the Texas Standard for Drinking Water Supply, thus limiting the full-utilization of this surface water resource. Reuse of reclaimed municipal effluent began for maintaining large landscape areas, but indiscriminate use of sprinkler irrigation is inducing considerable foliar salt damage. Salinity problems could increase with increasing utilization of all types of water resources for crop irrigation and for municipal purposes, unless appropriate salt management is incorporated. The progressive salinization of the river flow is caused largely by the inflow of saline drainage water back into the river stream. Therefore, any measures which will reduce diversion and/or return flow have potentially a positive impact on downstream salinity. There are indications that river banks are undergoing salinization, and riparian vegetation except for the reach with mowing activities has shifted largely to salt cedars. The salts stored in the bank and flood plains are subject to flushing during spills or high flow. Salt flushing from the middle Rio Grande into Amistad International Reservoir occurred during 1986/87, and it could be occurring above Elephant Butte as well. Vegetation management in riparian zones and flood plains may become an increasingly important salinity control strategy in this basin.

Page 85, Conclusions and Recommendations; Upper Rio Grande Sub-basin: "Water quality concerns in the Rio Grande consists of elevated levels of ... dissolved salts ...." "High levels of salt of salt [sic] are due to return flows that carry dissolved salts from irrigated agriculture and runoff from soil that is high in salinity."

Response 7: This is similar to Response #1. Data from the CRP monitoring stations in the Upper Rio Grande Sub-basin indicate that the primary source of increased levels of chloride, sulfate, and TDS are from agricultural return flows. Dilution of these flows below Big Bend National Park from springs and tributaries help to reduce the salinity prior to reaching Amistad Reservoir.

Issue II: USIBWC's Proposals to Establish New Zones of Riparian Vegetation Along the Rio Grande in New Mexico

The USIBWC responded to a June 28, 2002 (not June 17, 2002 as stated by EBID) letter from EBID on September 4, 2002. The USIBWC's response included an attachment of Parsons letter dated August 7, 2002. The Parsons letter provided detailed responses to the same concerns raised in Issue II of the current letter. Notwithstanding, a reiteration of the responses provided by Parsons follows.

Regarding the USIBWC activity of riparian vegetation establishment and extent of "green zones," the general issues are the concern that the three "green zones" and limited tree planting since 1999 represent significant water consumption. In reality the no-mow zones represent limited provisional test plots intended to evaluate effects of additional vegetation growth on the Rio Grande Canalization Project (RGCP) functions. Under current conditions those zones have a very limited potential for water consumption because they are not irrigated and, given the extended drought, only scattered vegetation growth has occurred to date in the no-mow zones.

The acreage of the no-mow zones is as follows: the first zone extends 5 miles from Percha Dam to the Doña Ana County line, and ranges in width from 10 to 35 feet. At an average 20-foot width, it covers approximately 24 acres. The second zone corresponds to Seldon Canyon where USIBWC historically has not conducted mowing operations since the agency's jurisdiction is limited to the channel bed and stream banks. The third zone, extending for 5 miles from Shalem Bridge to Picacho Bridge, vegetation is allowed to grow for a width of 35 feet. Regular mowing is maintained in areas adjacent to bridges (400 feet upstream and downstream from the structure) and access points to the river (100-ft long segments located at 800-ft intervals). The extent of this no-mow zone is approximately 19 acres. In combination, no-mow zones outside Seldon Canyon cover less than 1 percent of the 8,332 acres of project right of way.

Tree planting since 1999 has been limited to approximately 800 cottonwood poles planted individually at 100-foot intervals, and only a fraction remains alive since they are not irrigated. In combination, and if and when they reach maturity, all plantings would cover less than 5 acres at their typical density under natural conditions.

Another issue is the need for an environmental evaluation for the no-mow zones. Given their small magnitude, it becomes obvious why actions such as temporary test plots fall under a categorical exclusion.

Another issue related to "green zones" is whether they should be part of the baseline condition (which in NEPA is defined as the current condition). While that scattered vegetation growth currently present in the no-mow zones could be considered an individual action, albeit a very small one, in the EIS analysis those zones are being evaluated as part of the more comprehensive and substantial action of future areas in the floodway with full vegetation growth. This larger action is part of the alternatives under evaluation, and was presented in tabular form in the handout provided to EBID during the April 17, 2002 meeting.

Regarding the USIBWC authority for the environmental analysis see my lead paragraph to this letter regarding the USIBWC environmental analysis authority.

Regarding the statement that the reformulation of alternatives report does not appear to be an EIS is correct. This document is a step in the process of developing alternatives for analysis in the EIS. In addition, in Section 1 of the draft EIS the purpose and need for the project is discussed. Further discussion on this issue follows later.

