APPENDIX H RESPONSE TO COMMENTS

APPENDIX H

Salton Sea Authority (SSA) – Response to 20% Deliverable Comments

GENERAL COMMENTS

The following section addresses comments received by Tetra Tech, Inc. from Coachella Valley Water District (CVWD), Imperial Irrigation District (IID), and James Mercer (HSI Geotrans, QA/QC) for the SSA All-American Canal and Coachella Branch seepage study 20% deliverable document. Typographical, syntax, and vocabulary modifications which do not affect the technical content have been incorporated into this (50% deliverable) document without specific response. Specific responses to content and/or structure of the 20% document are outlined below.

SPECIFIC COMMENTS

Coachella Valley Water District

Table of Contents, Section 5: **"Groundwater Seepage from CB to Salton Sea and Adjacent Wetlands" should read "Groundwater Seepage from CB".**

Response: The change has been made.

Appendix B.1 **"Linkage between Conceptual and Numerical Model" should read "Description of Numerical Model".**

Response: The change has been made.

Figure 2-6c: **The Salt Creek drainage south of Dos Palmas Springs should have two separate channels above the confluence, and they should be dashed to indicate seasonal flow. In addition, the portion of the CB between Siphons 13 and 14 should be shaded per the key to indicate an unlined portion of the canal.**

Response: The changes have been made to the figure.

Page 2-16, 4th paragraph: **The paragraph beginning "In 1942, construction..." should be removed from the text.**

Response: The paragraph has been removed from the text.

Imperial Irrigation District

Page 1-3, 3rd paragraph: **Something is missing in the second sentence; the first half of the sentence doesn't match the end of the sentence.**

Response: The sentence has been modified and now reads, "The wetlands mitigation measures proposed in the AAC EIS/EIR and the CB EIS/EIR

will be reviewed based on the quantification of reduced seepage losses to the existing adjacent wetlands."

Page 2-8, 4th paragraph: **IID currently has 10 regulating reservoirs rather than the 6 reservoirs sited by Montgomery Watson (in reference).**

Response: The change has been made to the text.

Figure 2-4: **The basins and boundaries are identified and named with no Imperial Basin shown.**

Response: Figure 2-4 depicts "surface" hydrologic features, wherein the hydrologic areas are identified by the major drainage in that area. The Imperial Valley Basin refers to the corresponding groundwater basin, which is shown on Figure 2-7 with other regional groundwater basins in and around the study area as defined by the California Department of Water Resources.

Page 2-26: **In Section 2.2, Land Use, only the Imperial Basin is described. It would make more sense to describe each basin within the study area that is listed in Figure 2-4, and if the Imperial Basin is described, it should be defined and shown on Figure 2-4.**

Response: In the first sentence of Section 2.2, Imperial "Basin" has been changed to Imperial "Valley" to reflect that what is being referenced is a general geographic region which makes up a considerable portion of the study area, and not a groundwater basin. The groundwater basins shown on Figure 2-7 are described individually in Section 3.1, Definition of Groundwater Basins in the Study Area.

Page 2-26, 4th paragraph: **The first paragraph, second sentence in Section 2.3.1, Surface Water, "...surface water is in general nonpotable." should be changed to "...groundwater is in general nonpotable."**

Response: This section deals specifically with surface water. Section 2.3.2 is specific to groundwater. The second sentence in this paragraph has been modified from "...on the quality of surface water, and surface water is in general nonpotable." to "...on the quality of surface water."

Figure 2-9: **The legend does not appear to be correct.**

Response: The figure title has been changed to "Water District Boundary Map for Study Area", and the CVWD and IID district boundary color designations have been specified in order to clarify the figure.

James Mercer, HSI Geotrans

Page 1-3, 2nd paragraph: **The first sentence in this paragraph references the features Pilot Knob and Drop 3 on Figure 1-2. These feature locations are not shown on any figure in the report.**

Response: The locations of Pilot Knob and Drop 3 have been added to Figure 1-2 as well as Figure 2-6b.

Page 2-7, 3rd paragraph: **The third sentence, "not percolating into subsurface storage eventually draining..." should read "...not percolating into subsurface storage or evaporating eventually draining..."**

Response: The change has been made.

Page 2-8, 3rd paragraph: **Show features Drop No. 1 and Siphons 14 and 15 on a map.**

Response: The features have been included in Figure 2-4.

