

Rio Grande Floodway Project
General Reevaluation Report and
Supplemental Environmental Impact Statement
Independent External Peer Review (IEPR), Phase 1

Final IEPR Panel Comments, USACE Responses,
and IEPR Panel Backcheck Comments

July 25, 2012

Rio Grande IEPR Comments

Each Comment is formatted into four parts that include the following: (1) a clear statement of the concern (the Comment), (2) the basis for the concern, (3) the significance of the concern (the importance of the concern with regard to project implementability), and (4) the recommended actions necessary to resolve the concern to include a description of any additional research that would appreciably influence the conclusions. Comments are rated as “high,” “medium,” or “low” to indicate the general significance the Comment has to the sufficiency of the General Reevaluation Report and Supplemental Environmental Impact Statement (GRR/SEIS). The significance ratings are applied using the following criteria:

- High = Comment describes a fundamental problem with the project that could affect the recommendation or justification of the project
- Medium = Comment affects the completeness or understanding of the recommendation or justification of the project
- Low = Comment affects the technical quality of the reports but will not affect the recommendation or justification of the project

After the IEPR review period ended and comments were developed, Noblis consolidated and collated the final panel comments. The comments are arranged in order of significance. Of the final 58 comments, 14 were identified as having high significance, 24 were identified as having medium significance, and 20 were identified as having a low level of significance.

Minor editorial comments were provided to USACE under a separate cover letter.

Comment #1:
The economic analysis in Appendix F-10 suggests that the tentatively selected plan (TSP) is economical. The panel is not entirely convinced that this is true. Taken together, a large number of problems with the economic analysis could, if corrected, result in a non-economical project.
Basis for Comment:
<p>The estimated annualized cost of the TSP is \$8.214 million (Table F-15). This does not include operation and maintenance (O&M) costs, shown as an empty row in Table F-15. The Equivalent Annual Damages (EAD) for structures and contents alone may be as low as \$4.4 million (see Comment #2). Most of the other benefits involve the Low Flow Conveyance Channel (LFCC) and water losses. Depending on revisions, total benefits may not be enough to cover costs.</p> <p>The potential problems with the economic analysis, detailed in latter Comments, that could reduce benefits or increase costs, are:</p> <ul style="list-style-type: none"> A. Incorrect calculation of EAD. It appears that probability distributions used to calculate EAD for structures and contents may be different from distributions used to calculate EAD for other categories. B. The revised damage cost for LFCC is unknown. C. The lost water damage is overstated if some of the “lost” water is actually seepage to groundwater. D. Important O&M costs may not be counted. E. EAD may be overstated in the range of high-frequency, relatively small events if the existing spoil bank levee provides protection for events smaller than the 1-in-10 year event. F. Commercial contents damages may be over-counted or double-counted. <p>On the other hand, some Comments suggest that some benefits may be understated. These should be addressed and quantified where possible.</p>
Significance: HIGH
The economic justification for this project does not appear to be reliable
Recommendation for Resolution:
Rewrite Appendix F-10 to include recalculated EAD and issues identified above to improve the quality of the document and ensure the economic justifications are reliable.
USACE Evaluator Response (#1):
<p>Concur. The economic analysis in Appendix F-10 has been revised per A. and F.</p> <ul style="list-style-type: none"> A. Adopt: recompute EAD for structures and contents. B. Adopt: provide a revised EAD and benefits calculation (with sensitivity analyses) for the Low

Flow Conveyance Channel.

C. **Adopt:** Avoided water losses are no longer claimed.

D. **Adopt:** OMRR&R and mitigation costs have been computed and included into the benefit-cost calculations.

E. **Adopt:** The Bureau of Reclamation has provided additional details outlining the spoil bank levee's performance.

IEPR Panel Backcheck Comment (#1):

Concur.

Comment #2:

The panel is not able to verify that the economic analysis was done correctly. The approximate single occurrence damages in Tables F-5A and F-5B do not appear to be consistent with the EADs presented in Tables F-6A and F-6B of Appendix F-10. Possibly, the probabilities used to estimate benefits for structures and contents are different from those used to estimate other benefits.

Basis for Comment:

The panel attempted to duplicate EADs in Tables F-6A and F-6B using the common approximation formula as suggested by Figure F-5. In their response to an earlier question (USACE Responses_Rio Grande IEPR_supplemental information 24 Jan 12.doc) “*calculations based upon the FDA_StrucDetail.out file using 4 and 8 events*” were assumed to increase linearly from zero, for the 1-in-5 flood, to \$24.238 million for the 1-in-10 event, and damages for events larger than the 1-in-500 event are assumed to be the same as the 1-in-500 event. These assumptions were retained in our attempt to duplicate the Table F-6A and F-6B EADs.

A. The resulting total EADs, in thousand dollars (\$20,473 and \$20,470), were not extremely far from those shown in Tables F-6A and F-6B (\$32,210 and \$32,259, respectively); but the shares for structures and contents versus all other categories were not close. For example, as shown below, under present conditions: the EAD for structures and contents is estimated to be approximately \$4.4 million, not \$19.1 million as shown in Table F-6A; the EAD we estimate for everything other than structures and contents is \$16.068 million as opposed to \$13 million shown in Table F-6A. The attempt to verify EAD calculations, just for the structures and contents, for present conditions is displayed below.

Estimation of EAD, All Structures and Contents, Present Condition, Based on Table F5-A, all Dollar figures in 1000s						
Data provided in Table F5-A						
Event		10.0%	2.0%	1.0%	0.2%	0.0%
Mean single occurrence damages		24,238	35,087	39,887	49,228	49,228
Additional assumptions required						
Event	20.0%					
Mean single occurrence damages	0					
Estimation of EAD						
Probability interval		10%–20%	2%–10%	1%–2%	0.2%–1%	0%–0.2%
Event Pr in that interval		10.0%	8.0%	1.0%	0.8%	0.2%
Average damage in that interval		12,119	29,663	37,487	44,557	44,557
Interval Pr times average damage		1,212	2,373	375	356	89
Sum of all (Interval Prs times average damage in interval)			\$4,405			
Structures and Contents EAD from Table F-6A			\$19,067			

B. Structures and contents are about 20% of the event damages in Tables F-5A and F-5B (for example, \$24,679/\$123,315, Table F-5A), but well over half of the EADs shown in Tables F-6A and F-6B (e.g., \$19,067/\$32,210, Table F-6A). At the same time, all other event damages are about 80% of event damages shown in Tables F-5A and F-5B, but only 41% of EAD

shown in Tables F-6A and F-6B. The panel believes that because structures and contents are about the same share of event damages for every event, they should also be about the same share of EAD. Has the probability of events or the probabilities of levee failures been assumed to be different between the two damage categories?

In their response to earlier questions (USACE Responses_Rio Grande IEPR_supplemental information 24 Jan 12.doc) “calculations based upon the FDA_StrucDetail.out file using 4 and 8 events” the USACE responded that “It’s clear that using more events smoothes out the interpolations between events and increases EAD more in line with the EAD calculations developed by HEC-FDA. . .” However, the table for eight events provided with this response is substantially in error and a correction of the eight-event table does not support the USACE response.

Significance: HIGH

The response to panel question on this issue has been inadequate so far. Economic justification may be affected.

Recommendation for Resolution:

- A. Include a discussion following presentation of Tables F-5A and F-5B to explain how results in Tables F-6A and F-6B follow, or not. Recalculate EAD if necessary.
- B. Explain why contents and structures can be about 20% of without-project event damages but more than half of EAD. Or if there is an error, re-calculate EAD.

USACE Evaluator Response (#2):

Concur. A. **Not Adopt** as this information is already present- As a point of clarification, EAD is NOT computed from HEC-FDA’s “FDA_StrucDetail.out” file, but that file is generated “without risk” as an additional output of the program. HEC has stated they are uncomfortable using this file as the basis for computing damages for events of a specific recurrence interval. Paragraphs F-03 describes how event-damage relationships presented in Tables F-5A and F-5B were computed for structures, contents, vehicles, streets, utilities, agriculture, irrigation ditches. Para. F-06 describes the process by which tables F-6A and F-6B are created using HEC-FDA (for structures and their contents) or using the event-damage relationships created for other property types.

B. **Concur Adopt:** See response to Comment #1. The economic analysis in Appendix F-10 has been revised to recompute EAD for structures and contents, provide a revised EAD and benefits calculation (with sensitivity analyses) for the Low Flow Conveyance Channel.

HEC-FDA computes EAD using procedures documented in Appendix H of the HEC-FDA Flood Damage Reduction Analysis User’s Manual. Subsequent to this comment, the PDT contacted HEC for their perspective on the “damage by event” issue:

SPA request for information from HEC:

Getting this comment quite a bit in IEPR on our San Acacia study (you might recall this from late last year). Complying with ATR comments, we use the FDA_StrucDetail.out file to populate single occurrence information in FRM studies, but they don’t quite line up with EAD reported

from HEC-FDA. I'm not sure I'm the best qualified to explain the sources of some of the variance. From what I see, the FDA_StrucDetail.out file is computed "without risk" but I suspect it also ignores "Begin_Damg Depth."

Any thoughts as to the applicability of using this file to populate tables that describe individual event effects? I know Beth Faber and I chatted briefly about this at the workshop earlier this year. What follows is the current state of the comment and our response. I expect to see this A LOT in the future, at least until FIA is up and running across the Corps.

HEC response:

The FDA_StrucDetail.out file was created as a way to error check structure inventories. For example, if a first floor elevation was incorrect, then the damage (or depth of flooding) maybe too high or nonexistent depending upon the error. It has taken on greater use than what was anticipated. The results are computed without risk analysis and damage is not truncated for levees. Thus, if you have a levee, you will have to manually truncate the damage-probability curves as shown in the table. It does take into account the beginning damage depth.

The difference in EAD can be significant depending on the uncertainties about the discharge-probability, stage-discharge, and stage-aggregated damage curves. A better check might be to compare EAD computed from the FDA_StrucDetail.out file with that computed by FDA without using risk. You would still have to truncate damage from the FDA_StructDetail.out file for reaches with levees.

The "average" damage-probability curves might provide the best estimate of damage by return period. They are accessed in FDA by the menu item "Evaluation->Results->Damage by Analysis Year" and from within the "Damage Reach Summaries" box selecting the "Exceedance Probability – Damage Function". These curves show truncation due to levees. They are averaged by probability rather than damage so sometimes the upper end (>250 year return period) can look a little funny.

For this study, the exceedance probability – damage function contains 38 events. The resulting EAD varied based upon the assumptions made surrounding the start of damages, and the number of events used. For example, the following two tables present average annual damages for the present, without project condition based upon 5 event and 8 event data:

Avg. Ann.	From FDA_StrucDetail.out				
				Total	
00			106,018		
		0.002		106018.2	212.0364
500 yr	0.002		106,018		
		0.008		80716.35	645.7308
100 yr	0.01		55,414		
		0.01		52664.85	526.6485
50 yr	0.02		49,915		
		0.08		40723.41	3257.872
10 yr	0.1		31,532		
		0.1		15765.81	1576.581
5 yr	0.2		0		
					6218.869
Avg. Ann.	From FDA_StrucDetail.out				
				Total	
00			106,018		
		0.002		106018.2	212.0364
500 yr	0.002		106,018		
		0.008		80716.35	645.7308
200 yr	0.005		84,866		
		0.015		67390.59	1010.859
100 yr	0.01		55,414		
		0.01		52664.85	526.6485
50 yr	0.02		49,915		
		0.08		40723.41	3257.872
20 yr	0.05		40,829		
		0.15		27977.8	4196.669
10 yr	0.1		31,532		
		0.1		23329.08	2332.908
5 yr	0.2		15,127		
		0.01		7563.27	75.6327
5 yr	0.21		0		
					12258.36

Average annual damages for structures and contents using all 38 data points was \$8.486 million (compared to \$7.986 million for the presented results of the HEC-FDA modeling). Appendix E of ER 1105-2-100 requires studies describe the 0.2 percent, 1 percent and other key events to better describe the nature of the flood situation. This report describes the impact of key flood

events, but does not advocate “back of the envelope” calculation of EAD outside of the certified model. There are too many other factors going into HEC-FDA that make this “back of the envelope” calculation unusable, such as hydrologic years of record, errors associated with hydraulic stages for specific events, errors associated with structure elevation, errors associated with structure and content value, errors associated with the depth-% damage relationships used, etc...

IEPR Panel Backcheck Comment (#2):

A. Non-Concur. The text on page 11 of Appendix F-10 (page 10 of the new version) reads: “For each category, the aggregate value of property at each flood depth is combined with the depth-damage relationship to compute total, single event damages for each level of flooding. Tables F-5A and F-5B display the single occurrence damages by category for the floodplain evaluated. This is combined with the discharge-frequencies of the reference floods to produce damage-frequency relationships. Damage-frequency relationships provide probable average annual damages for each category under the conditions of each reference flood, and can then be compared to the hydrologic, hydraulic, and economic data analyzed within HEC-FDA. Tables F-6A to F-6C present the average annual damages computation from the HEC-FDA analysis.”

A paragraph or more should be added after this paragraph to explain why the average annual damages estimates in Tables F-6A and F-6B do NOT follow from Tables F-5A and F-5B. This explanation might be able to use some of the text in the HEC response above.

B. Non-Concur. The event-based calculation should be close to HEC-FDA result, which appears to be the case (i.e., \$8.486 is reasonably close to \$7.986).

However, the table for eight events provided in the USACE Evaluator Response #2, HEC response (page 8 of this document) is in error. Some of the interval probabilities in the 8-event calculation are erroneous (e.g., 0.008 should be 0.003; 0.015 should be 0.005). Also, for the 5-event calculation, damages at the 5-year event are 0 while they are 15,127 in the 8-event calculation (this number should be either 0 or 15,127 in both calculations). A correction of the eight-event table does not support the USACE response that “EAD varied based upon the number of events used.”

Therefore, the panel would like to verify the statement that “Average annual damages for structures and contents using all 38 data points was \$8.486 million (compared to \$7.986 million for the presented results of the HEC-FDA modeling). ...” To fully address the issue, COE should provide the 38 data points, preferably in Excel format. With this information, we can confirm the \$8.486 million estimate under the Phase 2 IEPR and resolve the issue in future updates to the EIS.

Comment #3:

Appendix F-10 (the economics appendix) is not especially well organized or written. This inhibits the ability of the expert panel to evaluate the economic analysis.

Basis for Comment:

Attention should be paid to producing a clean, more complete, stand-alone document that provides appropriate weight to the important economic, hydrologic/hydraulic, and geotechnical analysis.

General comments:

- A. Excessive documentation of alternatives not ultimately selected for non-economic reasons is probably not required. Consider putting such material in an appendix to the economic study.
- B. Make sure references in text to results are updated; for example, the text on p. 100 says the benefit/cost (B/C) ratio for the plan that maximizes net benefits, being the 100-year levee plus four feet, is 4.6. However, Table F-15, p. 41 shows a B/C ratio of 3.81 for the 100-year levee plus four feet based on annualized benefits of \$31,285 and costs of \$8,214. Benefits are from Table F-47-A-5.

Specific comments:

- A. For Section F-01, provide general discussions on the properties and economic activities that are at risk, the nature of floods and expected damages following a levee break, and how Cochiti and other facilities can be operated during a flood. The perched channel figure and discussion does not belong here; maybe move to Section F-05.
- B. Section F-02 is titled *General Computational Procedures* but the text presents data in Tables F-3A and F-3B. Use Section F-02 to explain the process generally and use Section F-03 to explain all data sources. Section 308 dealing with excluded property should have its own sub header.
- C. Section F-03 might be renamed *Types of Damages and Data Sources*. If F-03 must be named *Value of Property* perhaps add sub headers for property types.
- D. In Section F-04, uncertainty involving the probabilities of levee failures should be discussed. The probability of levee failures, both without and with project, should be a major source of uncertainty but this is not mentioned in the list on pp. 18–19. Is this what is meant by “*There are numerous factors which affect the frequency distributions as well as the rating curves for the study area’s hydraulic reaches. Those factors are discussed in detail in Appendix E*”?
- E. Discussion for the existing spoil bank levee, Section F-08, is inadequate; it does not reveal at exactly what event damages were assumed to begin.
- F. Section F-12, p. 39 should be changed to “Alternatives Considered and Results.”
- G. The presentation of results using Tables 48 and 49 in Section F-14, *Average Annual Benefits*, p. 97, is misleading. What is the point of showing results with just structures and contents, as in Tables F-48 and F-49? Suggest removing these tables. Table F-48-A references Table F-

11-A, which does not even exist in the document.