Regarding EBID's rational for concerns on water rights and the statement that USIBWC totally disregarded responding to the issue, in fact, the Parsons August 7, 2002 letter answered this concern. Regarding whether there are actual water savings by salt cedar removal, Parsons responded that while very high water consumption by this introduced species is a fact fully supported by extensive scientific data, there is agreement that it would be very difficult to reach a consensus as to the actual potential for reduction in water consumption.

The district also questioned whether any saved water could be used in other environmental improvement actions, such as opening of meanders, since all surface water is allocated to the Rio Grande Project. In response to EBID's concerns, Parsons modified the formulation of the proposed action. Initially they presented the action simply as removal of salt cedar to offset water losses by other environmental actions. In the reformulation of alternatives, salt cedar control partially offsets water consumption by the new riparian vegetation on a site by site basis. For other environmental actions that need additional water, acquisition would be required.

Finally, the need for evaluation of socioeconomic impacts was stated. We fully understand this point and for that reason socioeconomic and water use issues are major components of the draft EIS. In fact, Parsons presentation identified water conservation programs and not decommissioning agricultural lands as two key elements in the implementation strategy.

Specific Concerns in Issue II:

Bullet #1 - The specific estimates of water use by new riparian vegetation is addressed in the draft EIS.

Bullet #2 - Here EBID requests a program for existing farmland retirements and water rights acquisition. This ignores that not retiring farmlands is a goal of the alternatives, and need for water acquisition is clearly indicated in multiple sections of the reformulation of alternatives report (including those sections from which EBID is taking rephrased quotes).

Bullet #3 - EBID continues to label the reformulation of alternatives report as an EIS despite an explicit indication in the document's introduction and a statement in the USIBWC September 4, 2002 letter with attached Parsons August 7, 2002 letter to the contrary. To reiterate, the reformulation of alternatives report is not an EIS. The report provides the background and reasons for changing the alternatives from those developed in the March 2001 alternative formulation report to be analyzed in the EIS. It is the purpose of the EIS to discuss the potential impacts of future operation of the RGCP, not the reformulation of alternatives report. The draft EIS will be available for public review soon. This point was stated in previous meetings with and correspondence to EBID. This misunderstanding explains why EBID lists a number of impacts they believe have not been adequately addressed. Several of those impacts are relevant and will be included in the EIS analysis. Once the Draft EIS becomes available, all stakeholders will have the opportunity to comment as to whether potential impacts were adequately evaluated.

Bullet #4 - Costs of the alternatives can be included as information in the EIS (although it is not in the preliminary draft now under review by USBR and USIBWC staff). Cost can be a factor as with the environmental analysis and other considerations for the USIBWC to make the final decision on selection and implementation of the alternatives.

Bullet #5 - See response to USIBWC authority for environmental analysis and purpose and need statement above.

Bullet #6 - Regarding recognition of water conservation, a paragraph on EBID's conservation practices is presented in the reformulation of alternatives report that specifically addresses on-farm conservation. The lack of incentives to individual farmers for on-farm conservation was quoted from an EBID document and is now quoted verbatim in the preliminary draft EIS, along with the New Mexico Office of the State Engineer irrigation efficiency numbers in the preliminary draft EIS, as follows:

> "Support of water conservation by financing on-farm water conservation programs was identified as a viable strategy to secure water for use in environmental measures. A review study on irrigation efficiency published in the Fall 2001 issue of NMOSE's Waterline indicated that a flood irrigation efficiency typically ranges from 40% to 60%, 65% for high-pressure center-pivot sprinklers, 60% to 65% for side-roll sprinklers, and 85% to 90% for

drip irrigation. EBID's on-farm irrigation efficiency was quoted at 60% (Wilson 2001). Potential on-farm irrigation efficiency increases up to 80% for high-pressure center-pivot sprinklers were listed for the use of partial-length drop-down tubes and 95% for full-length drop-down tubes (Wilson 2001).

"Supporting water conservation programs would not only be consistent with stated interests of the irrigation districts (EBID 1998; EPCWID#1 2000), but would also facilitate seeking funds from high-priority state and federal programs. Such conservation programs would focus on financing on-farm irrigation system improvements that represent a substantial investment for individual farmers. Along the RGCP, individual farmers at present do not have a clear economic incentive for investing in more water-efficient but expensive on-farm irrigation systems. Economic incentives to compensate for water rights attached to any saved water are likely needed to foster such on-farm water conservation programs. As stated by EBID (1998) General Data and Information booklet: *'In the future some form of economic incentives for both (1) helping reduce the capital outlay for the conversion to a more water conservative irrigation system than is presently in use and (2) by far perhaps the more important from the farmer's standpoint, an economic incentive to compensate for the water right attached to any 'saved' water, will most probably need to be implemented in order to foster a purpose of conservation with broader range and benefits to a greater number of users than is already in place within the agricultural community.'*

"Water banking is a water management strategy that speeds up the temporary transfer of water from those willing to lease it to those willing to pay to use it. Farmers and other water rights holders can deposit some or all of their allotted water into a 'water bank' where users pay the going market rate to borrow it for a limited period of time. The lessor retains ownership of the water rights, and rights placed in the bank cannot be forfeited for non-use (Salem 2002).