Page 2-25, 3rd paragraph: **The recharge estimate of 10,000 acre-feet per year from precipitation (3 inches/year) seems high.**

Response: The recharge value cited is from U.S.G.S. Professional Paper 486K (Loeltz et al. 1975), page K23, "Recharge also results from infiltration of runoff, mainly in washes and drainageways that discharge to the central part of the valley or to the Salton Sea. This recharge is estimated to average somewhat less than that from the tributary area of San Felipe Creek. Thus, the average annual recharge due to precipitation within the study area probably is somewhat less than 10,000 acre-feet." However, the U.S.G.S. model for the Ocotillo area (Skrivan 1977) cites a recharge rate of 0.02 inches per year over a ½ million acre area of unirrigated land in the Imperial Valley which is approximately 800 acre-feet per year of recharge. The text has been revised to note this discrepancy.

Salton Sea Authority (SSA) – Response to 50% Deliverable Comments

GENERAL COMMENTS

The following section addresses comments received by Tetra Tech, Inc. from Coachella Valley Water District (CVWD), Imperial Irrigation District (IID), the peer review team (Alice Campbell, Ernest Weber, and Dennis Williams), and James Mercer (HSI Geotrans, QA/QC) for the SSA All-American Canal and Coachella Branch seepage study 50% deliverable document. Typographical, syntax, and vocabulary modifications which do not affect the technical content have been incorporated into this (75% deliverable) document without specific response. Specific responses to content and/or structure of the 50% document are outlined below. Where multiple reviewers have submitted the same or similar comment, only one response to the comment has been documented.

SPECIFIC COMMENTS

Coachella Valley Water District

Page 1-1, last sentence: **"This report is the 20 percent..." should read "This report is the 50 percent...".**

Response: The correction has been noted, and the "75 percent" document has been appropriately referenced in this sentence.

Page 1-3, 3rd paragraph: **At the end of the first sentence, remove "...and to those wetlands that would be eliminated by the AAC and CB canal lining projects."**

Response: This portion of the sentence has been modified to read "...and to existing adjacent wetlands of concern."

Page 5-26, 3rd paragraph: **The last sentence in the paragraph referencing "wetlands" ...**

Imperial Irrigation District

Page 2-1, 2nd paragraph: **In the last sentence of the paragraph, the historic recorded low elevation of the modern Salton Sea was –252.2 feet on December 19, 1919. The current elevation of the sea is -225.9 feet.**

Response: The sentence has been modified, and now reads "The historic recorded low elevation of the modern Salton Sea was 252.2 feet below sea level on December 19, 1919 (IID, personal communication, 1999). The current elevation of the sea (1999) is approximately 226 feet below sea level.

Page 2-8, 3rd paragraph: **In the second sentence, "1942" should read "1940".**

Response: The change has been made.

Page 2-8, last paragraph: **The first sentence should read "...from Drop 3 to Drop 5,..."-there is no drop 6.**

Response: The change has been made.

Pages 2-9, 2-11, Figure2-3: **Soils map and information, pages 2-9 and 2-11 – the soils information appears to be incorrect. Neither the map nor Table 2.1 match the USDA-SCS Imperial County Soil Survey. Specifically "CA 606" as shown in Figure 2.3 is Rositas, not Glenbar. "CA603" as shown in Figure 2-3 is Glenbar, not Gadsden. Gadsden soils are not found in the Imperial Valley. In addition, the permeability of Glenber soils ranges from .06-0.2 in/hr, and 0.2-0.6 in/hr, not 6-20 in/hr. The permeability of Rositas soils (fine sands) is 6-20 in/hr.** ***See Soil Survey of Imperial County California,*** **USA-SCS, 1980.**

Response: The soils data currently reflected in the 50% submittal was derived from the State Soil Geographic (STATSGO) data base. Figure 2-3 has been modified to conform to the relevant soil survey published by the Natural Resource Conservation Service (Soil Conservation Service). Table 2-1 containing STATSGO data has been deleted from the 75% submittal.