H. Section F-14, p. 97, text says “*Tables F-49A and F-49B show the expected B/C ratio for structures and contents in the baseline year and the project year 50 condition. It was not possible to show.... the benefit/cost ratio in.... F-49(A and B).*” Yet, Table F-49 does show B/C ratios.

Significance: HIGH

Economic justification may be in doubt if the documentation is not of sufficient quality to support it.

Recommendation for Resolution:

Appendix F-10 should be modified to address the issues identified above and in other Comments so that the economic analysis is reliable.

USACE Evaluator Response (#3):

Concur. See response to comments 1 and 2, above. It’s important to recognize that the Economics appendix is designed to support the General Reevaluation Report, so it may not be possible to create a stand alone Economics documents, as it would not contain the requisite supporting H&H, Cost, Environmental, and Geotechnical information needed to substantiate the claims and assumptions made in the Economics appendix. A substantial revision to the appendix was performed based upon new H&H data, as well as a complete revision of the damages and benefits attributable to the LFCC.

A. **Not Adopt:** This information is presented: -The nature of flooding was described extensively in the H&H appendix. Put simply, the flood threat stems from long duration, snowmelt events, as well as short duration, intense thunderstorms. Para. F-18 outlines the limited utility of “operating Cochiti Dam” to mitigate flood damage. The perched channel discussion in Para. F-01 was specifically requested by a prior internal review, in describing the study area.

B. **Adopt:** The appendix has been substantially rewritten per the latest analysis.

C. **Not Adopt:** The request for headers and sub headers appears to be an editorial comment rather than an analysis of the economic justification of the proposed project.

D. **Not Adopt:** This information is presented: Para. F-08 and F-11 of the Economics appendix, as well as the Geotechnical appendix, describes and substantiates the assumptions made regarding the existing, spoil bank levees.

E. **Not Adopt:** This information is presented: Para. F-08 of the Economics appendix asserts that the geotechnical analysis of existing levees could find no reason to support the existing levees providing ANY protection from flooding. Para. F-11 of the Economics appendix describes a sensitivity study that assumed the existing levees provided protection up to the 20% and even the 10% chance events.

F. **Not Adopt:** Per the USACE planning paradigm, the “six step process,” this was the portion of the process where the PDT evaluates alternatives and their effects, and begins making comparisons of those alternatives. There isn’t enough in Para. F-12 to advocate one alternative or

project size to state, “Here are the results,” and the PDT is more comfortable simply laying out the alternatives (the “alphabet soup” so to speak) and start screening.

G. Not Adopt: This information is presented: USACE guidance requires specific information about benefit distributions, but our certified models are not fully capable of implementing that guidance. In other cases, some property types (irrigation drains, recreation) were analyzed using concepts of risk and uncertainty that made them unsuitable in HEC-FDA. Structures and contents were the only property types that were put through the HEC-FDA model, for which a few metrics of the distribution of residual damages are even possible. Cost guidance is evolving RE “Risk and Uncertainty” and it appears that cost estimates in the future may come with a fixed based cost with a variable contingency to capture various confidence levels. However, this is where the technology has outpaced the guidance.

H. Not Adopt: The text referenced in the comment states, “It was not possible to show the distribution of residual damages, net benefits, or the benefit/cost ratio...” The sentence isn’t saying a ratio could not be generated. Rather, a distribution of the BCR is not possible in this analysis. USACE guidance (ER 1105-2-101) requires presentation of this information, which isn’t possible given the state of our certified tools.

IEPR Panel Backcheck Comment (#3):

Concur. The panel will revisit this issue in the Phase 2 IEPR.

Comment #4:
Construction cost estimates are only summarized for the Tentatively Selected Plan (TSP).
Basis for Comment:
The GRR/SEIS does not include a cost estimate for the TSP. As written currently, the construction cost estimates are presented only in summary form making it hard for the panel to verify the costs.
Significance: HIGH
The GRR/SEIS does not adequately discuss the breakdown of cost estimates for the TSP.
Recommendation for Resolution:
Modify the GRR/SEIS to include an overview of the cost estimates for the TSP consisting of major items: their units, quantities, unit prices, and costs. In addition to the basic cut and fill items, include foundation preparation, slurry wall, rip-rap, and cy-mile overhaul of spoil.
USACE Evaluator Response (#4):
Concur. Adopt: The GRR cost appendix has been updated to contain the standard summary report for the certified TSP estimate at a Civil Works Breakdown Structure account level along with the other required supporting documentation. This level of detailed cost estimate is onerous and unnecessary for the main body GRR-SEIS. If each discipline included data to this detail the main document would exceed 1000 pages.
IEPR Panel Backcheck Comment (#4):
Concur, since the proposed change will be addressed in the final draft GRR/SEIS.

Comment #5:
The GRR/SEIS needs to elaborate further on foundation preparation for the levee construction.
Basis for Comment:
Under the “long term high water” assumptions, the foundations for the levee can be expected to become saturated. Admittedly for a 43-mile-long levee it would not be practical to have enough borings and static pressure transmitters (SPTs) to know exactly what the foundation conditions are all along the route. It is known that where these foundations are loosely densified sands and silts, this leads to a perfect setup for liquefaction under seismic loading. Currently, the apparent plan is to strip, cut the keyway (inspection gallery), and then make a field judgment as to whether the existing foundation at every location is adequate as is, or where some sort of ground improvement is in order before embankment is placed. If so, what is it?
Significance: HIGH
Under earthquake loading this is a very important issue.
Recommendation for Resolution:
It is suggested that thought be given to doing some moderately deep compaction from the surface, after stripping and before the excavation for the keyway. BOMAG has a new vibrating roller with a thumping octagonal drum (as opposed to a circular drum) that, from the surface, can readily achieve dry densities of 95% Modified Proctor at a depth of 2 meters, even in material that was well dry of optimum.
USACE Evaluator Response (#5):
Concur. Adopt: Per EC 1110-2-6067 USACE Process for the NFIP Levee System Evaluation, if the PGA for the 100 year earthquake is less than 0.10g, no evaluation is required. The ground motion for the 100 year return period is 0.0349g according to the USGS probabilistic hazard curves, 2002 data. The probability of both a flood event and earthquake sufficient to cause liquefaction are considered remote, so moderately deep compaction was determined not necessary. A paragraph will be added that discusses these considerations for the project.
IEPR Panel Backcheck Comment (#5):
Concur , since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #6:
There is no discussion of the seismicity of the region.
Basis for Comment:
It appears that the GRR/SEIS relies on Section VI of the Feature Design Memorandum (FDM) No. 2 for “Geology and Soils” information. Para. 6-01.0 of the FDM describes the regional geology and mentions that the project is in a rift zone, but otherwise there is no discussion on the subject of seismicity. Para. 6-09.4 offers a very limited explanation of why there was no seismic analysis of the new levee, based on the strength of the embankment. The embankment is not the problem; the greater concern is the low blow counts in the foundation material that signal a vulnerability to the foundation. If there is a strong earthquake and those foundations are saturated (a probability), then there will be liquefaction of the foundations and slumping of the crest.
Significance: HIGH
This issue of the probability of a foundation failure under conditions of seismic loading should be addressed.
Recommendation for Resolution:
USACE should demonstrate that the probability of a strong earthquake on the causative fault—during flood—is sufficiently remote and that the risk will be assumed and the levee damage repaired if the event occurs. This should be stated and supported in the GRR/SEIS.
USACE Evaluator Response (#6):
Concur. Adopt: Earthquake analysis was not performed as the embankment in a dry condition is quite stable. For the embankment to be susceptible to liquefaction or slumping, saturation will be required. Since the flood crest time is limited, embankment seepage penetration is shallow and the potential of a joint event flood and earthquake is extremely remote; therefore, seismic analysis was not justifiable. Per EC 1110-2-6067 USACE Process for the NFIP Levee System Evaluation, if the PGA for the 100 year earthquake is less than 0.10g, no evaluation is required. The ground motion for the 100 year return period is 0.0349g according to the USGS probabilistic hazard curves, 2002 data. The risk would be assumed and the levee would be repaired if liquefaction were to occur. A paragraph will be added that discusses these considerations for the project.
IEPR Panel Backcheck Comment (#6):
Concur , since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #7:
GRR/SEIS makes the assumption that the existing spoil banks did not contain flood flows (Reference: p. 4-29, first bullet).
Basis for Comment:
The existing spoil banks appear to now contain flood flows. This assumption could be contributing to the high B/C ratio estimates.
Significance: HIGH
With this assumption, the stated benefits could be too high.
Recommendation for Resolution:
Modify the GRR/SEIS to include a definition of “flood flows” to help in determining whether existing spoil banks do or do not contain flood flows.
USACE Evaluator Response (#7):
Non-Concur. Not Adopt: Para. F-08 and F-11 of the Economic appendix documents that H&H and Geotechnical analysis does not support assigning ANY flood protection to the existing spoil banks. Further, the Bureau of Reclamation has indicated (in Para. F-11) that because the spoil bank levees have no foundation, the LFCC suffers a significant threat from the Rio Grande by waters seeping into the LFCC UNDER the existing embankment. There is no evidence to support the assertion that the spoil banks contain flood flows.
IEPR Panel Backcheck Comment (#7):
Concur.

Comment #8:
The levee details do not correspond to the GRR/SEIS.
Basis for Comment:
The GRR/SEIS should identify levees <5 ft in height will be constructed and provide a cross-section. It appears that Section A is for 5–12-ft-high levees and Section B is for greater heights, but this is not stated anywhere in the GRR/SEIS. Also, details on ancillary structure layouts, e.g., Brown Arroyo gates, Railroad Bridge, etc., would be helpful to understand what is planned. The report provides descriptions but no drawings.
Significance: HIGH
Need to identify where the various types of levee construction will occur. This would help to understand where the levees may be the most impacted, in terms of depth of water against the levee.
Recommendation for Resolution:
Add detail drawings to the report or appendix. A. Show all three types of levee construction, and how the <5-ft height levees would be constructed, including foundation and compaction. B. Treatments. Clarify what the other two cross-sections represent height-wise, and check against the verbal descriptions to match the graphical representation, e.g., toe drains will be one-third the base of levee width. Indicate on the plan view sheets which levee section is needed for each reach. C. Show preliminary layouts for levee openings, tie backs, sediment basins, and other significant cost facilities. Include O&M requirements, as appropriate. D. Show alignment and profile for the new Railroad Bridge, and graphically show how the bridge hydraulics and sediment transport issues are addressed. There is a verbal description, but it is difficult to visualize the facility and its location. Also discuss and show what will happen to the existing structure, and any cultural values.
USACE Evaluator Response (#8):
Concur - Levee superiority has redefined the levee’s vertical alignment since the GRR went out for review. A. Not Adopt: The new refined levee is greater than 5’ for the whole levee alignment and will be further refined during plans and specs. Therefore, a typical section for a levee less than 5’ is not required. A spreadsheet showing the difference in vertical height is available upon request. B Adopt Later: The station reaches, for the various typical sections, has been further refined in the technical appendix. C. Adopt Later: The ancillary structures mentioned have also been included and refined in the

technical appendix. See engineering technical appendix (provided for this backcheck) sheets C136 –C142 for typical levee section and ancillary structure information.

D. **Not Adopt:** The Railroad bridge replacement measure was screened out early in formulation therefore additional analysis and discussion is not warranted.

IEPR Panel Backcheck Comment (#8):

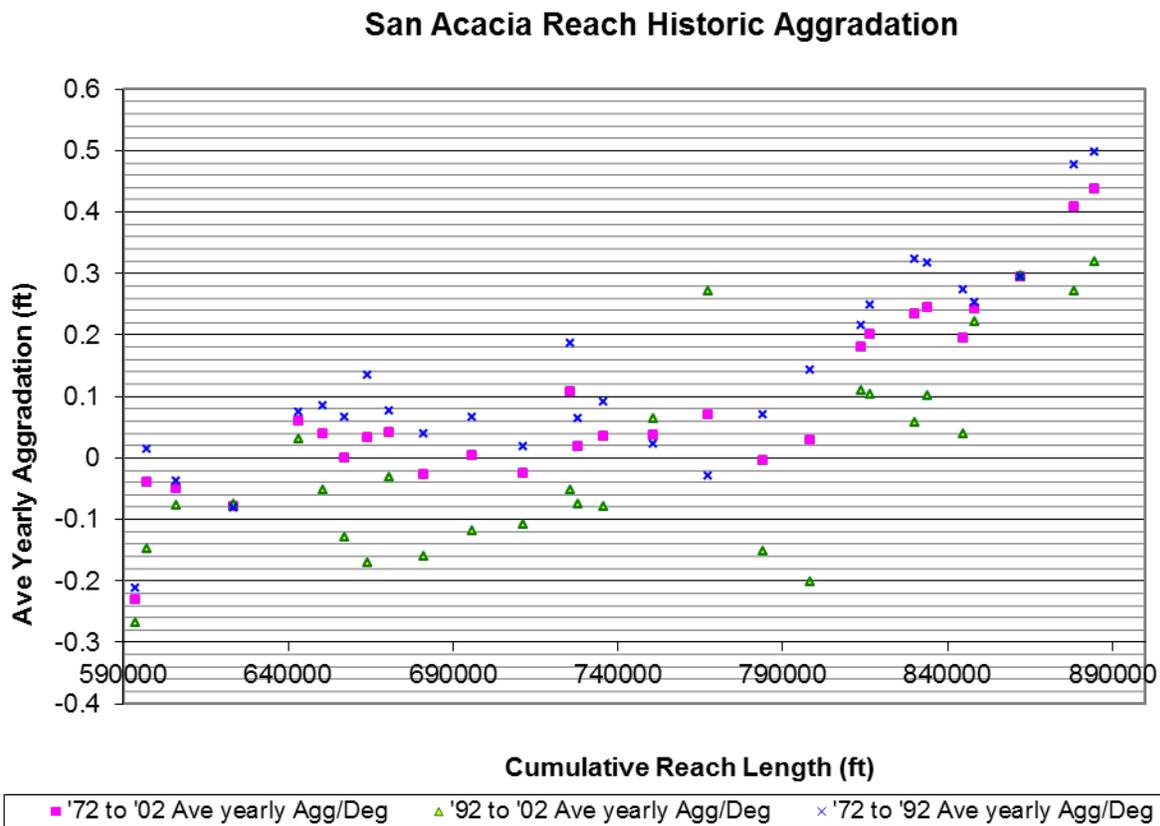
Concur, since the proposed changes (items B and C) will be addressed in the final draft GRR/SEIS. References should be included in the main text when information is presented in the appendices.

Comment #9:
The GRR/SEIS does not show the top of the levee and bosque access roads or ramps.
Basis for Comment:
Ramps to access the top of the levee, other than at ends, plus other levee crossings, e.g., Escondida Bridge, and access to bosque areas must be included.
Significance: HIGH
This addition to the levee construction will require substantial earth volumes and construction effort, which will impact project costs, construction schedules, revegetation, and habitat improvements, etc.
Recommendation for Resolution:
In the GRR/SEIS add the following: <ul style="list-style-type: none"> A. Details as to where and how these appendages will be constructed, while maintaining levee integrity and protecting the levee side slopes from erosion and degradation by unauthorized all-terrain vehicles or four-wheel-drive activity. B. A discussion of earth volumes, with remediation, that will be required for construction of these ramps. C. A discussion, with graphics, of what, if any, improvements are required for the Escondida Bridge and roadway embankment. If the levee height is raised at the roadway crossing, this will require adjustments to the vertical roadway profile for a significant distance away from the levee and across the floodplain. This will require widening the embankment base to maintain roadway widths, plus addition of wider shoulders per current roadway design criteria, all of which will require more earthen materials, with remediation, and additional construction costs.
USACE Evaluator Response (#9):
Concur. Adopt Later: The levee access ramps will be further refined during plans and specs. The project delivery team is currently working on preliminary plans and specs. Typical ramp sections and plan and profile sheets are available upon request.
IEPR Panel Backcheck Comment (#9):
Concur.