"The water banking concept is gaining support in the State of New Mexico. In November 2002, the State Engineer's Office issued draft regulations for water banking in the Lower Pecos River Basin (NMOSE 2002). While this is a very restricted program for a specific basin, in the future it could lead to a broader application of such programs in the state.

"Both strategies, supporting water conservation programs and water banking, would allow gradual implementation of measures under consideration over a 20-year horizon. The implementation timetable, described in Subsection 2.10, considers an initial development period during which financial/cooperative agreements can be reached, and pilot-scale projects tested in terms of viability, environmental benefit, and potential water use prior to the implementation of projects on a larger scale."

Bullet #7 - We agree, groundwater use is an option that is characterized as highly unlikely.

Bullet #8 - We recognize EBID's selection of the No Action Alternative as the only acceptable alternative. However, we would prefer that they review the draft EIS in its entirety before making their selection since such a conclusion can only be reached once the evaluation of impacts is completed.

The USIBWC and the CRP hold annual public meetings along the border to present information derived from the ongoing routine water quality monitoring program and special studies that are conducted in the Rio Grande Basin. Over the past four years, the CRP has invited staff from the EBID office to all of it's public meetings and coordinated monitoring events and has solicited their input into the program. Input from the public is welcomed and encouraged in order to help steer the program and address issues that are of concern to the community. Ongoing efforts include participation in the United States Environmental Protection Agency (EPA) Border 2012 initiative as part of the water workgroup. Under the Border 2012, the USIBWC and the CRP will focus on improving water quality monitoring by attempting to include additional monitoring in a binational setting to include agencies and groups from Mexico actively participating in the program. The CRP staff has also provided water quality data to the New Mexico Environment Department for use in assessment of the Rio Grande Basin in New Mexico to fulfill its state and federal mandates. The USIBWC and the CRP will continue to provide water quality data, technical support, and strive to collaborate with New Mexico entities to achieve the goals of both states in addressing water quality issues in our region.

I hope this adequately responds to your concerns. We look forward to your comments on the draft environmental impact statement when it is released to the public. Regarding your invitation to speak at the Board meeting on November 19, 2003, I have prior commitments; therefore, I will not be able to attend your meeting. However, the USIBWC welcomes the opportunity to meet you to discuss any further concerns you might have. You may contact me at (915) 832-4147.

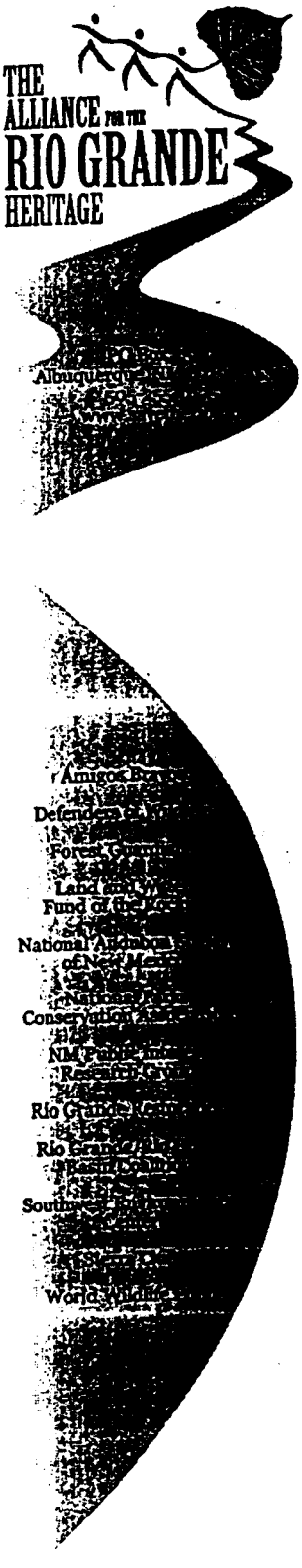
Sincerely,

Debra J. Little
Acting Commissioner

cc:

Senator Pete V. Demenici
New Mexico
United States Senate
Washington, DC 20510-3101
Attn: Mr. Kristopher T. Schafer

R.C. Wooten, Principal, Parsons, Austin



Acting Commissioner Debra Little
International Boundary and Water Commission, U.S. Section
4171 N. Mesa, Suite C-310
El Paso, TX 79902-1441

RE: Reformulation of River Management Alternatives and Draft Canalization EIS

10-005

Dear Commissioner Little:

IBWC has taken great strides this past decade to begin to address the environmental impact of its boundary and water services along the United States and Mexico border region. We applaud these efforts because our border rivers provide tremendous benefits and habitat for wildlife and support large-scale ecological processes as migratory pathways and wintering grounds for waterfowl and shorebirds. Proper ecological management of these rivers can also, of course, be of great benefit for the quality of life in communities along the watershed.