Page 2-12, 2nd paragraph: **The third (actually fourth) sentence in the first full paragraph at the top of the page – tile drains in the Imperial Valley are usually 5 to 6 feet deep. A few may be as deep as 7 feet at the outlet end, none are anywhere near 10 feet deep.**

Response: The sentence has been revised. It now reads "Tile drains are typically at a depth of 5 to 6 feet (a few may be as deep as 7 feet at the outlet end), and carry subsurface water containing dissolved salts to sumps at the tail end of selected fields or discharge directly to drainage canals."

Page 2-19, Figure 2-6b: **This figure, as well as several others, show the proposed AAC lining project starting at the Colorado River. The proposed AAC lining begins one mile west of Pilot Knob, as noted on page 3-1 (actually page 1-3).**

Response: Figures 1-2 and 2-6b have been modified to indicate the proposed AAC lining beginning one mile west of Pilot Knob, as noted on page 1-3.

Page 2-23, 1st paragraph: **The first paragraph is incomprehensible. Looks like something got edited out that should have been left in.**

Response: The second sentence in the first paragraph has been removed, as it was more specific to groundwater recharge and Colorado River channel oscillations rather than historic development of the canal system. The first sentence in this paragraph "By 1900, over one thousand people..." is now part of the next paragraph, and should make more sense now.

Page 2-28, 1st paragraph: **The New River derives roughly 65% of its flow from irrigation return flows in the Imperial Valley, with the remaining 35%**

(175KAF out of 491KAF) of water flowing from Mexico at the International Boundary.

Response: The sentence has been modified to reflect these quantities.

Page 2-7, 4th paragraph: **The discussion of the New and Alamo Rivers as large agricultural drainage channels needs to be included or they should be located under the heading "Canals and Drains" on page 2-8.**

Response: The referenced paragraph indicates that the New and Alamo Rivers "intercept post irrigation seepage collected along an elaborate subdrain tile system." The Rivers are an integral part of the drainage system and essentially serve as large agricultural drainage channels. However, the Rivers are a natural drainage feature of the valley which were "considerably widened and deepened between 1904 and 1907, when the bulk of Colorado River water was entering Imperial Valley...". One could argue that without the Colorado River flooding during this period, the channels may not exist in their current morphology. However, the channels were natural depressions which were simply further incised by the flooding. Although some modifications have been made to enhance their ability to capture agricultural runoff, to include the New and Alamo Rivers as part of the "Canals and Drains" section infers that they are engineered structures, which is not the case.

PEER REVIEW TEAM

Alice Campbell

General: **Add San Andreas and Imperial Faults to all water level contour maps in order to see the relationship between possible fault barrier effects and water level contours/groundwater flow direction.**

Response: The primary fault lineations within the study area have been superimposed on the groundwater contour maps. In addition, the faults have been included on aerial photograph and satellite imagery figures.

Figure 2-2: **The geology map uses antiquated terminology, does not reference the source, does not show the shoreline of ancient Lake Cahuilla, etc.**

Response: The geology map has been reconstructed, using California Division of Mines and Geology Santa Ana, Salton Sea, and San Diego-El Centro map sheets in a composite with accompanying map symbols.

Page 2-23, Section 2.1.5: **This section needs to tie geology to model assumptions explicitly.**

Response: Text has been added to the section in order to clarify which hydrostratigraphic units correspond to layers 1, 2, and 3 in the model, and their relative positions in the geologic column.

Ernie Weber

General:	**The majority of comments submitted by Mr. Weber generally coincided with Ms. Campbells' comments and other comments which have previously been addressed.**
Figure 2-8:	**The land use map appears incomplete, illustrating land use for the south Coachella Valley, and none for the Central Imperial Valley.**
Response:	The map was obtained from the University of Redlands database, and has not been completed to date. This particular figure has been eliminated, and text in the "land use" section of the report now refers to Figure 2-6a as a general reference, which clearly illustrates the predominantly agricultural land use in the study area.
Table 2-1:	**The permeability values assigned for individual soil classifications in this table are inconsistent with the drainage classifications.**
Response:	The soils data currently reflected in the 50% submittal was derived from the State Soil Geographic (STATSGO) database. Figure 2-3 has been modified to conform to the relevant soil survey published by the Natural Resource Conservation Service (Soil Conservation Service). Table 2-1 containing STATSGO data, has been deleted from the 75% submittal.