Comment #10:
There are several issues identified concerning the hydrologic, hydraulic, and sediment transport analyses.
Basis for Comment:
<ul style="list-style-type: none"> • Nowhere in the documentation provided is the process of the long-term sediment transport analysis described. This material should be included in the report. Telephone conversations with USACE personnel indicated that some of the information related to long-term sediment transport was included in other documents, not provided. Moreover, USACE personnel noted that approximately 12 historical sections, equally spaced, were used in determining the long-term transport. Twelve sections for analysis, however, is not enough to ensure that sampling errors are reduced, even in randomly selected data. The proper number of random samples ranges from approximately 30–35 samples, depending on the distribution (Moore & McCabe, 1993) to avoid sampling bias. Additional issues not yet apparent may also exist, but without the analysis methodology, addressing them is not possible. • It is difficult to understand how flooding depths, velocities, and sediment erosion/deposition were analyzed with the various tools—FLO-2D, HEC-RAS, comparison of river cross-sections, sediment Transport equations, etc.
Significance: HIGH
<p>Statistical significance of results depends on proper sampling size. Other analysis problems, as of yet unidentified, may exist.</p> <p>There should be some justification as to how the design flood depths were selected, how the bridge hydraulics were analyzed, and how erosion/sedimentation across the floodplain was determined.</p>
Recommendation for Resolution:
<p>The GRR/SEIS should be updated to include an appendix containing:</p> <ol style="list-style-type: none"> A. A description of the methodology for the analysis of long-term sediment transport. Additional sediment transport sections and analysis should be made of long-term sediment transport to ensure that sampling bias is not present in the results. It is presently recommended that the total number of sediment transport analysis sections totals 35. B. A summary discussion of how the various tools were used, the assumptions behind them, and the limits or risks from using these results. C. A map showing where the various models were applied, comparisons between the model results, how well the existing and proposed railroad crossings were modeled, etc., with graphics.
USACE Evaluator Response (#10):
Concur.

Not Adopt: The team apologizes for the misunderstanding that arose from the “12 historical sections” estimate. That value was quickly estimated in response to a question from the review team, but does not by any means represent the whole of the data that went into development of the future state used to represent long-term sediment behavior. In addition to other evaluations of long-term behavior the team prepared or reviewed, the PDT viewed the prototype as the best model, and relied primarily on comparison of a subset of “ag/deg” range lines in the study area, measured over several time periods. The team performed cross-sectional area computations for 29 ag/deg lines, from 1972, 1992, and 2002 surveys (n = 87), which were then used to assess long-term sedimentation. The below figure shows the values computed graphically within the study area.

B and C. Adopt Later: Information regarding the other items above is contained in the Engineering Technical Appendix, which will be provided with Phase II review.



IEPR Panel Backcheck Comment (#10):

Concur, since the proposed changes will be addressed in the final draft GRR/SEIS. It is important to note, however, that a complete discussion and presentation of all data should be found in the final draft GRR/SEIS engineering technical appendix. In particular, some discussion is needed relating how historical data regression analysis is applied to the new model.

Comment #11:
Additional detail on silvery minnow populations and distribution within the study area should be provided as a basis for ascertaining potential impacts.
Basis for Comment:
The existing conditions text provides an excellent summary overview of existing habitat conditions for silvery minnow but a more detailed assessment of the 40+-mile-long study area would appear warranted given that the project could directly impact this species. USACE should consider collaborating with USFWS to perform censusing of minnow populations by river reach to ascertain the most sensitive areas to be avoided and to determine precise impacts and mitigation measures necessary to offset them. If this information is already available, USACE should consider appending it to the SEIS.
Significance: HIGH
Understanding the spatial extent and quality of minnow habitat is critical to evaluating impacts to this endangered species.
Recommendation for Resolution:
Provide the requested information or indicate why it is infeasible in the text of the document.
USACE Evaluator Response (#11):
Concur. Adopt: The available silvery minnow habitat and population monitoring literature has been condensed to the issues relevant to the project. USACE participates in the Middle Rio Grande Endangered Species Collaborative Program (CP) along with the Fish and Wildlife Service. The CP supports minnow population monitoring and habitat management. The proposed levee alignment by default avoids sensitive minnow habitat. The soil cement wall has direct effects on minnow habitat & minnows that have been fully evaluated in consultation with the Service. The relevant silvery minnow literature is analyzed and cited in the Biological assessment and forthcoming Biological Opinion. The inclusion of these two documents in the report appendix will satisfy the comment.
IEPR Panel Backcheck Comment (#11):
Concur, since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #12:
There is insufficient documentation on ecological resources (outside of endangered species) to reach a conclusion regarding whether the proposed alternative should be chosen and also regarding impacts of the proposed plan on wildlife and aquatic resources.
Basis for Comment:
<p>Section 4.1.1 Ecological Resources does not provide sufficient background on methodology, rationale, or analysis to provide the technical support necessary to justify the selection of the proposed alternative from the perspective of impacts. At a minimum, the supporting documentation should be cited and appended to the GRR/SEIS. As such, the conclusion cannot be verified.</p> <p>Under Section 6, while extensive text has been written on potential endangered species impacts, there is little follow-up discussion on all the other wildlife discussed under existing conditions. Which species would benefit or be adversely impacted by the project? Would fish habitat (in general) be impacted? What other aquatic resources other than silvery minnows would potentially be affected? Was a rapid bioassessment or other evaluation of stream habitat conducted for comparison of alternatives? Were prior valuation studies performed for the 1992 GRR/SEIS incorporated into the analysis of impacts or selection of alternatives?</p> <p>In addition, the text should note the relationship between water levels, changes in phreatophytic water use (with both salt cedar eradication under No-Action, and with vegetative removal for levee construction and with woody vegetation exclusion on the new levees), and their impact on fish and wildlife habitat within the area affected by the proposed levee so that project impacts can be more readily evaluated.</p>
Significance: HIGH
More detail is required to evaluate the conclusions of the GRR/SEIS.
Recommendation for Resolution:
Provide more detail on studies undertaken to date and project impacts on the basis of existing conditions data already reported. Discuss any changes in water salvage to increase or decrease river flows and water table elevations.
USACE Evaluator Response (#12):
<p>Concur.</p> <p>Adopt: The text will be revised to state that impacts were based on the results of many studies of middle Rio Grande valley riparian habitat types conducted over the past 30 years which has consistently related floristic and physiognomic characteristics with wildlife use. The relative value of various riparian communities has been well documented for birds, herptiles, and small mammals. The revised GRR/SEIS quantitatively evaluates the impacts to riparian vegetation and the value of mitigative plantings based on breeding bird densities from censuses in similar</p>

habitat types along the Rio Grande.

Several recent studies along the Rio Grande in New Mexico have estimated evapo-transpiration rates for various riparian vegetation types. These facilitate the quantitative estimation of differential water use among types. Whether vegetation management and habitat restoration activities actually result in salvageable water is still debated. The Corps will confer with resource managers in the project area to determine if the differential evapo-transpiration losses are, in fact, a concern based on the size of the affected area, and will evaluate that effect amongst the alternatives in the GRR/SEIS accordingly.

IEPR Panel Backcheck Comment (#12):

Concur, since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #13:

The text would benefit from a more complete and cogent discussion of the overall potential project impacts to the Southwest willow flycatcher (and other riparian species) in terms of population impacts, habitat impacts, and potential mitigation measures.

Basis for Comment:

Table 4.11 summarizes project impacts to the Southwest willow flycatcher as “*minor impacts resulting from removal of riparian vegetation in the southern two-thirds of the project.*” The southern two-thirds would consist of a 28-mile-long area; depending on the width and extent of cutting, the impacts could be significant. Moreover, impacts from the authorized project are described as “unknown.” More clarification and elaboration is needed; at a minimum, an explanatory footnote is warranted.

Section 6.6.5 concludes that there would likely be impacts to flycatcher habitat. However it stops short at that point of addressing whether the impacts would be adequately mitigated. While mitigation has been proposed for vegetation, the text should address proposed mitigation measures for endangered species habitat, or at least the process that will be followed to achieve interagency concurrence regarding mitigation requirements.

Further, Section 6.4.2 addresses mitigation proposed for disturbance to riparian vegetation from construction of the proposed project. The text states, “*For the construction of the proposed, A +4 ft alternative, a total of 36.2 acres of riparian vegetation within the floodway would be removed to accommodate the levee structure and Vegetation-free Zone (Table 6.4). Considering the net increase of about 74 acres in the floodway after construction of the proposed levee, approximately 35.2 acres of that area would be suitable for planting, or otherwise establishing, riparian vegetation. All of this plantable area would occur between the upstream end of the levee alignment and BDANWR. Following construction, the Corps would reestablish 36.2 acres of woody riparian vegetation within the floodway, or on lands managed by BDANWR.*” It is not clear how the mitigation requirements (apparently 1:1 replacement of vegetation) were arrived at and if the habitat quality data collected during the 1992 GRR/SEIS were incorporated into the proposed mitigation plan. While it is understood that the majority of vegetation impacts are to invasive salt cedar, the fact that mature woody vegetation will take some time to become reestablished suggests that greater than 1:1 replacement may be warranted. Further, the vegetative impacts summarized in Table 6.4 are not sufficiently detailed (e.g., native versus non-native) for the reader to come away with a clear picture of impacts. Are the non-native impacts to mature cottonwood trees or to young coyote willow? The difference has a bearing on re-establishment time, habitat quality for different species, and ultimate mitigation requirements. The bottom line is that the text should address how these measures will offset the potential impacts to the Southwest willow flycatcher as well as other species using the riparian zone and why that plan is the best way to mitigate for the impact.

For example, the text on p. 2-24 states “*The largest breeding population of flycatchers along the Rio Grande in New Mexico occurs in the upper reaches of Elephant Butte Reservoir, approximately 5 miles downstream from the San Marcial Railroad Bridge. Receding lake levels*

allowed the establishment of riparian shrub species that were quickly colonized by the flycatcher.” If true, this suggests a potential mitigation measure for any impacts to willow flycatchers should USACE, USFWS, U.S. Bureau of Reclamation (USBR), and the local water conservancy be able to come to agreement on management of water levels in the reservoir to encourage habitat establishment along the lake margins.

Significance: HIGH

More detail is required to determine whether impacts would be significant.

Recommendation for Resolution:

Revise the text to clarify how proposed mitigation measures will offset the referenced potential project impacts to the Southwest willow flycatcher.

USACE Evaluator Response (#13):

Concur

Adopt: The revised report contains a detailed mitigation plan quantitatively evaluating affected habitats and a comparison with the expected value of mitigative plantings. Effects to endangered species habitat has been detailed in the Biological Assessment (pursuant to the ESA) and included as an appendix to the GRR/SEIS. While sufficiently detailed, the mitigation plan is still preliminary. Consultation with the USFWS is ongoing, as is coordination with two National Wildlife Refuges (where the majority of habitat effects occur). The mitigation plan will be finalized before submitting the final GRR/SEIS for approval.

We hesitate to make quantitative estimates of the effects of the authorized plan because of the sparse information on resource conditions in 1948.

USACE and the project sponsors lack all authority regarding the operation of Elephant Butte Reservoir. Reclamation is in the process of consulting on its future operation with the USFWS.

IEPR Panel Backcheck Comment (#13):

Concur, since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #14:
The project requires a detailed mitigation plan for the silvery minnow impacts.
Basis for Comment:
<p>While it is recognized that Phase II of the IEPR review will likely deal with mitigation issues once it is determined whether the proposed project should proceed, evaluating ecological impacts is difficult without a detailed mitigation plan in place. For example, in Subsection 6.5.1. the text notes “<i>Maintenance of suitable silvery minnow critical habitat remains dependent on routing flow within the existing floodway to maximize fluvial processes during flood events.</i>” It would be helpful for the text to follow this paragraph with a quick bulleted summary of how that flow routing will be maintained.</p> <p>In addition, a detailed mitigation plan with alternatives considered should be developed that would ensure project impacts do not adversely affect that species.</p>
Significance: HIGH
It cannot be determined whether impacts on this species would be effectively mitigated.
Recommendation for Resolution:
Developing a mitigation plan that evaluates potential alternatives for mitigating project impacts can be done in parallel with ongoing design studies for finalizing the project, regardless of whether the proposed project proceeds exactly as planned. Included within this evaluation could be further consideration of measures that might be undertaken to prevent or offset minnow mortality should the Tiffany Basin portion of the project be implemented.
USACE Evaluator Response (#14):
<p>Concur.</p> <p>Adopt Later: The Tiffany Sediment Basin measure is screened for unacceptable impacts to both endangered species and surface water losses. The feature was also an economic drag on the project and therefore not included in the recommended plan. The desired flow routing for dynamic habitat creation is achieved by levees designed to handle the 1%-chance flood event. The paragraph discusses the basic concepts for flood processes to maintain suitable minnow habitat. There is minimal loss of minnow habitat resulting from levee construction. The effects of the project are analyzed in the Biological Assessment in consultation with the Service. The relevant silvery minnow literature is analyzed and cited in the Biological assessment and forthcoming Biological Opinion. The inclusion of these two documents as well as the inclusion of the mitigation plan in the report appendix will satisfy the comment.</p>
IEPR Panel Backcheck Comment (#14):
Concur, provided additional information will be included in Phase 2.

Comment #15:
It is important for the GRR/SEIS to be a stand-alone document. There are numerous instances where the panel was unable to corroborate GRR/SEIS findings because the data were not provided or analysis methodology was not described in a readily understandable form. Considering that several supporting analyses for this GRR/SEIS are based on existing documents that go back to 1948, the GRR/SEIS should provide appropriate page and paragraph references to pertinent existing documents through the use of summaries, footnotes, etc. in the GRR/SEIS. Where noted elsewhere in the Comments, appendices should be revised for clarity in support of conclusions of the SEIS so that findings may be corroborated.
Basis for Comment:
The GRR/SEIS should be a stand-alone document to provide a complete description of the analysis methodologies used and conclusions reached.
Significance: MEDIUM
A stand-alone GRR/SEIS would make it is easier to understand the project, thus minimizing unnecessary comments on GRR/SEIS.
Recommendation for Resolution:
Modify the GRR/SEIS to include references to the materials (as summary text or footnotes) in previous work that are relevant to this GRR/SEIS.
USACE Evaluator Response (#15):
Concur. Adopt: Whereas the comment is not specific to instances where conclusions were difficult to corroborate, specific quotations from House Document 243 occur in Chapter 2 and Chapter 7 and were referenced elsewhere in the document. The following changes specific to this comment were made: References to technical appendices were verified. In two instances (Section 4.7.4.1 and 6.4.2.4 b) page numbers were provided for pertinent discussion in that appendix. In all other cases where a reference to an appendix was made, the specific information to corroborate a reference is entails many pages or a general conclusion of the analysis provided in the appendix overall. Therefore a quick reference other than the one provided is not possible. Excerpts from a report of investigation attached to the geotechnical appendix is brought forward to the main document to better describe what is considered a “failure” of the spoil bank (seep, boil, piping, sloughing) in section 1.4.1 Flood History. Excerpts discussing the integrity of the existing spoil bank through this investigation was added to section 1.4.1 Flood History. This information is reiterated in the without project condition section 3.1.2 Geology and Soils and 3.5.2 Flood Hazard and 3.5.4.1(b) flood risk management.

IEPR Panel Backcheck Comment (#15):

Concur, since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #16:

The various sections of the report do not consistently support the assumption that flood damages start in the 1-in-5-year event. The level of damages assumed for a 1-in-5-year event should be displayed in the document. Additionally, if damages were included for flood events larger than the 1-in-500-year flood, these should also be displayed. At least, additional support for the current assumption and a review of text for consistency is suggested.

Basis for Comment:

Per Appendix F-10, p. 22: *“This study’s hydrology and hydraulic evaluations assume that flood events of a magnitude greater than the 20% chance event damage structures, contents, and vehicles in the flooding areas analyzed.”* This assumption is supported by the geotechnical analysis, but not clearly supported by the recent history of flooding. From Appendix F-10, p. 21, *“upstream dam releases are kept to below 7,000 cfs, which corresponds to somewhere between the 20% and 10%-chance events in this study.”* From the GRR/SEIS II, p. S-2, flood fighting has been used in recent years (1976, 1979, 1995, 2005) to avoid levee failures. According to the information provided to the panel from the District, the adjusted peaks during these years were 6980, 6780, and 6350 cfs, respectively, with a measured 2005 peak discharge of 5,980 cfs, and *“these peaks all fall within exceedance probabilities between 50% and 80%.”* This statement is not consistent with the information provided in Appendix F-10. From the GRR/SEIS, p. S-2, *“The start of damages is estimated to occur at a 20- to 14-percent chance flood event.”*

Damages for the 1-in-5-year event are not displayed in Appendix F-10. In the USACE response “USACE Responses_Rio Grande IEPR_supplemental information 24 Jan 12.doc,” two tables “calculations based upon the FDA_StrucDetail.out file using 4 and 8 events” are provided that suggest that the expected value of damages is assumed to be zero at the 1-in-5 event, increasing linearly to the 1-in-10 event. Also, damages for events larger than the 1-in-500 event in these tables are assumed to be the same as the 1-in-500 event. This information should be provided in the document.