IBWC took a significant step in fulfilling its role as an environmental steward when it undertook evaluation of long-term river management alternatives for the Rio Grande Canalization Project. Although the Canalization EIS addresses only a limited reach of the Rio Grande, it has far reaching implications for environmental sensitivity by your agency along the length of the Rio Grande and the Colorado River. This is one reason, among others, that the Canalization EIS is of such concern for many national and regional environmental groups. Another reason is this reach of the Rio Grande has experienced some of the greatest impacts on its geomorphology, hydrology and biology of the entire 873-mile Upper Rio Grande basin. Further, this reach may prove instrumental to enhancing flows to the Forgotten Reach and reversing the hydrologic disjunction between the upper and lower Rio Grande basins.

The Alliance greatly appreciates IBWC's efforts to date to make the Canalization EIS a transparent and inclusive process. As recently as August 22nd, members of the Alliance, along with Phil King, representing the Elephant Butte Irrigation District, met with your staff to discuss major concerns shared by both the environmental and agricultural community with flood modeling analyses that are integral to the EIS.

While we are encouraged by IBWC's efforts to meet with us, it is becoming increasingly clear that the proposed alternatives are not being modified to address our primary concerns. We wanted to make certain that you were aware that this was happening. These concerns

are both technical and legal in nature. The technical issues are detailed in the attachment to this letter. Most of these have been raised with Parsons and your staff previously. The legal issues were raised in our September 25, 2002 letter to Commissioner Ramirez.

We feel strongly that it is not in the best interests of the environmental community or IBWC to resolve these issues through litigation. Moreover, we feel that through further refinement of sources of environmental water and flood modeling, it is conceivable that an alternative could be developed that garners both agricultural and environmental support and reduces IBWC maintenance costs. But, such an alternative will take time and further negotiations. We recognize that IBWC is operating under severe fiscal and staffing constraints, and are concerned that these constraints will militate against further exploration of alternatives and result in a November release of the Draft EIS. We would urge IBWC to not let such short-term considerations outweigh the overwhelming benefits of a collaborative resolution of these issues.

We have requested a meeting with you on October 24 at 10 a.m. to discuss the Canalization EIS further. We remain hopeful that a solution can be found that meets the needs of all stakeholders, even if it delays issuance of the draft EIS further. We renew our offer to help make this outcome a reality.

Sincerely,

Kevin Bixby, Executive Director
Southwest Environmental Center
(for the Alliance)

Enclosure

The following is a summary listing of the Alliance's major technical concerns related to the alternatives formulation for the Canalization Project.

1. Definition of Restoration

The definition of restoration used in the EIS is critical as a starting point for complying with the Memorandum of Understanding (MOU) signed with the Southwest Environmental Center, which requires the EIS to include an analysis of:

> "flood protection measures and alternatives to current management, including watershed-oriented and non-structural alternatives, and including collaborative measures with other agencies and landowners, to determine to what extent project management can support restoration of native riparian and aquatic habitats, as well as the restoration of natural fluvial processes such as channel meanders and overbank flooding."

The Alliance is guided by the definition of river restoration put forward by the National Academy of Sciences (*Restoration of Aquatic Ecosystems: Science Technology, and Public Policy*, 1992) and the U.S. Environmental Protection Agency. This definition embodies the following concepts:

- Looks to the predisturbance state for reference (pre-1870 in this case, but certainly pre-Elephant Butte Dam)
- Seeks to address causes not just symptoms of disturbance
- Seeks to replace hydrologic conditions as well as structure
- Is holistic and multi-faceted
- Is sustainable because it requires a minimum of human intervention
- Considers specific biotic elements.

We do not believe the definition of restoration used by Parsons is scientifically defensible or adequate to meet the requirements of the MOU or the National Environmental Policy Act (NEPA). The concept of "partial restoration" relied upon by Parsons is unnecessarily and arbitrarily limited. Because it lacks the above elements, it has resulted in the inclusion of "restoration" measures within the alternatives that are neither holistic nor sustainable. Parsons has not given adequate consideration to the following key river restoration objectives:

- provide a greater range of flow regimes
- enhance river dynamic behavior
- remove constraints on natural channel processes
- expand the active floodplain
- increase the channel/floodplain hydrologic connectivity
- enhance sediment loading to support channel functions
- ensure channel forming flows will sustain restoration measures.