Dennis Williams

Page 1-5, Figure 1-2:	**Show Siphons 7 and 32**
Response:	Siphons 7 and 32 have been labeled on Figure 1-2.
Page 2-1, 2nd paragraph:	**The first sentence of the paragraph "...to the north-northwest by the Orocopia and Chocolate Mountains,..." should read "...to the north-northeast...".**
Response:	The correction has been made.
Page 2-8, 5th paragraph:	**"...at the final connection to the West Side Main Canal...", the "West Side Main Canal" was named as "Westside Main Canal" in other places.**
Response:	A universal change has been made to the document, and the correct designation is "Westside Main Canal".
Page 2-9, Figure 2-3:	**The Westside Main Canal was mislabeled as "West Main Canal".**
Response:	The label has been corrected and now reads "Westside Main Canal".
Page 2-28, 5th paragraph:	**In the second sentence of the paragraph "...water is delivered annually to over 500,00 acres of agricultural land.", should be "...over 500,000 acres...".**

Response: The correction has been made.

Page 3-1, 3rd paragraph: **The fourth sentence of the paragraph reads "Natural recharge to the basin has been estimated to be 1,200 acre-feet per year." Natural recharge to the Coachella Basin has been estimated to be 80,000 acre-ft per year by the cited reference (Department of Water Resources, 1975).**

Response: The quantity cited was an estimate of natural recharge for that portion of the Coachella Basin represented by the 13 square miles within the study area. This was unclear in the text, and in reality, natural recharge does not occur uniformly across the aerial extent of any basin. The reference has been changed to reflect the natural recharge to the basin as a whole, according to the cited reference.

Page 3-2, 7th paragraph: **"...the San Andreas Fault in the region since the middle Eocene (Crowell and Susuki, 1959)". The cited reference is not listed in the Section 10 Bibliography.**

Response: The reference has been added to the bibliography.

Page 3-4, 2nd paragraph: **"... and 1960 for the East Mesa (Olmstead et al. 1973...". The cited reference is not listed in the Section 10 Bibliography.**

Response: The reference has been added to the bibliography.

Page 3-5, Figure 3-1: **East Mesa should be labeled. Faults should be added in this figure to show groundwater barrier effect.**

Response: The revisions have been made.

Page 3-7, 3rd paragraph: **"This feature is attributed to a groundwater barrier that occurs in this area, which appears to be associated with the Elsinore Fault. Note that despite the presence of faults in eastern Imperial Valley such as the Algodones Fault, the groundwater table does not appear to reflect a barrier effect in the eastern study area." The Elsinore and Algodones Faults were not discussed in Section 3.2.1 "Stratigraphy and Structure" and were not shown in Figure 2-2 "General Geologic Features of Study Area".**

Response: The Elsinore Fault is outside of the study area. This section of the report was written prior to establishing the final boundaries of the model area, and this particular paragraph has been deleted. The following text has been included in the previous paragraph; "Despite the presence of the San Andreas and Algodones Faults in the East Mesa area, the groundwater contours do not necessarily appear to create a barrier effect. Mounding effects may also be directly attributable to canal seepage or a combination of the two. The Algodones Fault is an unmarked dotted line northeast of the San Andreas Fault on Figure 2-2a.

Page 3-7, 4th paragraph:	**"Groundwater levels in the study area have varied significantly over time...", however, the next paragraph "In general, the water table in the central Imperial Valley has not changed significantly". Please specify the areas having significant groundwater level variations.**
Response:	The first sentence of the paragraph has been modified, and now reads "Groundwater levels adjacent to the canals in the East Mesa area have varied significantly over time, primarily in response to seepage of imported Colorado River water."
Page 3-8, 2nd paragraph:	**"The 1992 period was chosen..." should be "1993".**
Response:	The change has been made.
Figures 3-4 and 3-5:	**Label aquifers and aquitards.**
Response:	The designations have been added in the figure legend.
Page 3-21, 4th paragraph:	**"...and a deeper confined alluvial aquifer that is bounded above by the aquitard...". Aquitard implies a "leaky" aquifer so that the deeper confined aquifer is actually "semi-confined".**
Response:	The sentence now reads "semi-confined"
Page 4-2, 2nd paragraph:	**"The 70 percent decline in seepage from this upper gauge-defined reach...". The "upper" should be "lower".**
Response:	The change has been made.
Page 4-16, 2nd paragraph:	**"From 1942 to 1998, seepage from the AAC...(Bureau of Reclamation 1991)". The 1998 is later than the 1991 cited reference.**
Response:	The sentence has been corrected, and now reads "From 1948 to 1988,..."
Page 4-33, 3rd paragraph:	**"The AAC EIS/EIR presented a similar estimate of 90 percent of the total AAC seepage, or 95,850 af/yr, for the AAC seepage that flows into East Mesa." The "East Mesa" should be "Mexicali Valley".**
Response:	The change has been made.
Page 5-1, 4th paragraph:	**"The decline from the initial seepage rate of the upper gauge-defined reach...". The "upper gauge-defined reach" should be "section below check 6A".**
Response:	The change has been made.