After review of the information provided, the panel can only conclude that the existing spoil bank levee with a flood fight appears to provide some chance of protection for events larger than the 1-in-5 event. If so, the analysis may be overstating benefits of the new levee.

Significance: MEDIUM

The inconsistent statements regarding the reliability of the existing spoil bank levee should be reconciled.

Recommendation for Resolution:

Explain what single-occurrence damage levels were used to calculate damages in the range of the 1-in-5 flood to the 1-in-10 flood, and for events larger than the 1-in-500 flood, if applicable. This might include a discussion of how the Hydrologic Engineering Center’s Flood Damage Analysis (HEC-FDA) calculated EAD based on data inputs.

Include avoided flood fighting costs as economic benefits. However, if the data soundly support failure of the existing system in a 1-in-5-year event, provide documentation and resolve the inconsistencies in the various sections within the report regarding the reliability of the existing levee and storage system.

USACE Evaluator Response (#16):

Concur.

Adopt: HEC-FDA does not generate point estimates of flows, stages, or damages for a specific event. The software, essentially, performs a statistical analysis of hydrology, hydraulic, and economic information using concepts of risk and uncertainty, meaning that a specific event frequency can have a range of flows, stages, and damages as a result of all the variables entered into the study. The comment seems to be asking “What’s the information for the 10% chance event?” which is a complicated answer. Tables F-3, F-4, and F-5 (A and B) attempt to provide this information, which is the product of the “FDA_StrucDetail.out” file in HEC-FDA, but for reasons previously outlined (see response to Comment 2), this is an imperfect means to meet the requirements of ER-1105-2-100.

The PDT did ask the Bureau of Reclamation for their flood fighting costs, and any savings in the event the proposed project was constructed. Para. F-11 of appendix F-10 contains the text of that solicitation. The Bureau was unable to provide that information.

Due to channel morphology along the project length, flows that cause damage vary somewhat, therefore the range of events captures some of this variation. The discussion from a investigation of the spoil bank conducted in 1995 presented in the geotechnical appendix was added to the main document. The discussion describing what is considered a “failure” of the spoil bank (seep, boil, piping, sloughing) is presented in section 1.4.1 Flood History. The Discussion also includes examples of failures that have occurred in years preceding the investigation. Additional language has been added to demonstrate the nature of failure of the spoil bank and the point at which failure occurs, specifically, foundation failures are observed before water reaches the toe of the spoil bank. This supports the conclusion that start of damages occurs 14-20% exceedance event in the lower reach. This information is reiterated in the without project condition section 3.1.2 Geology and Soils and 3.5.2 Flood Hazard and 3.5.4.1(b)

IEPR Panel Backcheck Comment (#16):

Concur. The panel will revisit this issue in the Phase 2 IEPR to ensure that economic damages in the HEC-FDA high-frequency events are comparable to what has occurred recently during such events.

Comment #17:
Low Flow Conveyance Channel (LFCC) damage estimates are planned for revision. Without revised estimates, the panel cannot tell how the economic analysis may be affected. The revision should include more detailed documentation of LFCC damages.
Basis for Comment:
Appendix F-1 and USACE initial comments. It appears that damage estimates for the LFCC will be revised; the net effect on the benefits analysis is not clear. Regarding the depth-percent damage estimates for the LFCC from the USBR: <i>“We are re-soliciting this and other issues and expect to revise these assumptions accordingly.”</i> LFCC damages currently account for most of the single event damage estimates for the high-frequency events and account for close to half for the low-frequency events (e.g., Table F-5A); but, a reference to damage information is not provided; <i>“Bureau of Reclamation personnel provided the stage- %damage relationship used in this evaluation”</i> is not enough.
Significance: MEDIUM
Since LFCC damages are a large share of EAD, revisions could result in important changes to economic justification.
Recommendation for Resolution:
Use revised estimates. Provide a citation for LFCC damages and provide appropriate discussion of methods and results.
USACE Evaluator Response (#17):
Concur. Adopt Later: LFCC damages and benefits were recomputed per Para. F-11 of the Economics appendix.
IEPR Panel Backcheck Comment (#17):
Concur. The panel will revisit this issue in the Phase 2 IEPR to check the accuracy of revised damages and benefits.

Comment #18:
Provide more discussion of commercial contents in Appendix F-10.
Basis for Comment:
Commercial contents account for more than half of Table F-5A single occurrence structure and contents damages, and more than 10% of total damages. According to information provided to the panel on 13 January 2012, “1) Several structures (97) identified in the field inventory are nothing more than large metal awnings containing bales of hay”; but, the report suggests that hay storage is covered in outbuildings. From Appendix F-10, p. 110: “In the present evaluation, outbuildings referred to material storage sheds, shelters for vehicles or covered storage, like hay storage buildings.”
Significance: MEDIUM
It appears from these conflicting statements that stored hay could be double-counted.
Recommendation for Resolution:
Explain what commercial properties are responsible for the current commercial contents EAD estimate, and what the commercial contents are. Ensure no double-counting is occurring.
USACE Evaluator Response (#18):
Concur. Adopt: The PDT reexamined the economic inventory to ensure that no double counting, as in a particular line of inventory coding was used more than once. The determination of whether a particular structure was an “Outbuilding” or a “Commercial Structure” was pretty arbitrary, and was largely dependent upon the size of the structure being considered. Larger structures were assumed to have a commercial purpose.
IEPR Panel Backcheck Comment (#18):
Concur.

Comment #19:
Discuss the schedule for levee construction for various stages of the Rio Grande, and include the maximum length of the existing levee that the specifications will allow to be opened at one time.
Basis for Comment:
Using the existing levee as a borrow pit to construct the new levee at the same alignment means to be constantly breaching the existing levee. Figure 1.3, p. 1-10, <i>Comparison of Spring Snowmelt Hydrograph and Summer Rainfall Hydrograph</i> , depicts July–April as the months of the year that minimize the risk associated with these breachings. Is that a proper interpretation of Figure 1.3? It is important for the GRR/SEIS to clearly establish the reasonable length of the levee that can be breached at any one time (e.g., 500 ft?). In addition, will threatened and endangered (T&E) species requirements reduce the available construction window? And how will habitat impacts be mitigated during and after construction?
Significance: MEDIUM
This issue impacts the logistics of the construction.
Recommendation for Resolution:
The Government should perform an analysis to determine the reasonable length of the levee that can be breached at any one time, and how construction impacts to T&E species will be mitigated.
USACE Evaluator Response (#19):
Concur. Adopt Later: Construction scheduling has been addressed and further defined in the technical appendix. Issue will also be addressed during plans and specs. See para. 8.12 WATER CONTROL AND ORDER OF WORK DURING CONSTRUCTION in the technical appendix for additional information.
IEPR Panel Backcheck Comment (#19):
Concur , since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #20:
The GRR/SEIS, does not provide the approximate station limits for levee height >5 ft (Reference: p. 4-18, para. 1 and Appendix F-7).
Basis for Comment:
These are the limits of the inspection trench and the slurry wall. The cost of the slurry wall does not appear to have been included in the cost estimate and yet it is a significant item. Also, it is presumed that where the levee is <5 ft high, the work merely consists of: excavating the old levee, foundation preparation, replacement of the excavated material as compacted embankment, and disposing of any excess material derived from the excavation.
Significance: MEDIUM
The slurry wall is an important stand-alone cost item that should not be included under the contingency allowance.
Recommendation for Resolution:
Revise the GRR/SEIS to give the station limits where the levee height is >5 ft, briefly describe the proposed construction where H is >5 ft and where H is <5 ft, and include an overview of the cost estimates (per Comment #4) that includes the cost of the slurry wall.
USACE Evaluator Response (#20):
Concur. Adopt: Levee superiority has redefined the levee's vertical alignment since the GRR went out for review. The new refined levee is greater than 5' for the whole levee alignment and will be further refined during plans and specs. Therefore, a typical section for a levee less than 5' is not required. A spreadsheet showing the difference in vertical height is available upon request. The station reaches, for the various typical sections, has been further refined in the technical appendix. See technical appendix sheet C141 for typical levee section. See also response to comment 4 for cost information.
IEPR Panel Backcheck Comment (#20):
Concur, since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #21:
Minimizing the amount of spoil hauled to Tiffany Basin by disposing of it onsite could result in significant cost savings.
Basis for Comment:
The average round trip haul to Tiffany Basin is about 40 miles. To load, haul, dump, and spread this 3.9 million cy must run at least \$6 million/cy. Minimizing the hauling of spoil to Tiffany Basin could result in a significant cost savings.
Significance: MEDIUM
It is noted that there is potential for significant cost savings in minimizing hauling spoil to Tiffany Basin; however, the USACE has provided a rationale for not selecting this option.
Recommendation for Resolution:
Modify the GRR/SEIS to include an explanation justifying why USACE is hauling spoil to Tiffany Basin rather than onsite, which could result in significant savings. Place as much spoil material, as it is safe to do so, as compacted fill against the outer slope of the design section near where cut is in excess of fill.
USACE Evaluator Response (#21):
Concur. Adopt: Levee height optimization resulted in the larger levee (Base Levee plus 4-ft). Largely due to the savings in use of cut vs haul of excess material. Where practicable, excess material is to be spoiled on the land side of the levee to the extent that the larger levee footprint did not result in additional fish and wildlife mitigation costs. The last sentence in 4.6.5 Levee Sizes and 4.6.5.2 Benefits state that additional costs are realized as the levee footprint get wider. Section 4.7.1 Ecological Resources provides additional detail for remaining within the footprint of the existing spoil bank. The cost estimate reflects locally spoiling this material versus hauling it to the Tiffany Basin. The cost estimate also attempts to minimize the miles that each cy of material is hauled. Additionally, a Crystal Ball risk analysis was performed for the TSP and one of the items analyzed was the potential savings if the government or contractor is able to locate spoil area(s) closer to the work area under construction at the time. These savings are recognized in the estimate by the contingency rate calculated by the risk analysis and applied to the project cost.
IEPR Panel Backcheck Comment (#21):
Concur , since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #22:
From the discussions in the GRR/SEIS, it appears as if groundwater recharge is considered a water loss (Reference: , p. 2-34, second to last paragraph, Line 3).
Basis for Comment:
The GRR/SEIS describes an average savings of 32,000–47,000 acre-feet of water annually, partially because of reduction in groundwater recharge. This is contradictory in that groundwater recharge saves water.
Significance: MEDIUM
Groundwater recharge and reduction in groundwater recharge language is not clearly understood.
Recommendation for Resolution:
Saving water constitutes a significant benefit and USACE should consider editing the benefits listed in the GRR/SEIS to reflect this.
USACE Evaluator Response (#22):
<p>Concur.</p> <p>Adopt: This section primarily discussed the LFCC and its purpose. Surface water seepage or infiltration (recharge) to groundwater is considered not delivered for the purposes of water delivery under the Rio Grande Compact and treaty with Mexico. As stated in the previous paragraph regarding the LFCC “The purpose of the LFCC is to transmit river flows through a critical water-loss area, thus preventing the flows from spreading across the wide floodplain and subsequently dissipating by high evaporation, high seepage, and phreatophytic-vegetation transpiration.”</p> <p>The following language was added to the end of this section: “Whereas infiltration of surface water is considered a loss in terms of delivery of surface waters to downstream users, there is an unquantified benefit to the local groundwater recharge. The groundwater aquifer in this area is used for municipal and agricultural water supply. Recharge is necessary to sustain this valuable resource”</p>
IEPR Panel Backcheck Comment (#22):
Concur, since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #23:
The GRR/SEIS discussion on the Railroad Bridge is not consistently described.
Basis for Comment:
As currently written, the subject of the Railroad Bridge comes up in a number of places throughout the text and the back-up references, and is not consistent and requires clarification. It appears that the bridge is not in Alternatives A or K, but was in most of Alternatives B–J. It is also stated that if there is no “hydraulic connection” between the levee and the bridge, the Federal Government has no authority to replace it although there seems to be a hydraulic connection. Then a statement is made to the effect that because of global warming, there will likely be more serious flooding. On p. 2-36 it is stated that the railroad claims that the bridge is good for another 50 years “unless a large event occurs.” Finally, it is concluded, without backup, that there will be no “large event” in the next 50 years, so the bridge stays. Section 4 would benefit from having a paragraph on the Railroad Bridge that clears up the discrepancies.
Significance: MEDIUM
The current discussion on the Railroad Bridge is not clearly described, which could lead to a misunderstanding by the reader.
Recommendation for Resolution:
Modify the GRR/SEIS (e.g., Chapter 4) to include a single paragraph on the Railroad Bridge that provides the reader with a clear understanding of the complete history of the Railroad Bridge.
USACE Evaluator Response (#23):
Concur. Adopt: Section 2.7.4.2 Transportation Facilities provides a brief discussion of the bridge, a history or bridge elevations as the channel aggrades and several statements that absent a large flood the bridge would continue to operate. That is, it’s structurally sound and would last 50 years if not washed away. It also states that the threat of failure during a moderate to large flood event is very real. Section 3.5.4.2 contains a confusing statement referring to the continued function of the bridge due to structural integrity. The paragraph was revised to state: “The primary transportation facility within the area is the BNSF railroad. The BNSF bridge at San Marcial is currently in the floodplain of the Rio Grande and is at risk of being damaged or destroyed from moderate or large flood events. The BNSF has no plans to replace this structure in the near future. They do recognize the flood risk but currently consider it to be acceptable. It is Reclamation’s intention to maintain the channel such that the current capacity of the bridge is not further reduced. Their maintenance program will continue into the future until the structural integrity of the bridge deteriorates to the point it must be replaced. However, this is not expected to occur within the next 50 years, which is the period of analysis covered by this report. It can be concluded, that without a Federal project, the railroad bridge would continue to function as it does under current conditions or until a large event

destroys the bridge and it is replaced with a bridge elevated above the floodplain.” This revision should address the inconsistency identified by the commenter however additional revisions were made in chapter 4.

Chapter 4 was reorganized per review comments so that the discussion of a bridge replacement as a flood risk management feature is now located in section 4.5.5 6). The last paragraph was revised to read “Although replacement of the bridge would be a wise investment, it is not within the authority of the USACE to replace the bridge absent induced damages from a Federal project. Table 4.3 shows that there is no difference between with and without project closure and damage events and a slight increase in frequency of destruction events, however this difference does not constitute a significant increase of induction of damages by a levee project.”

IEPR Panel Backcheck Comment (#23):

Concur, since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #24:
The GRR/SEIS discussion on flow and sediment transport analyses for all bridges, and especially the Railroad Bridge, must be more detailed.
Basis for Comment:
In addition to the existing bridge issues, a detailed discussion of the proposed bridge analyses should be included, with alignment maps. All pertinent data, including but not limited to, water surface impacts, short and long term changes to channel and local (pier and abutment) scour, and hydraulic design rationale for the existing and new bridge locations and configurations should be presented, to supplement the existing brief discussion.
Significance: MEDIUM
It is not clear as to what impacts the existing and proposed railroad and/or highway bridges will have on levee performance, back-water effects and sediment transport.
Recommendation for Resolution:
Add a discussion, with appropriate graphics and value functions, as to existing levee performance (hydraulic impacts, flood plain issues, and sediment transport) with the existing bridges; as well as proposed levee performance with existing and proposed bridges.
USACE Evaluator Response (#24):
<p>Non-concur.</p> <p>Not Adopt: This level of detail is not appropriate for the GRR-SEIS main body since it does not distinguish one alternative from another. All alternatives were evaluated based on performance which included H&H modeling of the existing channel with the diversion dam, bridges and other hydraulic features. The team did look at replacement of the Railroad bridge as a potential method of conveyance improvement, but authority to do so was not identified. Since this potential feature was eliminated from alternatives due to no authority to implement, it is inappropriate and potentially misleading to include the level of information (e.g., alignments, pier/abutment scour estimates) the review team requests regarding the RR bridge in the report. The forthcoming Engineering technical appendix does include additional information for the recommended plan.</p> <p>The information presented for the final array of plans including the recommended plan was modeled for the existing bridge. All plans that included the bridge replacement feature were screened out early.</p> <p>Two different boundary conditions were prepared for the downstream end of the model – one for the existing RR bridge, and one for the proposed replacement. The latter of these was abandoned when it was determined we did not have authority to replace the bridge. Prior to that, a significant amount of information was developed for both conditions (existing-, replaced-bridge) for comparative impact/benefit evaluation. Our Regional office directed us to preserve this information, due to its potential future value (to us or others), but we tried to limit the amount provided to avoid suggesting replacement was part of the recommended plan. {Note that the</p>

[existing] bridge is, indeed, a problem, but that the high frequency of it's being a problem led us to conclude we did not have authority to address it.}

IEPR Panel Backcheck Comment (#24):

Non-Concur. If the existing bridge is not presently or no longer being considered for replacement, all the modeling assuming a new bridge and/or replacement bridge should be revisited. Moreover, it is not presently clear why a new/replacement bridge is discussed in detail if the new/replacement bridge will be designed so as not to impact River hydraulics. The analysis should be redone without the new/replacement bridge, particularly as the hydrology and project designs elements have changed since the previous bridge proposal. In contrast, if this analysis was undertaken to explain the history of the project, such historical background should be noted along with a clear statement that there is no intended replacement of the bridge. With the change to eliminate all consideration of a new Railroad Bridge, please indicate if the modeling results are based on the existing bridge remaining in place and overtopped, or if the bridge will fail during a 100-yr storm. The modeling results from this assumption will have significant impacts on computed backwater elevations, and consequent improved levee heights; potential for a hydraulic jump, resulting deposition in the bridge opening, and consequent negative impacts; and sediment transport through this reach.