Lest our idea of restoration seem unrealistic, we encourage IBWC to consider the restoration effort currently underway on the middle Rio Grande by the Save Our Bosque Task Force (SOBTF), a group comprised of federal agency personnel and other stakeholders. SOBTF's vision of restoration is:

> *A riparian ecosystem that functions as natural as possible within the confines of 21st Century infrastructure and political limitations while respecting the traditional customs and cultures of the citizens of Socorro County.*

Two objectives have been defined to achieve this goal: 1) enhance natural river functions; and 2) increase habitat diversity. The general approach used by SOBTF is to create riparian restoration opportunities by establishing favorable hydrogeomorphic conditions, i.e. to let the river do as much of the work of restoration as possible, to save money and to ensure sustainability. We endorse this approach.

2. Adequacy of modeling

A continuing concern is the exclusive reliance by Parsons on a one-dimensional hydraulic model, which in our opinion does not allow for the kind of analysis needed to comply with NEPA and the MOU. Specifically, this kind of modeling does not provide accurate or credible answers to the following key questions that are central to all the alternatives:

- the fate of the design flood event as it travels downstream, and hence,
- the quantitative need for flood protection at each point within the project
- the extent to which vegetation can be allowed to occupy the floodway
- the extent to which flood protection requirements could potentially be met by non-structural means
- the amount of floodplain that could be wetted by design restoration flows of various sizes
- the amount of water consumed by restoration features, such as riparian vegetation or sloughs

Accurately predicting channel and floodplain interaction with flow attenuation and infiltration/evaporative losses cannot be accomplished with a single discharge, one-dimensional HEC-2 or HEC-RAS model.

In its evaluation of levee freeboard deficiencies, Parsons relies on the 100-year flood event estimated by a HEC-1 Corps watershed model. Floodwave attenuation in the arroyos and the Rio Grande channel due to overbank storage flows is probably underpredicted resulting in relatively narrow high peaks at various locations in the RGCP. The conservative estimates of the flood peaks in the RGCP may result in a recommendation that the RGCP levee system was deficient in some areas when in reality the levee was not impacted by flooding. A conservative estimate of the design flood peak discharges will result in higher costs associated levee flood protection improvements.

We have suggested on numerous occasions that two-dimensional flood routing modeling is needed to provide the kind of analysis called for by the EIS. It would certainly seem to be in the interest of IBWC to do this kind of modeling since it could help the agency avoid wasting potentially a great deal of money on restoration and/or flood control measures that may not be needed or sustainable. We have offered to help secure the resources needed to undertake such modeling. To date, our suggestions and offer have gone unheeded.

3. Selection and analysis of channel-forming flows

Parsons has failed to consider the central role of channel forming flows in creating and sustaining restoration efforts, and in maintaining flood conveyance capacity. Channel forming flow may be defined as the flow at which the bed material is mobilized and the banks begin to erode.

The outlet at Caballo Dam currently limits the maximum discharge to 5000 cfs. Unless the system is completely full or the outlet works are restructured, 5,000 cfs will be the peak discharge that limits the channel morphology. The potential to retrofit the outlet works has not been addressed by Parsons.

In lieu of increasing the outlet works peak discharge, the channel restoration components and proposed channel morphology should be designed to accommodate the 5,000 cfs release. Releasing 5,000 cfs with the frequency, duration and timing to sustain the restored channel morphology will maximize opportunities to enhance aquatic and riparian habitat and sustain dynamic river functions.

It will also provide the greatest channel conveyance capacity to limit flooding during project design flood events (~100 year flood). If a seasonal peak discharge less than 5,000 cfs is provided on frequent basis, the river will gradually adjust to the lower flow regime with channel narrowing, vegetation encroachment and sediment deposition.

4. Frequency and timing of restoration flows.

Parsons does not give adequate consideration to the timing, frequency and duration of restoration flows. The restoration flow should occur with a prescribed frequency to sustain channel function and eliminate vegetation growth within the active channel.

A channel forming flow frequency on the order of four out of ten years with no more that two consecutive years without the channel forming flow is necessary to sustain the active channel geometry over the long term. This frequency of channel forming flows is also conducive to native vegetation regeneration for mixed stands of vegetations and will reduce the need for mowing in the floodway (one of the objectives for restoration of natural river functions). In the absence of channel-forming flows on a frequent basis, IBWC will be required to continue mechanical techniques (mowing) and dredging to maintain channel flood conveyance capacity.

The timing of restoration flows is critical. The abundance and diversity of native species in the Rio Grande riparian ecosystem is strongly linked to the river's natural hydrograph (Crawford, et al., 1993). Both the rising and recessional limbs are documented to affect the reproductive strategies of many aquatic and riparian species. The decline of the river functions and biological diversity of the system can be primarily attributed to the reduction in peak flow magnitude, frequency and duration.

Releases of restoration flows should be orchestrated to mimic the shape and timing of historic hydrographs. The spring peak flushing flow should be timed to occur the last two weeks of May and it should reflect the shape of the typical pre-1900 hydrograph in terms of the rate of change in the rising and recessional limbs. This peak discharge timing will encourage regeneration of native riparian vegetation.