James Mercer, HSI Geotrans

Page 4-34, 1st paragraph:	**Add a last sentence to this paragraph; "The groundwater model will be used to refine this estimate."**
Response:	The sentence has been added to the text.
Page 4-33, 1st paragraph:	**Onto the last sentence, add "...without using a groundwater model."**
Response:	The addition has been made.
Figure 4-1:	**What about the last 10 years of data from 1989-1999?**
Response:	The last 10 years of data for the upper gauged reach have only recently been acquired from IID, and have been added to the figure. The lower gauged reach data is unavailable for 1989-1999.
Page 3-28,Table 3-2:	**The "af/yr" designation has also been used but not defined in Table 3-1 (as acre-feet per year).**
Response:	The defining footnote has been added to Table 3-1.
Page 3-22, 1st paragraph:	**What about drainage to the wetlands that are part of this study?**
Response:	The last sentence of the paragraph has been modified, and now reads, "...and discharge into the Salton Sea and adjacent wetlands."
Page 3-18, 3rd paragraph:	**In the 2nd sentence, an effective porosity of 15 percent is cited, which is relatively low for sands and gravels. Specific yields (essentially effective porosity for sands and gravels) used later are 20 to 25 percent.**
Response:	The effective porosity used to calculate groundwater velocity has been changed to 20 percent, with a resultant estimated groundwater velocity of 450 feet per year for the East Mesa area.

Salton Sea Authority (SSA) – Response to 75% Deliverable Comments

GENERAL COMMENTS

The following section addresses comments received by Tetra Tech, Inc. from Coachella Valley Water District (CVWD), Imperial Irrigation District (IID), and James Mercer (HSI Geotrans, QA/QC) for the SSA All-American Canal and Coachella Branch seepage study 75% deliverable document. The peer review team (Alice Campbell, Ernie Weber, and Dennis Williams) has submitted a final report dated 12 June, 1999, which, in addition to our responses, make up Appendix D of this document. Typographical, syntax, and vocabulary modifications which do not affect the technical content have been incorporated into this (90% deliverable) document without specific response. Specific responses to content and/or structure of the 75% document are outlined below. Where multiple reviewers have submitted the same or similar comment, only one response to the comment has been documented.

SPECIFIC COMMENTS

Coachella Valley Water District

<u>Page E-2, 1st paragraph:</u> **At the end of the paragraph, add the sentences "Wetlands are dominated by an invasive exotic phreatophyte – salt cedar. Salt cedar has taken over approximately 50 percent of total wetland acreage along the AAC and 70 percent along the CB.".**

<u>Response:</u> The sentences have been added to the text with the appropriate references for the values cited (Bureau of Reclamation 1993, 1994).

<u>Page E-3, 2nd paragraph:</u> **Add the sentence "The approach in mitigation was one of exchange and replacement of the invasive, low value salt cedar habitat for higher value screwbean mesquite, honey mesquite, and other native habitat.".**

<u>Response:</u> The sentence has been added to the text.

<u>Page E-3, 3rd paragraph:</u> **Add the following text: "The Model predicts much lower reductions in seepage in the CB lining project than originally projected in the draft CB EIR. Original EIR documentation projected immediate (within 10 years) reductions in evapotranspiration resulting in losses of 4,293 acres of wetlands. Of that 3,420 acres, 80 percent of the acreage would consist of pure stands of salt cedar. To mitigate for these losses, the Draft EIR called for revegetation with native vegetation such as California fan palms, honey mesquite, screwbean mesquite, cottonwood/willow, and riparian shrubs; acquisition of riparian and marsh communities; and maintenance of flows in Salt Creek (up to 7,000 acre-feet was reserved, as needed, to provide for mitigation.). When modeled, these mitigation commitments result in surface and evapotranspiration demands lower than current natural groundwater discharges. Recognizing that surface water will be a part of mitigation for lining the CB, model studies indicate that**

natural discharges from groundwater storage will be sufficient to sustain proposed mitigation measures well beyond 2026.".