Comment #25:
In the GRR/SEIS, p. 6-28, Table 6.7, <i>Comparison of Costs and Equivalent Annual Benefits for Alternative Levee Heights</i>, O&M costs are not included as an annual recurring cost.
Basis for Comment:
It seems O&M costs should be included as annual recurring costs. Cost analysis should include all costs including O&M costs.
Significance: MEDIUM
The cost analysis calculating the O&M costs for the alternative levee heights should be provided regardless of the B/C ratios.
Recommendation for Resolution:
USACE should consider including the O&M costs in Table 6.7 for consistency.
USACE Evaluator Response (#25):
Concur - Adopt: Project costs were recomputed using O&M costs.
IEPR Panel Backcheck Comment (#25):
Concur , since the proposed change will be addressed in the final draft GRR/SEIS.

Comment #26:
In the GRR/SEIS, on pp. 4-28 and 4-30, the timeframe for the construction period is inconsistent.
Basis for Comment:
On p. 4-28, 4.7.3.1 <i>Base Year and Economic Period of Analysis</i> , states “ <i>This construction would begin in October 2012 and be completed in 2026</i> ” totaling a 14-year construction period. On p. 4-30, 4.7.4.2 <i>Costs</i> , it is stated that “[i]nterest during construction was based on a 84-month construction schedule assuming uniform expenditures over the period” totaling a seven-year construction period.
Significance: MEDIUM
Having two different construction periods could result in inaccurate costs.
Recommendation for Resolution:
Modify the GRR/SEIS to reflect the correct number of years for the construction period and revise any sections that would be affected by the change.
USACE Evaluator Response (#26):
Concur. Adopt: Currently, the proposed levees have a 20-year construction schedule. Para. F-17 of the Economics appendix recomputes benefits and costs prior to the base year, at the end of that construction schedule.
IEPR Panel Backcheck Comment (#26):
Concur , since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #27:
The GRR/SEIS should include a discussion of alternatives considered for the reach north of Tiffany Junction.
Basis for Comment:
Although there is a brief generic discussion of local levees, flood warning, flood proofing, etc., there is no discussion of the significance of LFCC with respect to whether this drain (current sole function) is required, or whether it would benefit foundation drainage since it is adjacent to the new levee.
Significance: MEDIUM
It is not clear why the levee improvement was selected over the other options. It may very well be the best option, but this is not shown anywhere in the GRR/SEIS.
Recommendation for Resolution:
Modify the GRR/SEIS to include: <ul style="list-style-type: none"> A. A discussion of specific locations of proposed improvements that turned out to be less effective, B. A discussion of why the LFCC needs to be protected, and any function or utilization beyond acting as a levee toe drain, and C. How the LFCC will benefit drainage of the levee foundation.
USACE Evaluator Response (#27):
<p>Concur - Adopt: Chapter 4 was reorganized based on other review comments and now presents the various alternatives or measures that were considered but screened from detailed evaluation. Table 4.1 was added to give a preview of alternative and rational for screening. Additional detail follows the table in individual sections. A stronger statement is provided as the last sentence for each alternative or measure in section 4.5 to describe the reason it was screening out. This should help make clear “why the levee improvement was selected over the other options”.</p> <p>The statement in the significance field appears to be a separate comment.</p> <p>A. Not Adopt - It is not clear what the commenter means by specific location. The location of both detention dams is given. The communities in which local levees would be implemented were given. Flood proofing would be applied to all appropriate structures in the floodplain. The introduction and chapter 2 provides a description of communities within the floodplain as well as the number of structures in the floodplain. A description and maps of Tiffany basing and the San Marcial RR bridge are provided in Figures 4.1 and 4.2.</p> <p>B. Not Adopt - Section 2.7.2.2 Damageable Property. Clearly states that the LFCC is susceptible to flood damage and has a monetary value. The assumption that “future configuration and operation of the LFCC remain as they are today.” means as a passive drain and part of the</p>

Irrigation system. Section 1.8.1 states “During the course of the study [1999 reevaluation], Reclamation also initiated its study on the feasibility of abandoning the LFCC, which could have reduced the flood risk management benefits for the levee project to half. The Corps then recommended postponing the completion of the GRR until Reclamation decided on the LFCC. In 2002, the Corps received a letter from Reclamation indicating their continued operation of the LFCC...

In 2007, the Record of Decision (ROD) for the Upper Rio Grande Basin Water Operations Review Final EIS (USBR, 2007c) established that Reclamation will continue operating the LFCC as a passive drain with zero diversion from the Rio Grande. At present, the LFCC passively intercepts and conveys shallow groundwater and irrigation return flows downstream to Elephant Butte Reservoir.” The last sentence was revised to read: ...conveys shallow groundwater and irrigation return flows back into downstream portions of the irrigation system and eventually downstream to Elephant Butte Reservoir.”

C. **Adopt** – Enclosed within the geotechnical appendix of the document submission was a levee analysis report from 1995 describing the probable failure point of the spoil bank and an account of some failures of the spoil bank in recent decades. This discussion is brought forward to the main document to better describe what is considered a “failure” of the spoil bank (seep, boil, piping, sloughing). In particular, the account describes sloughing of the riverside bank of the LFCC during flooding as a failure of the foundation. Revised discussions are provided in Sections 1.4.1 Flood History, 3.1.2 Geology and Soils, 3.5.2 Flood Hazard and 3.5.4.1(b) flood risk management.

IEPR Panel Backcheck Comment (#27):

Concur, since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #28:
Probability Analysis must be clarified in the GRR/SEIS.
Basis for Comment:
The discussion is very difficult to follow; an introduction on how the procedure was utilized, including the reference material, and how the computed results were applied would be helpful. The description is in there, but very difficult to follow.
Significance: MEDIUM
It appears that direct equations presented in the guidance documents were applied to compute incremental levee height adjustments, and a composite height of levee raise was determined. However, in the follow-up discussion, it was shown that the final raise value was selected for economic considerations. This should be explained further.
Recommendation for Resolution:
Modify the GRR/SEIS to provide a discussion of why the equations were deemed appropriate, or if it is standard practice to follow the guidance document equations. Address how reliably the composite value represents the individual risk factors and their range and show how the selected value, for economic reasons, was greater than the computed values.
USACE Evaluator Response (#28):
Non-Concur. Not Adopt: EM 1110-2-1619 prescribes a framework for incorporation of quantitative Risk and Uncertainty into the analysis of flood damage reduction studies, which was followed for this study. The Attachment to Appendix F-3 (Hydrology) describes in more detail the basis for the primary descriptor of hydrologic uncertainty adopted for the study (equivalent record length), and summarized in the appendix. For the hydraulics, Chapter 5 of the EM does include procedures that are not all applicable to this study. Beyond that, it is unclear where the concept that “all steps were not considered” arose from. Regarding the “direct equations” and “composite height”, above, Equation (5-6) presents a method of combining differing categories of uncertainty to arrive a composite standard deviation, which was used in this study for its intended purpose. Note that this describes the variation in water surface, not levee height, to model alternative performance. Likewise, some of the composite values computed did not reach the threshold minimum values prescribed by Table 5-2, in which case the minimum values were adopted. The performance of incremental alternative levee heights was modeled using FDA, and the recommended alternative provides the greatest net economic benefits within the context of the modeled uncertainties described.
IEPR Panel Backcheck Comment (#28):
Non-Concur. The main text should include a brief description (one paragraph or so) of the steps followed in the analysis, and which steps were ignored or not applied/relevant to the present

study. Currently it is unclear how probability analysis was applied relative to EM 1110-2-1619 for the project as a whole. If the full description is broken into several sections and placed throughout the document, then the brief summary should reference these more detailed discussions explicitly.

Comment #29:

The GRR/SEIS document should make it clear the extent to which alternative bank and channel stabilization designs that incorporate vegetation were considered, or could be considered under NEPA.

Basis for Comment:

Section 5.1.2. The text on p. 5-3 describes stabilization measures as follows: “A soil cement veneer applied to the existing embankment would prevent scour of the river bank and seepage. Mixing cement with the existing soil forms a stronger, less permeable matrix. The soil cement would be used to accommodate the space limitations because it can be applied to the 1-foot vertical to 1-foot horizontal slope of the existing embankment. Soil cement armoring would begin at the SADD and continue along the west bank of the river for approximately 4,000 feet, where it would transition to the typical earthen levee section used for the remainder of the levee alignment. Self-launching riprap would be placed along the toe of the soil cement armoring and for approximately 600 feet of the earthen levee. The riprap would launch or fall into scour holes as they might develop from channel scouring or incision.” In addition to the alternatives analysis used to determine the appropriate means to address the project purpose, once a preferred alternative is tentatively selected, an analysis of construction alternatives should also be undertaken (and described in the GRR/SEIS). While the proposed design may well turn out to be the best way to achieve the project purpose, the analysis should describe what other designs or methods might be used that are equally valid, superior or inferior, that were rejected. For example, in the example above, rip-rap and soil cement armoring are proposed. Federal planning criteria cited on p. 5-4 include the following “Strive to achieve environmental sustainability. An environment maintained in a healthy, diverse and sustainable condition is necessary to support life.” It is not clear from the text whether “greener” slope stabilization measures (i.e., bioengineering) were considered such as the use of articulated concrete blocks to allow vegetation to be incorporated above the water, which would provide habitat for wildlife.

There is no discussion in the text regarding whether rip-rap and cement are essential within this reach or if alternative measures could be employed to manage erosion and sedimentation more effectively while preserving habitat. Granted, using vegetation may increase the Manning’s roughness coefficient and potentially influence water elevations, but there is no convincing analysis presented as to why it would be infeasible as an alternative.

Later in the document it is stated “The Corps’ Engineer Technical Letter 1110-2-571 (10 April 2009) requires that no ‘woody’ vegetation be allowed to grow on the levee or within 15 feet of the riverward and landside toes of the levee. In this case, ‘woody’ vegetation is considered tree or shrub plants with trunk diameter greater than ½ inch. During construction, existing vegetation would be removed adjacent to the riverward and landside toes by root plowing or clearing and grubbing to create a vegetation management zone.” The question raised is whether the text complies with NEPA. Granted, the Engineering Technical letter may reflect USACE policy; from a technical perspective the reason why vegetation is not allowed to grow at the base of the levee is not fully explained or justified on the basis of past studies/results. Are there “greener” approaches that could potentially be safely accommodated into the design but were

apparently not discussed? For example, could concrete blocks be used that allow some vegetation to grow between them and, therefore, address both stabilization and habitat issues? While the IEPR panel is not focused on policy, the concern here is that the text is both NEPA-compliant and represents a scientifically valid and supportable look at all alternatives.

The USACE memorandum in GRR/SEIS indicates that vegetation policy on levees should also consider other environmental factors and statutes, such as the Endangered Species Act, in choosing a final design (http://www.water.ca.gov/floodsafe/leveeveg/levee_documents/2011-129_Memo_USACE-SWIF.pdf). Reference specifically para. 3b, and item 10, which refer collectively to the District's ability to obtain a vegetation variance in order to comply with the Endangered Species Act, for example.

It is not clear from the text whether alternative approaches were considered, and if so, why they were rejected. The USACE has a vegetation variance policy (that is currently being updated) that might allow vegetation to be incorporated into sections of the levee design to help minimize loss of habitat and mitigate for potential impacts to Southwest willow flycatchers and other riparian species.

Significance: MEDIUM

Additional detail is required to determine if the document is NEPA-compliant and addresses impacts to the degree practicable.

Recommendation for Resolution:

Further discussion seems warranted within the USACE regarding the extent to which vegetation can be incorporated further in the design in order to increase habitat quantity and quality along the 43-mile proposed levee.

USACE Evaluator Response (#29):

Concur.

Adopt Later: Regarding soil cement erosion protection Section 5.1.2: The design for this feature has changed slightly to include soil cement throughout its vertical extent (installed in an ascending series of 1-foot lifts. This embankment is located on the outside bank of a large bend of the channel. The text will be revised to explain that the high velocities expected during the design flood — 17- 20 feet per second — preclude the use of vegetation for bank stabilization in this area.

Rip rap is proposed to be used to protect the levee slope and toe in selected downstream areas. The use of alternative materials (including articulated block) is being evaluated pursuant to the recommendations of a Value Engineering study.

Regarding vegetation along the levee slope and toes: The text will be revised to explain that the penetration of large (> 0.5”) roots into the levee can facilitate increased seepage and saturation of the structure during floods. The current policy is based on nationwide experience, and local and regional studies of specific problems are ongoing. These results, and other pertinent information, will be considered during the phased design and construction of the project over the next 20 years.

IEPR Panel Backcheck Comment (#29):

Concur, provided additional information will be included in Phase 2.

Comment #30:
GRR/SEIS Section 6.8 (Socioeconomics) should address potential economic benefits generated by the project to the community.
Basis for Comment:
It seems unusual that the GRR/SEIS does not mention potential jobs growth (at least in short-term construction jobs) and other local economic benefits that would result from such a large project. Constructing 43 miles of levee over a 10–14-year period would almost certainly provide economic benefits to the local economy, which in addition to jobs could include local services such as hotels/housing, restaurants, mechanized equipment rental, landscaping, and other goods and services.
Significance: MEDIUM
USACE is missing an opportunity to demonstrate positive project impacts, and this analysis is required by internal guidance. The RED section in Appendix F-10 might also include more discussion of economic impacts during construction.
Recommendation for Resolution:
The decision regarding whether to proceed with the proposed project is dependent on whether the project is deemed in the public interest. The economic feasibility of the project itself has been focused on in detail. However, the project has the potential to create local economic benefits that do not appear to be addressed in Section 6.8. The District should review the <i>Proposed National Objectives, Principles and Standards for Water and Related Resources Implementation Studies</i> document dated December 3, 2009, which describes how economic impacts to the regional economy should be addressed: “ <i>b. Regional Economic Subcategory. This subcategory includes the changes in the distribution of regional monetary effects that result from each alternative shall be displayed when they are significant to local, state, and regional decision making, or needed to address other concerns of the public. A region may be defined as needed to address these concerns. Regional effects include the National effects that accrue within the region, plus transfers of income into or out of the region relative to the rest of the Nation. The monetary effects of an alternative not occurring within the defined region shall be displayed in a “Rest of Nation” category. Regional changes include National effects, income transfers, and employment effects.</i> ”
USACE Evaluator Response (#30):
Concur. Adopt: The current state of USACE guidance on RED impacts is, in effect, “show RED impacts in your analysis, consistent with the Principles and Guidelines.” The text was revised to include discussions contained within Para. F-18 and F-11 of the Economics appendix to demonstrate the impacts to local income and employment by large scale, long duration Federal infrastructure investments as well as the importance of protecting the Low Flow Conveyance Channel to the

region. A bulk of the benefits produced by the channel were considered RED benefits, in fact, and not claimed in the NED benefits analysis. The section was revised to read:

“The RED account is intended to illustrate the effects that the proposed plans would have on regional economic activity, specifically regional income and regional employment. This account is typically used to capture the regional impacts of a large capital infusion of project implementation dollars on income and employment throughout the study area through the use of income and employment multipliers. A large infrastructure project such as this one in the Middle Rio Grande Valley will have a positive impact on local income and employment. The alternatives would have a similar impact of approximately \$165 Million over a period of 168 months that would have a positive benefit to the local economy.