Parsons has not done the necessary analysis to design a restoration target flow. The product of this analysis would be a series of flow hydrograph scenarios for a restoration channel design that would relate peak discharge, duration, frequency to flow volume and area of inundation. Selection of an appropriate restoration discharge hydrograph and timing would then be based a knowledge of required water volume, costs and constraints.

The Parsons report has presented a number of disconnected hydrologic concepts that were formulated with the single discharge, one-dimensional HEC-RAS model. The targeted restoration flow is poorly defined. The analysis does not provide the opportunity to review various flow scenarios or apply any selection criteria to varying levels of restoration alternatives. There was no iterative analysis of restoration options provided by the report. The reader cannot determine that 3,600 cfs for five days every five years is better than 2,250 cfs for 14 days every other year on the basis of the area of inundation, required volume of water, or cost associated channel restoration.

Both channel and floodplain restoration activities require flows that will equal or exceed the bankfull discharge. Long term sustainability is contingent on designing restoration activities to the channel forming flow.

Parsons recognizes the importance of using seasonal peak flows to promote regeneration of riparian vegetation. However, in the supporting documentation, there is no mention of how these flows relate to existing bankfull conditions or channel forming discharge. There is no discussion of the hydrograph associated with restoration target flows or the required frequency, duration or timing of these flows for sustaining the channel restoration activities. Without knowing the prescribed frequency of the restoration flows, it is impossible to assess whether the restoration components can be sustained over the long term without mechanical intervention.

5. Analysis of sediment loading and transport

One of the keys to designing self-sustaining restoration activities in the RGCP is an accurate estimate of long term sediment loading. The success or failure of restoration activities will depend on channel response to variable sediment yields. Sediment supply

and sediment transport capacity will dictate whether the restored channel geometry will be self-sustaining with managed flows or will require continual mechanical maintenance.

There are several key linkages between the hydrology, sediment load and channel morphology analyses in the Parsons report that are missing. Parsons reports on the sediment load estimates from the arroyos based on the 1996 Corps of Engineers report. The Corps report also indicated the potential sediment deposition or scour associated with the 100-year flood and a 10-year period of high flows. Critically missing from the Parsons' report is an analysis of the whether the existing sediment load will sustain a restored channel morphology, a determination of the impacts of continued load term sediment dredging at the arroyos on channel restoration and an analysis of the relationship between future sediment loading and the proposed restoration plan.

Several important questions related to channel morphology and restoration have yet to be addressed:

- What has been the historical change in bed material size?
- Will the restoration components be sustained over the long term without sediment dredging?
- Can future arroyo sediment loading enhance channel dynamics and stimulate channel migration?
- Would sediment loading sustain a higher width to depth ratio for the channel geometry?
- What is the relationship between the potential sediment loading and RGCP channel conveyance capacity and tributary hydrology?
- If tributary experiences a 100-year flood event, will the proposed channel restoration be positively or adversely impacted?

The relationships between the tributary hydrology, sediment loading, tributary bed material size and channel bed material size and restoration channel morphology must be understood to select a restoration flow.

The Parsons report does not quantify the progressive decline in sediment supply to RGCP. The current channel response to variations in sediment supply has been limited by bank stabilization methods. Bank erosion and channel migration are two components of an active wide channel that have been thwarted by the RGCP and tributary sediment retention facilities.

6. Channel restoration

One of the primary concerns is the failure of the Parsons' Reformation Report to identify reworking the channel geometry as a restoration technique to improve aquatic habitat diversity. The Report acknowledges that instream habitat diversity is low. (4-26) . There are many methods available to rework channel morphology and create low velocity habitat. Failure to consider this environmental measure unduly limits in scope the management alternatives for the Canalization EIS.

7. Sources of environmental water

The Report erroneously implies that restoration measures that consume water will have little or no political viability (4-4, 4-22, 4-26). Our experience suggests that if the dominant source of environmental water is voluntary water transfers, either through the marketplace or by donation, the agricultural community will be supportive of restoration measures. If the irrigation districts play an administrative role in overseeing these transfers, through, for example, an environmental water user's bank, the districts can ensure their farm constituents are not injured by environmental water transfers. For further discussion of this approach, we refer you to Phil King and Julie Maitland's report, "Water for River Restoration: Potential for Collaboration between Agriculture and Environmental Water Users in the Rio Grande Project, available on the web at http://cagesun.nmsu.edu/~jpking/wwf/reportdownload.htm. There may be other viable sources that could be agreed upon with further negotiations between agricultural water users and the environmental community. To avoid further unnecessary conflict on this point, we strongly recommend that the EIS sections on the source of environmental water be drafted collectively by the environmental and agricultural community for review by Parsons and IBWC for incorporation into the Draft EIS.