Response: The text has been added.

Page 2-18, 5th paragraph: **After the first sentence, add the following two sentences; "These wetlands are dominated by an invasive exotic phreatophyte: salt cedar. Salt cedar has taken over approximately 50% of total wetland acreage."**

Response: The sentences have been added to the text.

Page 2-19, 2nd paragraph: **After the second sentence, add the sentence "Salt cedar has taken over approximately 70% of total wetland acreage."**

Response: The sentence has been added to the text.

Page 3-4, 3rd paragraph: **The fifth sentence should read "Prior to construction of the AAC and CB, groundwater contours were influenced by the Alamo Canal and showed only a westward gradient (see Figure 4-3).**

Response: The sentence has been modified and now reads "Prior to construction of the AAC and CB, groundwater contours in the region were influenced by the Alamo Canal and exhibited a generally westward gradient (see Figure 4-3).

Page 5-2, 1st paragraph: **The third sentence "...unknown because it occurred prior to the Coachella Branch lining in 1980." should be modified to read "...probably the result of the removal of the original bentonite liner concurrently with intensive aquatic weed removal efforts in the 1970's and 1980's. Prior to the construction of the parshall flumes, during the lining of the first 49 miles, the measurement of seepage loss in the middle section was uncertain."**

Response: The sentence has been modified as stated.

Page 5-5, Table 5-1: **Under the table footnotes, add "Total Wetlands consist of 70% Salt Cedar".**

Response: The footnote addition has been made.

Page 5-16, Section 5.2.4: **Add the text "Wetlands are dominated by an invasive exotic phreatophyte: salt cedar. Salt cedar coverage has expanded at the expense of native vegetation and has taken over approximately 70% of total wetland acreage. Under the draft EIR, canal lining mitigation for loss of riparian vegetation shall be accomplished through revegetation (California fan palms, honey mesquite, screwbean mesquite, cottonwood, willow, and riparian shrubs), acquisition of riparian/marsh communities, and maintenance of flows in Salt Creek."**

Response: The text has been added.

Page 5-22, 3rd paragraph: **In the third sentence, add the text "...(ignoring displacement by salt cedar)..."**

Response: The text "...(disregarding propagation of salt cedar)..." has been added.

Page 5-24, Section 5.3.6: **The last sentence "...lined, but mitigation is not proposed because the current users do not have established groundwater rights for CB canal seepage water." should read "...lined. CVWD maintains a domestic water system in the Hot Mineral Spa area and will provide domestic service at standard rates in accordance with current District ordinances."**

Response: The sentence has been modified as stated.

Page 7-6, 1st paragraph: **Add the following sentence to the end of the paragraph: "For comparison, the Draft EIR mitigates for a 75 percent drop in the CB wetlands within 10 years."**

Response: The text has been added.

Page 8-7, section 8.4.1: **Add the following text to the end of the section: "Specifically, the mitigation commitments take into account current wetlands which are dominated by an invasive exotic phreatophyte: salt cedar. Salt cedar has taken over approximately 50% of total wetland acreage in the AAC and 70% for CB. Mitigation measures include the replacement of the poorer quality desert riparian wetlands with higher quality native marsh, honey mesquite, and screwbean mesquite.**

Response: The text has been added.

Imperial Irrigation District

Comments received from IID were generally editorial in nature, or had already been addressed by other reviewers. The majority of the comments were specific to additional text for table clarification. In general, text modifications made subsequent to the 75% deliverable which did not affect the technical content of the document were reviewed by IID and were acceptable.

James Mercer, HSI Geotrans

Page 6-2, 3rd paragraph: **At the end of the paragraph, add the sentence "The MODFLOW code has been well tested and is widely accepted by the technical community.".**

Response: The sentence has been added to the paragraph.

Page 6-13, 1st paragraph: **The Hsieh and Freckleton (1993) reference is not in the bibliography.**

Response: The reference has been added to the bibliography.