Benefits from the Federal project would include the reduction of flood damage and interruption of service provided by the LFFCC. The LFCC functions as a riverside drain, and provides valley drainage, irrigation return flows and shallow groundwater interception, and water for use by Bosque Del Apache NWR and MRGCD. Bureau of Reclamation estimates that water is diverted from the LFCC, used, and return flows captured 4 times between the San Acacia diversion dam and the downstream end of the LFCC. The Fish and Wildlife Service also recognizes the LFCC as providing water to habitat critical to the Southwest Willow Flycatcher (an endangered species). Those functions have value to the region and the environment.

Without the Low Flow Conveyance channel, life in the study area would be different. According to the Bureau of Reclamation, “Land use practices and their economic values for the agricultural community and BDANWR would be diminished without the LFCC drainage facility. There would be the potential for increased groundwater levels due to surface water irrigation of lands and increased alkalinity in the soils due to the groundwater rising and fluctuations near the root zones. These alkalinity problems due to lack of valley drainage would also impact fish and wildlife, vegetation, wetlands, and endangered species functions on the BDANWR.” Absent the LFCC, stormwater and irrigation runoff has no means to return to the perched Rio Grande, meaning the State of New Mexico will have a harder time making water deliveries to Texas and Mexico per the Rio Grande Compact.”

IEPR Panel Backcheck Comment (#30):

Concur, since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #31:

Potential contaminant issues associated with the proposed project have not been adequately addressed in the GRR/SEIS.

Basis for Comment:

There are numerous instances where the text describes earthmoving activities, placement of fill, modification of the spoil banks, and other activities that could release contaminants to the environment if present. At present, there is no discussion in the GRR/SEIS regarding proposed testing, or how USACE will address these issues if encountered to ensure that air or water quality are not impacted by construction activities or that placement disposal requirements will be met.

For example, the document should address whether earthmoving activities involved with removing sections of the spoil banks in Bosque del Apache National Wildlife Refuge would require testing and analysis to determine if the fill material is contaminated, and if so, what the proper handling and disposal methods would be.

Section 3.3, p. 3-8, states “*Current HTRW contamination within the study area is limited to domestic trash and litter. Due to increased awareness and protection of the Middle Rio Grande corridor, it is anticipated HTRW contamination in the future would be limited to illegally dumped materials and litter.*” This section does not address potential sediment contamination in the river referenced in prior documents coming in from upstream within the watershed (e.g., pesticides, nutrients, TSS, radionuclides, and metals from agricultural and other runoff). These parameters are not addressed under Section 3.1.4, water quality either.

Similar potential hazardous toxic radioactive waste (HTRW) issues that are not addressed include:

- Subsection 5.1.10: “*The random fill necessary for the construction of the levee would come from the excavation of the existing spoil bank, which the proposed levee is replacing, and from the east side channel lowering just downstream of the SADD.*”
- GRR/SEIS, p. 6-8, states “*Considering only those areas where levee construction would be below the OHWM, approximately 9.1 acres of the current open floodway area would be filled by earthen levee material by Alternatives A+4ft or K+4ft; however, about 12.3 acres of floodway area would be gained due to removal of the old spoil bank.*” Again, it should be specified whether and how the fill material will be tested prior to placement to ensure water quality criteria are met.

Significance: MEDIUM

It is important to understand in advance for costing, logistics planning/feasibility, and evaluation of construction alternatives whether any material is contaminated. This could present an impacts issue as well should contaminated material come into contact with aquatic resources.

Recommendation for Resolution:
Provide a description of potential testing protocols and assurance that the material will not leach contaminants when mobilized.
USACE Evaluator Response (#31):
<p>Concur.</p> <p>Adopt: The USACE has performed due diligence per regulation and ASTM standard for the GRR/SEIS II. As stated in Sections 23, 3.2 and 6.3 database searches and site surveys did not identify any known or suspected HTRW concerns in the footprint of the proposed project. (Tiffany Basin and the San Marcial Railroad Bridge are outside of the proposed area of construction.) As stated in Subsection 5.1.10: “The random fill necessary for the construction of the levee would come from the excavation of the existing spoil bank”. The spoil bank was the focus of Phase I surveys to date. USACE regulation requires additional phase 1 site assessments be conducted within 6 months prior to new construction. Therefore timely phase I assessments will be conducted on a site specific basis for each phased construction effort during the projected 20-year construction period. That is the projected construction would occur at a rate of 3-4 miles per year and would require a phase 1 assessment for the construction reach for that year. The findings during those investigations will determine if additional testing is appropriate. Standard language in all USACE construction contracts states the if any stained soil, barrels or containers, etc are found during excavation or construction that construction will halt, findings reported and assessment be completed prior to resuming work.</p> <p>Further, since the constructed levee with erosion control is less likely to erode or have a catastrophic failure over the existing spoil bank, the proposed project will have a decreased probability of introducing unknown contaminants into the waterways.</p>
IEPR Panel Backcheck Comment (#31):
Concur , provided a figure of the sites depicting the results of the Phase 1 assessment will be included in Phase 2.

Comment #32:

The GRR/SEIS should contain more figures to support statements and conclusions made in the text.

Basis for Comment:

In general, the existing conditions section is well-written and provides a sufficiently comprehensive basis for comparison with project alternatives. However, certain sections of the existing conditions and impacts sections would benefit from the inclusion of figures indicating the location of features referenced in the text.

- A. This applies to Section 3 on HTRW, Section 2.4.1 on Riparian Plant Communities (a table is provided), Subsection 2.4.4.1 critical habitat for the silvery minnow, Subsection 2.4.4.2 critical habitat for the Southwestern willow flycatcher.
- B. Section 2.5 states that *“by 2005, approximately 210 archeological sites had been documented in the immediate vicinity of the project area, but that with the exception of the spoil bank and the LFCC, no sites or features were identified within the proposed levee replacement zone (in the 1997 study).”* Again, a figure would be helpful for the GRR/SEIS reader to verify this, even though a report was previously produced in 1997. Another example: text on p. 3-9 states *“a series of habitat restoration projects have been implemented in the middle Rio Grande.”* It would be useful to visualize where these have been proposed in relation to the proposed project.
- C. Section 3.4 references that 40 cultural sites would be impacted by similar flood events to the 1929 and 1937 events. Again, a figure would be helpful. A figure in Section 4.8 supporting this text would be helpful: *“Two locations on the west bank within the Bosque del Apache Unit and north of Tiffany Basin were presently not in agricultural production or irrigated. These locations would be located within the 43 mile levee reach in Plan A and would represent a departure from the alignment evaluated in that alternative.”*
- D. The text on p. 2-24 states *“In 2010, 27 of the flycatcher territories in this reach were located on the west bank of the river, adjacent to the alignment of the current spoil bank and proposed engineered levee.”* A figure would be very helpful here or in the impacts section showing the location of the area (not specific nests) to the proposed levee construction.
- E. *“Vegetation mapping produced by Parametrix (2008) has been used to quantitatively characterize the vegetation composition and is the most complete digitized coverage available to date.”* Again, no supporting figure has been provided.
- F. Section 3.5.4 Land Use and Classification (under Future No-Action conditions). This section would benefit from a zoning map if one exists of the area, to support the conclusion of no anticipated land use changes.

Many of these figures would be easy and cost-effective to produce and would greatly aid in understanding the potential project impacts (or lack thereof). These can easily be 8.5-in x 11-in figures and incorporated into the body of the text.

Significance: MEDIUM

The clarity of the GRR/SEIS would be much greater with figures and enable the reader to verify the conclusions and other statements made within the text. This is important to do if the document is going out to public comment.

Recommendation for Resolution:

It is recommended that the District add the suggested figures to allow the reader to corroborate findings of the GRR/SEIS.

USACE Evaluator Response (#32):

Concur: With a primary affected area that is 1 to 2 miles wide and 43 miles long, depicting resources throughout the study usually entail 4 or more 11x17” sheets. Where possible links or references to existing supporting information is provided to reduce the size of the existing document per NEPA.

A. **Adopt:** HTRW concerns have been described in the text using landmarks depicted on project maps. Additional maps would not provide significant additional information. Detailed Vegetation mapping would require 7 or 8 plates for proper resolution. The mapping system is esoteric to the public (but is intimately known and accessible by local biologists). Critical habitat for both species encompasses nearly the entire floodway for 50 miles with only minor exceptions (e.g., NWRs). The discussion of minnow habitat will be revised to concisely describe this, and provide a USFWS internet source for flycatcher critical habitat. No additional maps will be added for the reasons stated above.

B. **Adopt:** For recent ecosystem restoration projects, we’ll provide a link to an easily accessible summary report on these activities.

Not Adopt for the 1st sentence in both Parts B and C of Comment No. 32. Per the Archaeological Resources Protection Act of 1979, public disclosure of archaeological site locations is prohibited (16 U.S.C. 470hh; 36 CFR 296.18); therefore, no maps showing archaeological site locations will be provided in this public document. Professional archaeologists and Native American tribes are aware that site information can be made available on a need-to know basis

C. **Adopt:** A map of the alternative levee-setback areas is provided for section 4.8.

D. **Adopt:** A graphic to display the distribution of breeding flycatchers over the past 2 seasons is provided in section 2.4.4.2.

E. **Not Adopt:** Detailed Vegetation mapping would require 7 or 8 plates for proper resolution. The mapping system is esoteric to the public (but is intimately known and accessible by local biologists). The text of the report has been revised to more clearly describe affected vegetation in terms of general types.

F. **Not Adopt** - The proposed structures occupy fee land or easements that are dedicated to its use for flood control purposes and would replace the existing inferior structure that is used for the same purpose. The affected area lies within Federal or local governments lands and is not

zoned for municipal purposes.

IEPR Panel Backcheck Comment (#32):

Concur, since the proposed changes (items C and D) will be addressed in the final draft GRR/SEIS.

Comment #33:
Identify the methodology used to identify wetlands in the study area.
Basis for Comment:
The text in Section 2.2.4 indicates that “ <i>No wetlands, as defined in Section 404(b)(1) of the Clean Water Act, have been identified within the affected area for the final array of levee construction alternatives.</i> ” The text should identify and defend as appropriate the methodology used to identify whether wetlands were present (e.g., aerial photographic review, elevational comparison, site reconnaissance, or detailed wetland delineation methodology consistent with the Federal manual).
Significance: MEDIUM
At present, the statement that there are no wetlands cannot be verified independently on the basis of the information provided by USACE.
Recommendation for Resolution:
Include a description of the methodology used to conclude there are no jurisdictional wetlands affected by the project.
USACE Evaluator Response (#33):
Concur. Adopt: The text is revised to explain that the determination was initially based on aerial imagery, and vegetation and soil type mapping, and was confirmed during surveys of all areas potentially affected by construction activities. Riparian areas in the arid southwestern US often lack the hydric soil conditions specified in national and regional wetland delineation criteria.
IEPR Panel Backcheck Comment (#33):
Concur , since the proposed change will be addressed in the final draft GRR/SEIS.

Comment #34:
Provide additional detail on Environmental Justice concerns pertinent to the No-Action condition.
Basis for Comment:
<p>Regarding Environmental Justice, updated poverty data from 2009 are now available at the U.S. Census Bureau website. The GRR/SEIS text is well written but appears to stop short of a conclusion regarding whether the community would suffer disproportionate effects from flooding events. This point could be fleshed out further: According to U.S. Census Bureau data, 31.5% of the population of Socorro, New Mexico, lives below the Federal poverty threshold of \$21,954 (based on a family of four), and 54% of the individuals living below the poverty threshold did not work. This example suggests that individuals below the poverty line would pay a disproportionate share of the impact from a major flooding event without the project because flood insurance places an additional burden on their already limited income.</p> <p>Further, U.S. Census Bureau data suggest that having to purchase flood insurance can put strains on families living in Socorro who may be above the poverty threshold. For a family in Socorro making the 2009 median household income of \$28,942, after-tax income in New Mexico would be \$20,795. The Federal flood insurance premium for a residential building and contents for a structure on California Street in Socorro (as an example) would be as high as \$1,700 and would represent approximately 8% of that family's after-tax income.</p>
Significance: MEDIUM
There is insufficient detail regarding Environmental Justice; in this case, the analysis supports the project.
Recommendation for Resolution:
Suggest providing similar detailed analysis to the Comments above if available as part of the justification for the project.
USACE Evaluator Response (#34):
<p>Concur.</p> <p>Adopt: Some discussion of the impact of the Federal project relative to the FEMA NFIP program and flood insurance was removed based on a comment from USACE Headquarters and the Office of Water Project Review to de-emphasize any implication that this project was designed to accommodate the NFIP program. Impacts to the community relative to the NFIP program nonetheless may be realized. Additional text was brought forward from Section 2.7 to section 6.8.5 to state: "Implementation of the Federal project would reduce the risk of flooding and associated property and agricultural losses to households residing in the west bank floodplain. As discussed in Section 2.7, 30.4 percent of the residents in Socorro County were classified as living in poverty, a higher percentage than in New Mexico (17.9 percent) or in the US (13 percent) (U.S. Census Bureau, 2009a). The financial losses from flooding, or the annual cost of insurance to offset the losses, present a significant financial burden especially to the low</p>

income households. For those residents living in poverty, the loss would be catastrophic. In the case of the Rio Grande floodplain in Socorro County, NM, individuals below the poverty line would pay a disproportionate share of the impact from a major flooding event without the project because flood insurance or losses due to flooding place an additional burden on their already limited income.”

IEPR Panel Backcheck Comment (#34):

Concur, since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #35:
Provide additional detail to substantiate Future No-Action projections in Section 3.3.1 and 3.3.2.
Basis for Comment:
<p>Section 3.3.1 on p. 3-8 lacks sufficient detail in support of the broad statements <i>“In the future without-project scenario, the current status of the riparian ecosystem would continue to degrade, including continued fragmentation of remaining habitat, lack of overbank flooding necessary for regeneration of native vegetation, and nonnative vegetation replacing native vegetation.”</i> Specifically, the document would benefit from discussion of: What are the specific sources of continued fragmentation of habitat (development into smaller parcel sizes? If so, how is this occurring if demography is flat over the next decade? How far out is USACE projecting, 50 years?), and, What specific factors would encourage non-native vegetation to continue replacing native vegetation? If, for example, cottonwood trees will continue to mature, that would benefit some wildlife (and presumably plant) species at the expense of others. Also, the document could address to what extent the spread of non-native vegetation be offset by existing management programs. Are these programs currently working to keep the spread in check throughout the entire study area reach or are they a “drop in the bucket” focused on specific areas such as the Bosque del Apache refuge?</p> <p>Section 3.3.2 on p. 3-8 could also benefit from more detail in support of the conclusions regarding trends, and sounds a bit generic as written: <i>“In the future without-project scenario, the current status of the aquatic ecosystem would continue to degrade, including continued fragmentation of remaining habitat, aggradation of the floodplain coupled with increasing depths to groundwater, and narrowing of river channel from the effects of water regulation and restriction of historical river avulsion patterns due to constrains on the channel, resulting in the loss of warmwater aquatic habitat and wetlands.”</i> Specifically, the document should address whether sedimentation in the river would be greater in the future under No-Action conditions, simply as a result of the more extreme storm events referenced in the climatic change section that would increase the steepness of the hydrograph and cause greater erosion. This, in turn, would be expected to increase the amount of sediment plug events. The text should then address the specific impacts—Southwestern willow flycatchers seem to benefit because they can colonize the young willow growth that may generate in these areas before they are cleaned out. Silvery minnows, in contrast, would not benefit from those trends without considerable intervention and maintenance at Government expense. Also, the effect of climatic change would tend to exacerbate channel desiccation mentioned under Subsection 3.3.4.1. While this would probably be detrimental to silvery minnows, the discussion should be broadened to the aquatic community as a whole.</p>
Significance: MEDIUM
More detail is necessary to enable an informed comparison of project impacts with Future No-Action conditions.

Recommendation for Resolution:
Add the additional detail to the text as a basis to allow detailed comparison with the Future Action alternative.
USACE Evaluator Response (#35):
Concur. Adopt Later: Section 3.3.1: You make several good points about improving this text to benefit the reader. We will revise the text to clarify the general statements, and will attempt to quantify some potential effects (while avoiding extrapolation where sufficient information is lacking).
IEPR Panel Backcheck Comment (#35):
Concur.