8. Dramatic reduction or exclusion of restoration measures

We are concerned that environmental measures were dramatically minimized or excluded in the Reformulation report and those that remained were lumped into the Targeted River Restoration alternative despite the fact that the report states 89% of the project is considered below average to poor quality habitat. (Table 4-5). We are concerned that environmental measures were selected to minimize consumptive use of water and not on the basis of habitat value.

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

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Mr. Kevin Bixby
Executive Director
Southwest Environmental Center
275 North Downtown Mall
Las Cruces, New Mexico 88001

Dear Mr. Bixby:

This responds to your undated letter to me, on behalf of The Alliance for the Rio Grande, regarding the Reformulation Report of River Management Alternatives and Draft Canalization Project EIS. You stated your disappointment that, "the proposed alternatives are not being modified to address [Southwest Environmental Center's (SWEC)] primary concerns." There are many stakeholders the EIS must respond to, including your organization, United States Bureau of Reclamation, Elephant Butte Irrigation District, El Paso County Water Improvement District No. 1, etc. The National Environmental Policy Act (NEPA) of 1969 encourages public participation in the process of analyzing proposed project impacts on the human environment. The issues you summarized: definition of restoration, adequacy of modeling, selection and analysis of channel-forming flows, frequency and timing of restoration flows, analysis of sediment loading and transport, channel restoration, sources of environmental water, and dramatic reduction or exclusion of restoration measures have been addressed largely in prior correspondence and meetings, including the most recent meeting on October 24, 2003. Notwithstanding, my reiteration follows.

Regarding the stream restoration definition for the Canalization Project, the United States Section, International Boundary and Water Commission (USIBWC) and consultants met and corresponded numerous times with stakeholders between October 1999 and December 2002, during an extended (over 3-year) scoping process, to receive input for alternatives development. Meetings included open forums, public meetings, presentations, and technical workshops with federal, state, and local agencies, organizations, individuals (farmers), and outside SWEC consultants as well as peer reviewers regarding Parsons alternatives formulation methodologies. As a result of this extended scoping process, the EIS, in accordance with the March 1999 Memorandum of Understanding, will analyze alternatives that are viable and implementable and will respond to the stated concerns of the various stakeholders, including the Alliance and SWEC.

Regarding a pre-disturbance state for restoration, are you suggesting that USIBWC is now supposed to remove the dams and reservoirs as an alternative of our project? The challenge is not restoring a river to historic conditions, but improving the environmental conditions of a river that for all practical purposes now functions as a water conveyance and delivery system. The USIBWC is not responsible for what occurred in the project reach prior to the Canalization Project. The pre-project condition is not our baseline condition, nor should it be. Over the past century, flow regime control and physical modifications to the streambed have drastically changed the configuration of the Rio

Grande along the project reach. Nearly all major changes pre-date the Canalization Project by decades. Understanding the extent of upstream flow control, historical changes in stream configuration, and sediment transport give a realistic view of the ecosystem restoration potential along the project reach.

You state that modeling is inadequate. In fact, as Parsons responded on July 3, 2002 to a similar criticism in your May 31, 2002 letter, current estimates of levee deficiencies and potential flood risk will be reduced with the use of two-dimensional models because they account for the attenuation of flood peaks as they spill into the floodway. The lesser the need to address flood control problems, the lesser the opportunity and practical justification to relocate levees or incorporate other non-structural control measures. As we understand, the 2-D model you want used is best for project design of environmental measures, when we get to that phase.

Also, regarding hydraulic modeling of the project, flood control is one of the USIBWC 's major responsibilities; the other is water delivery. Both HEC-2 and HEC-RAS are models that have been developed by the United States Army Corps of Engineers (USACOE) and are accepted nationwide as a standard for flood plain management and flood insurance studies to evaluate floodway encroachments. The HEC-2 model developed in 1995 by the USACOE for the USIBWC and the HEC-RAS model developed in 2002 for the USIBWC are one-dimensional and steady state flow models. Both models analyze the water surface elevations at each cross-section (500 feet apart) based on different design flood flows. The design flood peak flows were developed by the USACOE as the 100-year flood event for different reaches of the project. The USIBWC believes that both models are appropriate for the flood control, channel improvement purposes, and for completion of the hydraulic studies associated with the EIS.

Regarding selection and analysis of channel-forming flows, you allege that channel-forming flows are those that mobilize bed material and create bank erosion. You also advocate retrofitting the outlet works of Caballo Dam to allow for greater discharge. As you know, flows are tightly controlled by a series of upstream dams as evidenced by the small number of documented significant flood events in the 65 years of project operation. The smaller, more frequent (1- to 5-year recurrence) overbank flows are most favorable for riparian development. These are the flows the project management alternatives exploit.

Flow regime (magnitude, frequency, duration, timing, and rate of change of hydraulic conditions) within the project reach was a primary consideration for virtually all environmental measures. Regulation of the stream flow has had little change since the early 1900's. Average discharges downstream of Elephant Butte Reservoir during summer conditions remained near 2,000 cfs until 1940, fluctuated from 500 cfs to 2,000 cfs during low-precipitation conditions prevalent for the following four decades, and experienced greater fluctuations during high-precipitation periods of the mid 1980s and 1990s. Consider, also, that current O&M activities require relatively little control of bank geometry given the upstream flow regulation. Since 1961 there has been little need for additional bank stabilization using riprap.

Regarding the retrofitting of Caballo Dam outlet works, it is not within the scope of our EIS. The proposed action you recommend should be explored with the United States Bureau of Reclamation, Rio Grande Project in whose jurisdiction is the dam.

Regarding frequency and timing of restoration flows, you say that Parsons does not give adequate consideration to timing, frequency and duration of restoration flows. Further hydraulic studies are anticipated to assist in the design of mitigation projects after the completion of the EIS.

Regarding analysis of sediment loading and transport, you say that one of the keys to designing self-sustaining restoration activities in the project reach is an accurate analysis of sediment loading and transport. Sediment load and channel morphology analyses are not a part of the reformulation report since the USACOE's HEC-6 Sediment Transport models for the USIBWC are still applicable. The USACOE four models are: 1) Average low-flow year which represents the 10-year lowest flow period, current river geometry and features; 2) Average high-flow year which presents the 10-year highest flow period, current river geometry and features; 3) 100-year return period storm, current river geometry and features; and 4) 100-year return period storm, current river geometry and features with recommended sediment control measures.

Regarding channel restoration, you say a main concern is failure to identify reworking channel geometry. You indicate that there are many methods to rework channel morphology, but fail to suggest what you are contemplating. The reformulation of alternatives report suggests several channel morphology treatments, including: open former meanders, modification of dredging at arroyos by creating embayments, whitewater/backwater habitat conditions created by erosion control protection structures at siphons and flumes, and channel bank shavedowns (more for riparian regeneration).

Regarding sources of environmental water, you say that the reformulation of alternatives report incorrectly states that water for environmental enhancement has "little or no political viability." You also recommend water banking. Low precipitation conditions prevalent in the Middle Rio Grande watershed severely restrict water availability in the project reach. As all river water and agricultural return flows in the project are fully allocated, water acquisition becomes a requirement for implementation of environmental measures for riparian corridor development, aquatic habitat diversification, and changes in flow regime. Such acquisition faces competing interests of municipal entities, making water acquisition a critical element in a river restoration program.

For nearly a century, flows along the project have been tightly controlled by a series of upstream dams which release water primarily to meet the needs of agricultural lands in New Mexico, Texas, and Mexico. As a result, water delivery needs control the flow regime along the project and limit the type and extent of environmental measures that can be implemented. The door on the concept of water banking is <u>not</u> closed by the alternatives under analysis. The reformulation report recognizes that water is a limited resource in the project reach but goes on to say that a viable restoration program will require cooperation with irrigation districts, compensation for water use, and incorporation of water conservation measures.

Regarding reduction or exclusion of restoration measures you are concerned about a perceived minimization or lumping of environmental measures into the Targeted River Restoration alternative. The project reach upstream from Leasburg Diversion Dam is the most likely candidate for emphasizing environmental measures associated with partial restoration of the Canalization Project. As the project extends downstream from Leasburg Dam it becomes more and more constrained by urban development as well as loss of pulse flow effects due to attenuation. This does not, however, mean that if the opportunity presents itself the environmental measures applied in the upper reach could not be used in the lower reaches also. Levee removal, as you advocate, is a very real possibility in the upper reach once a full understanding of structural deficiencies from ongoing studies is completed in 2004.

The assumption that the levee system dictates the extent of the active flood plain in the project reach is incorrect. The narrowing of the flood plain was actually induced by upstream flow regulation, not by the presence of the levees. With few exceptions the active flood plain is well within the levee system and, under the current flow regime, will retain its current configuration even if the levees were repositioned farther away from the stream for flood control purposes.

Unlike non-structural flood control programs implemented for rivers such as the Mississippi-Missouri with recurrent flood events - in which use of non-structural methods provides flood protection as well as environmental benefits - the use of non-structural flood control methods in the Canalization Project is primarily an economic and risk-management decision. Since flows are tightly controlled by a series of upstream dams, only a handful of significant flood events have been documented in the over-60 years of Canalization Project operation.

I hope this adequately responds to your concerns. We look forward to your comments on the draft environmental impact statement when it is released to the public soon.

Sincerely,

Debra J. Little
Acting Commissioner

copy of letter sent to:
R.C. Wooten, Principal, Parsons, Austin