Comment #36:
Provide weight of the evidence conclusion regarding projected silvery minnow populations in the future without the project.
Basis for Comment:
<p>Subsection 3.3.4.1 provides a sufficiently detailed summary of No-Action conditions pertaining to the silvery minnow from the perspective of factors adversely impacting this species versus management initiatives designed to sustain its populations. While predicting the future is difficult, the document should reach some conclusion regarding the most likely scenario for the future regarding this species. (For example, under existing conditions, it sounds as if a certain amount of the population may wash downstream every year into Elephant Butte Reservoir and die). The text should address the question head on: Are populations likely to continue to decline if current trends continue, without the project? Or at a minimum, are they likely to continue to decline without significant Government intervention and expenditure of public funds? NEPA does not require certainty, and Federal management decisions are made routinely on the basis of incomplete information. As such, the value of the current text is limited by not weighing the evidence to reach some conclusion.</p> <p>In addition, while it is appreciated that the Future No Action section attempts to address issues associated with climate change, an attempt should be made to connect future trends with silvery minnow habitat and population changes. If snowmelt is earlier in the year than previously, the document should attempt to address the implications on water levels in the Rio Grande and supporting tributaries, particularly in relation to late summer months, impacts on juvenile recruitment, and movement downstream.</p>
Significance: MEDIUM
Data and information have been provided but the document needs to take a stance and indicate what impacts would occur relative to Future No-Action conditions.
Recommendation for Resolution:
Provide the suggested conclusion in the text.
USACE Evaluator Response (#36):
<p>Concur.</p> <p>Adopt: The available silvery minnow habitat and population monitoring literature has been condensed to the issues relevant to the project. USACE participates in the Middle Rio Grande Endangered Species Collaborative Program (CP) along with the Fish and Wildlife Service. The CP monitoring reports indicate the silvery minnow population has resilience to highly variable flow volumes during the current drought. The CP sponsored population viability analysis (PVA) model is nearing completion. Continued government involvement will likely contribute toward maintaining a viable silvery minnow population during the drought. The population will likely continue to vary over several orders of magnitude with a low risk of extinction.</p>

The range of conclusions based on limited analysis precludes making statements about the species future. There is a significant gap between climate models and species/habitat models. The appropriate venue for data analysis and synthesis for projecting into the future is through the CP, and not this document. The minimal effects of this project on silvery minnows are unlikely to change the viability of the population.

Substantial revisions to Chapter 6 have been made to provide improved biological information.

IEPR Panel Backcheck Comment (#36):

Concur, since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #37:
Ecosystem restoration goals are introduced generically up front but not addressed in the text of the impacts section. There is no discussion of how impacts to habitat quality will be addressed by the proposed project.
Basis for Comment:
P. 4-4 states <i>“Ecosystem restoration is also one of the primary missions of the Corps Civil Works Program. The Corps’ objective is to contribute to National Ecosystem Restoration (NER) through increasing the net quality and/or quantity of desired ecosystem resources. NER measurements are based upon changes in ecological resource quality as a function of improvement in habitat quality or quantity, and are expressed quantitatively in physical units or indexes (not monetary units).”</i> While the appendices of the 1992 GRR/SEIS mention habitat valuation used to evaluate the impacts of different project alternatives, no mention of the methods, results, or subsequent valuation is provided in this document to support selection of the proposed alternative.
Significance: MEDIUM
Ecosystem restoration is mentioned up-front with no detail regarding its role in the project or how effects will be mitigated based on habitat quality.
Recommendation for Resolution:
Address whether ecosystem restoration should be included in project objectives, or delete the reference. In either case, mitigation plans/alternatives should be discussed in greater detail in the document.
USACE Evaluator Response (#37):
Concur. Adopt: The planning with reference to ecosystem restoration has been removed. A detailed (although preliminary) mitigation plan has been added to the revised report.
IEPR Panel Backcheck Comment (#37):
Concur , since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #38:
Subsection 4.7.6.3 provides inadequate detail in support of the findings presented.
Basis for Comment:
Subsection 4.7.6.3 entitled Ecological Contributions states “ <i>Ecological improvements that would be generated by the proposed alternatives include additional floodplain habitat within the floodway. Since the footprint of the proposed levee feature has a smaller total footprint than the existing spoil bank, additional floodplain may be provided from implementation of a Federal project.</i> ” Note that “floodplain” is not an ecological term and does not in itself speak to the habitat that would be created. Without an assessment of the frequency or depth of inundation, it is difficult to envision whether this habitat would succeed into riparian conditions or remain upland habitat degraded by occasional rapid erosive forces from severe flood events. More detailed clarification is necessary if the reader is to be convinced that this is an ecological contribution.
Significance: MEDIUM
The project benefits and impacts cannot be fully understood without further clarification.
Recommendation for Resolution:
Subsection 4.7.6.3 should be revised to describe the specific habitat to be created by the proposed project design so that the conclusion that it will have an ecological contribution can be verified.
USACE Evaluator Response (#38):
Concur. Adopt: A brief description of the gained acres, vegetation type, & water regime; or a reference here to the section in Chapter 6 describing the same will be added.
IEPR Panel Backcheck Comment (#38):
Concur.

Comment #39:
A variety of potential damage costs have been excluded from Appendix F-10, which suggests the economic analysis may be conservative. Critical related information about the nature of flood events has also not been provided.
Basis for Comment:
Certain damages and costs may be understated in the quantitative analysis. Potential loss of life, loss of pastured animals, water contamination, and damages to some agricultural equipment and infrastructure may be under-counted. For example, the GRR/SEIS notes “ <i>Within the Rio Grande floodplain, there is irrigated farming and livestock pasturage</i> ” (p. 2-32) but no livestock losses are counted. Also, existing O&M costs and flood-fighting costs may be reduced by the proposed levee.
Significance: LOW
It seems unlikely that these damage costs would have much effect on the economic justification.
Recommendation for Resolution:
Discuss what a flood would be like including water velocity, notification issues, ability to remove agricultural equipment and animals, and people. Consider working with the USBR to identify a share of the \$2 million LFCC annual O&M and flood-fighting costs that would be avoided with the new levee. Use the current Federal discount rate.
USACE Evaluator Response (#39):
Concur. Not Adopt: USACE did ask the Bureau of Reclamation the nature of their flood fighting efforts and any savings that could be realized with the construction of the proposed levee. The Bureau could not provide that information. Please see Para. F-11 of the Economics appendix. Para. F-18 describes “Other Social Effects” and suggests that thunderstorm-based events would have no warning time. Velocities are not expected to dislodge vehicles, and livestock wasn’t encountered in the floodplain during the economic inventory.
IEPR Panel Backcheck Comment (#39):
Concur.

Comment #40:
The analysis regarding the probability of failure for the proposed levee is not well-supported.
Basis for Comment:
The discussion regarding the probability of failure for the proposed levee does not include pertinent or adequate documentation of the results of the hydrologic, hydraulic, and/or geotechnical analyses. There is no explanation of how the results of these analyses are input into the HEC-FDA model or the economic analysis.
Significance: LOW
Needs to be discussed but no additional analysis is suggested.
Recommendation for Resolution:
Summarize hydrologic, hydraulic, and geotechnical analyses within Appendix F-10; provide a discussion of failure probabilities for the with-project levee alternatives in the text.
USACE Evaluator Response (#40):
<p>Non-Concur.</p> <p>Not Adopt: Para. F-19 of the Economics appendix describes the project performance analysis and findings. Essentially, the analysis determines whether the array of storms or a specific recurrence interval event produces a flood stage greater than the top of the proposed levee. Paragraphs F-08 and F-11 of the Economics appendix assert that the existing spoil bank levee has no capacity to withstand flood flows at any stage, and was removed from the economic analysis of damages and benefits.</p> <p>See response to comment 2. HEC has advised the PDT that recomputing EAD from specific event information doesn't capture all the factors going into EAD, such as the confidence intervals of the data going INTO the model. If we could capture and successfully replicate all the factors outside of the certified model, we wouldn't need the HEC-FDA model.</p>
IEPR Panel Backcheck Comment (#40):
Concur , except as noted under Comment #2 above.

Comment #41:
The panel is unable to determine if the economic analysis includes an appropriate amount of sediment clean-up costs.
Basis for Comment:
<p>In Appendix F-10, it is not clear from the discussion provided at the end of Section F-03 and the explanation of emergency costs on p. 24. Are sediment clean-up costs included in emergency costs?</p> <p>The discussion of urban, agricultural, and refuge damages does not include costs associated with sediment following flood events. These damages could be significant for agricultural and refuge lands.</p>
Significance: LOW
<p>Clean-up costs associated with sediment could be significant for agricultural and refuge lands. However, it seems unlikely that additional sediment costs could have much effect on the economic justification.</p>
Recommendation for Resolution:
<p>Provide estimates of urban, refuge, and agricultural acreage flooded. Discuss the history of sediment damages from floods in this region. Discuss how flood events would deposit sediments. Discuss how the methodology captures sediment clean-up and land re-grading costs, or not. If possible, include explicit accounting for sediment clean-up costs. At a minimum, note that some benefits may be conservative because of this exclusion.</p>
USACE Evaluator Response (#41):
<p>Concur.</p> <p>Adopt Later: A more detailed discussion of sediment deposition from flooding will be added. The discussion will include a statement that estimated clean-up costs were derived from similar flood events in SE NM. Sediment clean up costs, however, are unavailable in the study area. The “Emergency Costs” figure was based on flooding in Carlsbad, NM, and included evacuation, reoccupation, disaster relief, cleanup and debris removal, and other similar expenses.</p>
IEPR Panel Backcheck Comment (#41):
<p>Concur, based on USACE stating that sediment cleanup costs are low and will not affect the investment decision.</p>

Comment #42:
Provide more discussion in Appendix F-10 on how Cochiti can be operated during a flood.
Basis for Comment:
The addition of Cochiti has provided some ability to control flows downstream of the confluence of Rio Puerco and Rio Salado. To what extent can Cochiti be used to reduce damages from a downstream flood event?
Significance: LOW
This would help the reader understand event damages; no change to the economic justification is expected.
Recommendation for Resolution:
Explain how modeled operations at Cochiti influence the economic analysis.
USACE Evaluator Response (#42):
<p>Concur - Adopt: The following section was added to Appendix F-10 in section F-11 3. D.</p> <p>d. Alternative means to flood fight (operate Cochiti)</p> <p>Aside from flood fighting as flows threaten the spoil bank levee and the LFCC behind it, there are few other options available to the Bureau of Reclamation to mitigate the damages. Cochiti dam and reservoir is roughly 120 miles upstream of the study area and changing operations at Cochiti does not have an impact in the study area for three days. Galisteo and Jemez dams are also upstream, but do not contribute materially to flows within the study area. The hydrology for the region indicates that events in unregulated watersheds downstream of Cochiti dam generate the most severe flows in the study hydrology. However, spring snowmelt runoff floods provide longer durations which further threatens to the fragile spoil bank levees. At the downstream end of the study area is the San Marcial railroad bridge, which is described extensively elsewhere as facing both a flood threat and a sediment accumulation threat. That bridge represents a choke point for operating Cochiti Dam releases, as the Federal government cannot cause flood damage to the structure through its operations. When the Bureau of Reclamation manages sediment accumulations in the Rio Grande, one of the results is maintained channel flows under the bridge.</p>
IEPR Panel Backcheck Comment (#42):
Concur.

Comment #43:
As presently written, the GRR/SEIS does not provide a clear explanation of Alternatives B–J and the rationale for their elimination from further consideration.
Basis for Comment:
Although these alternatives are described in Appendix F-10, a brief explanation of what Alternatives B–J were and why they were eliminated for further consideration should be included in the discussion of alternatives (Section 4.5).
Significance: LOW
The GRR/SEIS should contain information on the Alternatives to provide a better understanding of the project.
Recommendation for Resolution:
Revise the GRR/SEIS, Section 4.5, and Table 4.1 to include a description of eliminated Alternatives B–J.
USACE Evaluator Response (#43):
Non-Concur. Not Adopt: Chapter 4 was reorganized in response to another review comment to make the screening and formulation story simpler. This revision much improved the complicated story of preliminary and subsequent screening as well as optimization of plans of interest. The discussion of recombined FRM measures resulting in A-Q was removed and instead the individual measures were described and rational for removal from consideration provided in Section 4.5. Table 4.1 was added to preview this discussion.
IEPR Panel Backcheck Comment (#43):
Concur , since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #44:
In the GRR/SEIS, p. 4-28, para. 4.7.3.1, <i>Base Year and Economic Period of Analysis</i>, the determination of when the base year conditions begin is not clear.
Basis for Comment:
Para. 4.7.3.1 states that the “ <i>San Acacia to Bosque del Apache Unit Project, base year conditions begin immediately after construction, when operation begins.</i> ” Then it states “ <i>base year of 2012 was chosen on the assumption that study completion, and that the design would be completed in 2012.</i> ”
Significance: LOW
The current statements regarding the base year conditions appear to be contradictory.
Recommendation for Resolution:
Modify the GRR/SEIS to provide for a consistent definition of when the base year condition begins.
USACE Evaluator Response (#44):
Concur. Adopt: Based upon the new 20-year construction period for the proposed levee, the base year was moved to the end of that construction period. Benefits and costs during construction were computed, and presented in Para. F-17 of the Economics appendix.
IEPR Panel Backcheck Comment (#44):
Concur , since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #45:
There are some discrepancies between the content of Table 4.9 and its footnotes.
Basis for Comment:
The caption of the Table shows a (5-1/8% interest rate) whereas Note 4 shows a 4.375% interest rate. Note 2 states that the “ <i>Total First Costs do not include contingency, construction management/SA, and land, easements, rights-of-way, relocation, and disposal areas (LERRDs). These will be incorporated in subsequent submittal,</i> ” however the Total First Costs of \$161,577 includes these areas.
Significance: LOW
The current text in the table and footnotes appears contradictory.
Recommendation for Resolution:
Modify the GRR/SEIS to reflect the accurate interest rate and update Note 2 to identify whether or not the costs are included in Total First Costs.
USACE Evaluator Response (#45):
Concur - Adopt: Typographical errors have been corrected.
IEPR Panel Backcheck Comment (#45):
Concur, since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #46:
On p. 5-16, para. 5.1.14, Line 1, an incorrect reference is given. Also, at Line 6, indicate that July–April are the months of the year when the low flows can be expected.
Basis for Comment:
Para. 5.1.14 states “ <i>The excavation of the east bank described in 5.1.5 to reduce high velocity flows downstream ...</i> ” The correct reference should be para. 5.1.10, Fill, Borrow, and Disposal Requirements. The construction logistics on this project are important, therefore the months of the year (July–April?) when low flows can be expected should be cited.
Significance: LOW
Logistics are impacted.
Recommendation for Resolution:
Update the GRR/SEIS to reflect the correct reference and identify the months of the year when the low flows can be expected.
USACE Evaluator Response (#46):
Concur. Adopt: The section was revised to provide the correct reference as Section 5.1.2 Levee Design. This section describes the reason for and effect of the east bank excavation. Since spring runoff occurs in May and June the predictable low flow condition in the Rio Grande is in fact July through April. The reference in this section pertains to maintaining a wet river channel by not interrupting the low flows. For the purposes of installing and using the construction crossing from the West to East Bank the ideal time to perform this work is during the low-flow period for this reach of the Rio Grande. There is some probability the crossing could be exceeded by a large, short duration, monsoonal-type event probably between mid-July to October.
IEPR Panel Backcheck Comment (#46):
Concur , since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #47:
P. 4-34, Authorized Project/Employment. Once the project is constructed, the GRR/SEIS should show a decrease in employment for O&M of the levee.
Basis for Comment:
Point of information.
Significance: LOW
Although not discussed in the GRR/SEIS, this may impact the results of economic analysis.
Recommendation for Resolution:
Make appropriate changes to the GRR/SEIS.
USACE Evaluator Response (#47):
Concur. Not Adopt: It makes sense that the proposed levee would alter the Bureau of Reclamation's activities, but the Bureau was unable to provide any quantifiable benefits through OMR&R changes relative to the existing levee. A discussion of the Bureau of Reclamation's activities pre- and post-project is contained within Para. F-11 of the Economics appendix.
IEPR Panel Backcheck Comment (#47):
Concur.

Comment #48:
Nowhere in the documentation provided is the process of the hydraulic numerical modeling described. This material should be included in the report.
Basis for Comment:
During midpoint review discussions, USACE personnel indicated that some of the information related to hydraulic modeling was included in other documents, not provided. Moreover, USACE personnel noted that this documentation was reviewed by HEC, considered to be an outside reviewer. While it may be reasonable to not submit this effort for additional review, the absence of modeling documentation from the project papers renders a lack of cogent and coherent workflow to the analysis.
Significance: LOW
This documentation has been reviewed elsewhere by outside reviewers. Regardless of this fact, the project documentation is incomplete in the modeling documentations absence.
Recommendation for Resolution:
An appendix should be included that describes in detail the methodology of the numerical modeling effort.
USACE Evaluator Response (#48):
<p>Non-Concur: Appendix F-2 and F-3; Section 4.3 and 4.4 of the appendix (Hydraulics and Sediment) and 4.4 of the attachment (Hydrology) provide a description of HEC-RAS and FLO-2D, the assumptions used in the models and the results. The main report GRR includes a description of assumptions used in FLO-2D in section 4.7.3.2 Floodplains from FLO-2D Output.</p> <p>The study team used both FLO-2D and HEC-RAS to evaluate specific behaviors for the entire study reach. A more accurate characterization is that FLO- 2D was used for the entire reach to model behavior in the floodplain, to capture the impacts of flood flows escaping the, often perched, floodway. HEC-RAS was used to model water surface behavior within the leveed floodway for the alternative evaluation. Had we used HEC-RAS to model stages that exceed an alternative’s levee height, the one-dimensional algorithm would have “straight-lined” the (perched) water surface across the entire valley, which was not believed to represent realistic behavior of the prototype. To more effectively represent the likely impacts, the flows that exceeded alternative levee heights were represented within the floodplain through overbank stage-discharge curves developed from FLO-2D.</p>
IEPR Panel Backcheck Comment (#48):
Concur , with the caveat that the discussion needs to be organized more clearly, and, where possible, with more detail. Because information relevant to the discussion is spread out across several appendices and attachments, following the discussion of the methods is difficult, even after repeated readings. As a suggestion, include an organized summary in the main document

with specific references to the appendices and attachments when technical discussions and background information are located elsewhere. These references will be most useful if they are organized in a way that allows the reader to follow step-by-step analysis procedures and reasoning.

Comment #49:
The analysis period should be identified up-front in the document. The document should indicate up-front the proposed project life and the duration upon which the analysis of Future No Action and Action conditions is based to ensure that this period is the same for all project impacts considered. The same is true for the construction period of the project so that short-term impacts versus long-term impacts can be distinguished.
Basis for Comment:
Passing references are found to the project life, for example in Section 3.5.4.2 where the text states “ <i>However, this is not expected to occur within the next 50 years, which is the period of analysis covered by this report</i> ” and again on p. 4-14 where the 50-year analysis period is mentioned. However, to ensure consistency, the analysis period for the entire GRR/SEIS should be specified early in the document. The same is true for the construction period; only one reference was located that mentioned the construction period may be up to 14 years. This raises the question of whether the impacts would still be considered short-term.
Significance: LOW
Completeness and consistency will improve document quality.
Recommendation for Resolution:
Mention and justify the analysis period up-front and ensure all sections are consistent.
USACE Evaluator Response (#49):
<p>Concur.</p> <p>Adopt: In addition to the instances where the period of analysis is discussion in alternative evaluation the following additions were made in the Executive Summary: “These alternatives and measures were compared to the forecasted future condition without a project (no action alternative) through a 50-year period of analysis” and in the end of the second paragraph in Chapter 2 Future Without Project Conditions: “. A forecast of conditions that will exist for a 50-year period of analysis without a Federal project was used as the baseline.”</p> <p>The phrase was also added to Bullets 2 and 3 under Section 4.1 Plan Formulation Process.</p> <p>Para. F-17 of the economics appendix identifies the analysis period and base year for the proposed levee. During the alternative formulation and evaluation process, the construction period was 168 months for the levees. The PDT did not believe that recomputing interest and benefits during construction for the levees, all of which had the same construction period across alternatives, would not alter plan selection or sizing. This document is trying to capture the decision making occurring during plan selection, and then refinements to the selected plan as design efforts continued and the final BCR was computed.</p> <p>Environmental impacts from the prolonged construction period would still be considered short term since the location of the impact (disturbance, noise, dust) is localized and transient. The</p>

assumption is that the construction of any one segment will not last an entire year and will therefore have a period of several months with not activity.

IEPR Panel Backcheck Comment (#49):

Concur, since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #50:
GRR/SEIS text should indicate whether tribes were consulted (if applicable).
Basis for Comment:
Section 2.6 text states <i>“To date, the Corps has received no tribal concerns regarding the proposed project. No traditional cultural properties are known to occur within or adjacent to the project area. No concerns regarding ITAs have been brought to the attention of the Corps.”</i> It would be helpful to indicate whether any tribes were invited to comment on previously issued documents.
Significance: LOW
While there may be few tribal concerns, the text should indicate whether tribes were consulted.
Recommendation for Resolution:
Report the information if available.
USACE Evaluator Response (#50):
Concur. Adopt: The revised GRR includes the responses from tribal consultation as well as the SHPO Section 6.6 has been updated to reflect the status of consultation and response letters provided in Appendix F-8. The sentence “No traditional cultural properties are known to occur within or adjacent to the project area.” was deleted from Section 2.6.
IEPR Panel Backcheck Comment (#50):
Concur , since the proposed changes will be addressed in the final draft GRR/SEIS.

Comment #51:
Text on p. 2-4 of the GRR/SEIS appears out of place.
Basis for Comment:
P. 2-4. The following text appears out of place in the existing conditions section and should be moved to the impacts section: <i>“During construction of new levee, soft clay layers near the foundation surface can be over-excavated and removed. Lower layers of existing spoil bank foundations have been previously consolidated by the upper layers placed on the existing spoil bank; therefore, only the weight of fill required to increase the height of the existing spoil bank would contribute to additional consolidation and settlement of the foundation. Since in most cases the new levee will be smaller than the existing spoil bank, consolidation and settlement of the foundation is considered to be minimal for the project. Areas where the new levee height is greater than the spoil bank will be evaluated for potential consolidation or settlement issues by analysis of the boring logs at those locations. The levee section will be overbuilt at locations where consolidation or settlement is deemed an issue by further analysis.”</i>
Significance: LOW
Effective organization will improve document quality.
Recommendation for Resolution:
Suggest moving the text to the Future Action condition description.
USACE Evaluator Response (#51):
Concur. Adopt: the text has been removed or moved to the appropriate discussion in the description of the recommended plan, Chapter 5.
IEPR Panel Backcheck Comment (#51):
Concur, since the proposed change will be addressed in the final draft GRR/SEIS.

Comment #52:
The aesthetics sections (existing conditions and future action) would greatly benefit from photographs or photomontages to provide an objective analysis of project impacts.
Basis for Comment:
The aesthetics section as written sounds contradictory: <i>“As discussed in the 1992 SEIS, the evaluation of visual qualities is a value judgment and is subjective, differing according to the perception of each individual. The general visual setting of the proposed project area is thought to be of high aesthetic quality, with the exception of the sporadic litter and domestic garbage.”</i> It might be easier to avoid the value judgments entirely and include photographs of the project site under existing conditions from different views. For the impacts section, it would be useful to have photomontage views (to scale) of what the newly-constructed berm would look like from major vantage points such as along I-25, from Socorro, or from the Bosque del Apache NWR.
Significance: LOW
Aesthetics is often not a major issue, but with a 43-mile-long levee, a more effective objective analysis is warranted.
Recommendation for Resolution:
Consider preparing photomontages of the study area under existing and future conditions to show the public views of the levee to scale. This can be done economically by many commercially available services and would make an understanding of the project much more accessible to the public.
USACE Evaluator Response (#52):
Concur. Adopt Later: We will review the text relative to value judgments. Much of the area is distant from traffic and the general public; therefore, we will likely adopt the view of an adjacent landowner or as the levee would be seen from highways crossings. We do not believe that graphic representations would be helpful because we would simply be replacing an existing structure with a similarly shaped structure.
IEPR Panel Backcheck Comment (#52):
Concur.

Comment #53:
Section 4.2 mentions study area problems that are historical and will not be addressed by the proposed plan.
Basis for Comment:
Section 4, Problem Formulation, is well prepared and thorough in its description of problems, objectives, and alternatives formulation. A minor comment is that the following problem is listed that will really not be addressed by the proposed project: <i>“Degradation of riparian and aquatic ecosystems is ongoing. This includes the continued fragmentation of remaining habitat, lack of overbank flooding (within the floodway), and the spread of non-native vegetation.”</i> These factors are a result of historical conditions that extend back several decades and as the text points out would continue under No-Action conditions because of the altered nature of the landscape within the entire river valley. The project is not going to restore the original floodplain of the river or contribute to rectifying these effects in a significant way. The last paragraph of Section 4.2 states <i>“The next step is to formulate an array of alternative solutions that solve the problems and meet the objectives of the study.”</i>
Significance: LOW
Increasing clarity will improve document quality.
Recommendation for Resolution:
Address the disparity in the text.
USACE Evaluator Response (#53):
Concur. Adopt Later: The problem list will be limited to those that are able to be addressed within this project authority, and the last sentence will state that solutions would be formulated in consideration of the identified problems (de-emphasizing “solve”).
IEPR Panel Backcheck Comment (#53):
Concur.

Comment #54:
Cultural resources text on p. 3-10 in the GRR/SEIS should be clarified.
Basis for Comment:
Section 3.4, p. 3-10. The paragraph on Future No-Action cultural resources ends with: <i>“The destruction in the town of San Marcial during the 1929 floods was such that most of the people moved, and the AT&SF closed their division headquarters in San Marcial and moved farther north.”</i> The point being made here is not clear to the reviewer.
Significance: LOW
Text quality will be improved by clarification.
Recommendation for Resolution:
Clarify the point being made.
USACE Evaluator Response (#54):
Concur. Adopt: The subject sentence was deleted to remove confusion. Additional information was added to the first sentence so that this Section 3.4 paragraph reads: Evaluation of the study area under future without-project conditions indicates that approximately 40 archaeological sites on the west side of the river and 37 sites along the east side of the river could be impacted in the event of a major flood, such as those that occurred in 1929 (one in August and the second in September) and again in 1937.
IEPR Panel Backcheck Comment (#54):
Concur , since the proposed changes are addressed in the final draft GRR/SEIS.

Comment #55:
GRR/SEIS text should be consistent in the treatment of wildlife habitat impacts based on comparisons with historical and current conditions.
Basis for Comment:
The text in Subsection 3.5.4.3 (b) (Bosque del Apache NWR, p. 3-16) as written is somewhat contradictory to the tone and description of the existing conditions section of the text, which emphasizes existing degraded ecological conditions in the watershed resulting from man's attempts at preventing the Rio Grande from doing what it would naturally: form meanders and flood regularly. Based on that description, one could argue that flooding the refuge would be the best thing possible for wildlife habitat, by restoring sediment and indigenous biota including wetland plant seeds, organic matter, and nutrient support to the remaining wetlands in the system. In contrast, the text on p. 3-16 implies significant adverse impacts to ecological resources would occur from flooding of the refuge. This section might be rewritten to emphasize the impacts on <i>infrastructure</i> (e.g. water level regulating structures, dikes, roadways) in the refuge that has been implemented through the years to maintain a highly artificial situation in order to attract wildlife through planting crops, etc., and to provide recreational opportunities for visitors. (It is actually stated similarly in Section 4.2 on p. 4-2, third bullet).
Significance: LOW
Clarification and consistency will improve document quality.
Recommendation for Resolution:
Consider revising the text accordingly to be consistent with Section 4.2 treatment of the issue.
USACE Evaluator Response (#55):
Concur. Adopt Later: We will revise Section 3.5.4.3 to clarify that periodic inundation may be beneficial to natural and managed habitats within the refuge, but uncontrolled flooding would incur damages to infrastructure and temporarily limit recreational opportunities.
IEPR Panel Backcheck Comment (#55):
Concur.

Comment #56:
Subsection 4.7.6.3 should indicate whether Tiffany Sediment Basin is included in the proposed plan.
Basis for Comment:
Subsection 4.7.6.3 states “Plans that include Tiffany Sediment Basin as a measure provides a trade-off of high water losses, long term (30-50 years) loss of riparian habitats and impacts to endangered species due to sedimentation and inundation of the basin. The eventual reconnection of this area with the river, however, would be highly beneficial to riverine species and provide a crucial function of the floodplain. Succession of the 2000 acre area to a more natural riparian community would occupy the period of analysis and eventually provide ecological benefits well beyond.” This may well be true, but it should be noted that the Tiffany Sediment Basin is not included as part of the tentatively-selected alternative.
Significance: LOW
Clarity will improve document quality.
Recommendation for Resolution:
Consider revising this section for clarity.
USACE Evaluator Response (#56):
<p>Concur.</p> <p>Adopt: Chapter 4 was reorganized in response to another comment to make the screening and plan selection more clear. The Tiffany Basin feature is presented as a passive and active method in sections 4.5.9 and 4.5.10 in the revised documents. The rationale for removing the “active method” from further consideration was strengthened to state: “A feasible solution to some of the potential effects of including the Tiffany Basin within the active floodway could not be developed. These factors included: the extended duration (30 or more years) to fill the basin with sediment; the entrapment and removal of endangered silvery minnow from the river habitat while simultaneously diverting sediment from the channel; the inability to promptly salvage diverted minnows from Tiffany Basin; and the high water depletion associated with evaporation and infiltration of river flows trapped in the basin.”</p> <p>Similarly the “Passive Method” was screened with the following rationale: “This method of sediment management has low installation cost (about \$780,000 less, August, 2010 prices) but extraordinarily high operations and maintenance costs (over \$16 million). Those costs are attributed to dispersing the equivalent of four dump trucks worth of sediment daily for over 30 years. Employing the sediment collection device has the same performance characteristics, and the same benefits identified for alternatives that include Tiffany Basin but incur a much larger cost. Since O&M is the responsibility of the local sponsor this alternative would place an unacceptable long-term burden on the MRGCD. This aspect of the Tiffany Basin feature is</p>

therefore not considered further.”

IEPR Panel Backcheck Comment (#56):

Concur, since the proposed changes are addressed in the final draft GRR/SEIS.

Comment #57:
In the GRR/SEIS, p. 6-8 could benefit from clarification.
Basis for Comment:
P. 6-8 states “ <i>Executive Order 11990, "Protection of Wetlands," requires all federal agencies to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. Wetlands are defined as areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Given the design considerations and construction best management practices discussed above, construction of any of the levee alternatives would conform to Executive Order 11990.</i> ” This may well be true, but a more site-specific discussion is warranted to focus specifically on the acreage of wetlands to be encountered and why the proposed project will not impact them. Earlier in the text it states that no wetlands will be impacted by the proposed alternative; this should be reiterated here with a statement such as “ <i>the project has been redesigned from the 1948 project to avoid impacts to wetlands entirely.</i> ”
Significance: LOW
More detail would improve document quality.
Recommendation for Resolution:
Consider making the suggested text change.
USACE Evaluator Response (#57):
Concur. Adopt: The Existing Conditions section will be revised to clarify that approximately 440 acres of wetland occur within the floodway of the study area, but no jurisdictional wetlands would be affected by proposed construction. This will be restated in the discussion of Executive Order 11990. Although the larger extent of work envisioned in the authorized plan would likely have affected wetland areas, we would not claim that the currently proposed project was designed to avoid those impacts.
IEPR Panel Backcheck Comment (#57):
Concur.

Comment #58:
Assertions regarding water quality from flood events on p. 6-11 require further support or modification.
Basis for Comment:
P. 6-11 states “ <i>Although periodic floodplain inundation outside of the existing spoil bank alignment has the potential for providing allochthonous material to the Rio Grande, historic and existing land uses west of the spoil bank also present potential threats to water quality. Following a spoil bank breach, floodwaters would likely be of low quality and would result in the introduction of potential contaminants (sewage, petroleum products) to the river, and, therefore, would not be considered beneficial to aquatic habitat and organisms.</i> ” Without measuring the actual contribution of contaminants or allochthonous material, the overall conclusion of low-quality contributions is unsupported.
Significance: LOW
Additional detail is warranted or the paragraph should be deleted.
Recommendation for Resolution:
Consider modifying the text to reflect the issue raised in the Comment.
USACE Evaluator Response (#58):
Concur. Adopt Later: We will revise the text to state that contamination is a general concern rather than a known effect.
IEPR Panel Backcheck Comment (#58):
Concur.