Responses To Public and Peer Review Comments Per California Environmental Quality Act On Sedimentation/Siltation Total Maximum Daily Load (TMDL) for the Imperial Valley Drains: Niland 2, P, and Pumice Drains, and Implementation Plan

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INTRODUCTION

This report presents the Regional Board staff's response to public and peer review comments received on the proposed Basin Plan amendment (and related documentation) to the Water Quality Control Plan for the Colorado River Basin (Basin Plan) that would establish a Sedimentation/Siltation TMDL for the Imperial Valley Drains. This report addresses written comments received by the Regional Board pursuant to the Regional Board's April 5, 2004 deadline for public comment submittal, and includes responses to all written comments received up to May 14, 2004.

PUBLIC REVIEW COMMENTS AND RESPONSES

Each Public Review comment letter received by the Regional Board was assigned a number (e.g., Letter 1, Letter 2, etc.), and each substantive comment within the letter was assigned an alphabet letter. For example, the first substantive comment in Letter 1 is identified as "1A," the second one is identified as "1B," and so on. The Regional Board's response is immediately below each comment.

Letter 1: Native American Heritage Commission

1A *General comment - Project-specific cultural resource impacts are yet to be addressed for this project. To adequately assess the project-related impact on cultural resources, the Commission recommends the following action (detailed in Comments 2-5) be required.*

The requested information regarding project-specific cultural resource impacts was addressed in the California Environmental Quality Act (CEQA) Environmental Checklist and Determination, a stand-alone supporting document to the draft Staff Report for this TMDL. Specifically, the information is contained in "V. Cultural Resources" of the chapter titled "Environmental Checklist Discussion." Much of this information is detailed in our response below, with further clarification of our analysis. We will revise the draft CEQA Environmental Checklist and Discussion for this TMDL to make our rationale more clear.

The proposed project will not cause a substantial adverse change in the significance of historical or archaeological resources, and will not disturb any human remains including those interred outside of formal cemeteries. Management Practice (MP) implementation and compliance monitoring will involve limited land disturbance, on land that already has been disturbed (i.e., on existing agricultural drains/canals and on farmland that has been cultivated for at least the last 60 years). Any such historical or archaeological resources or human remains already would be identified and protected if they occur on-site. It is unlikely that MP implementation would expose or damage cultural resources more than past and current farming practices already have (if these cultural sites exist in the project area). Reduced sediment levels in the subject drains themselves will not affect such resources.

The Regional Board is not aware of any such resources in the project area. The Regional Board held a CEQA Scoping Meeting on April 29, 2002, early in the development stage of this proposed TMDL. Local tribes and tribal agencies were invited (via letter) to attend this meeting to discuss CEQA-related issues that should be brought to the Regional Board's attention. Additionally, a notice for this CEQA Scoping Meeting was published in local newspapers, libraries, and post offices. The Regional Board did not receive any comments identifying the existence of or probable existence of sensitive historical or archaeological resources or human remains interred outside of formal cemeteries. Local tribes and tribal agencies invited included the: Agua Caliente Band of Cahuila Indians, Morongo Band of Mission Indians, Twentynine Palms Tribal Environmental Protection Agency, Torres Martinez Desert Cahuilla Indian Tribe, Fort Mohave Tribal Council, Quechan Indian Tribe, Colorado River Indian Tribes, U.S. Bureau of Indian Affairs (Colorado River Agency), and U.S. Bureau of Indian Affairs (Fort Yuma Agency). As stated before, our CEQA analysis indicates that the project would have no significant impacts on cultural resources.

1B *The Commission recommends the following action be required: Contact the appropriate Information Center for a record search. The record search will determine:*

- *If a part or all of the area of project effect (APE) has been previously surveyed for cultural resources.*
- *If any known cultural resources have already been recorded on or adjacent to the APE.*
- *If the probability is low, moderate, or high that cultural resources are located in the APE.*
- *If a survey is required to determine whether previously unrecorded cultural resources are present.*

The Regional Board is not aware of any such resources in the project area, despite holding a CEQA Scoping Meeting. Please see our response to Comment 1A for further discussion of likelihood of cultural resources and communication with local tribes.

1C *The Commission recommends the following action be required: If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.*

- *The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure.*
- *The final written report should be submitted within 3 months after work has been completed to the appropriate regional archaeological Information Center.*

The Regional Board is not aware of any such resources in the project area, despite holding a CEQA Scoping Meeting. Please see our response to Comment 1A for further discussion of likelihood of cultural resources and communication with local tribes.

1D *The Commission recommends the following action be required: Contact the Native American Heritage Commission for:*

- *A Sacred Lands File Check. (USGS coordinates are needed to conduct this records check).*
- *A list of appropriate Native American Contacts for consultation concerning the project site and to assist in the mitigation measures.*

The Regional Board is not aware of any such resources in the project area, despite holding a CEQA Scoping Meeting. Please see our response to Comment 1A for further discussion of likelihood of cultural resources and communication with local tribes.

1E *The Commission recommends the following action be required: Lack of surface evidence of archaeological resources does not preclude their subsurface existence.*

- *Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archaeological resources, per California Environmental Quality Act (CEQA) 15064.5 (f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.*

- *Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans.*
- *Lead agencies should include provisions for discovery of Native American human remains in their mitigation plan. Health and Safety Code 7050.5, CEQA 15064.5 (e), and Public Resources Code 5097.98 mandates the process to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.*

Please see our response to Comment 1A for further discussion of likelihood of archaeological resources and communication with local tribes.

Letter 2: United States International Boundary and Water Commission

2A *For the record we would like to reiterate our position on the proposed sedimentation/siltation TMDL for the New and Alamo Rivers. The USIBWC does not have the authority to enforce TMDLs on transboundary flows entering the United States. The USIBWC does not have the primary responsibility for ensuring that discharges from Mexico do not cause or contribute to a violation of this TMDL. The USIBWC notes that actions in Mexico for water quality control in the New River and the Alamo River are based on legislation in force in that country. Further, the USIBWC notes that actions in Mexico to meet water quality control loads in the United States are developed through cooperative arrangements and agreements such as those mentioned in the Regional Board staff report. However, the extent to which the United States Government can ensure that Mexico can achieve actions in those cooperative arrangements and agreements depends on the terms of those arrangements and agreements. The USIBWC continues to examine the obligations assumed by Mexico in the context of what actions the United States may ask of Mexico to ensure those obligations which may provide conditions in the waters of the New and Alamo Rivers in Mexico that arrive at the international boundary that would assist California in attaining the sedimentation/siltation load allocations downstream of the international boundary.*

The USIBWC is not named as a responsible party in the draft Staff Report for the Imperial Valley Drains Sedimentation/Siltation TMDL. The subject drains are sustained and dominated by agricultural return flows discharged from Imperial Valley farmland. That notwithstanding, while we appreciate the USIBWC's perspective regarding binational agreements about wastes from Mexico, we question how relevant Treaty Minute No. 264 actually is in light of the past, on-going, and projected violations of the Treaty.

Letter 3: United States Environmental Protection Agency

3A *General question – Does the fact of the transfer of 300,000 acre-feet from the Colorado River before it reaches the Valley need to be factored in to this analysis?*

The requested information regarding the water transfer was factored into the analysis and discussed in the draft Staff Report for this TMDL, in Section C of the "Load Allocations and Wasteload Allocations" chapter. Much of this information is detailed in our response below, with further clarification of our analysis. We will edit the revised Staff Report for this TMDL to make it more clear that the water transfer was factored into the analysis.

The signed Colorado River Quantification Settlement Agreement involves a decrease in Imperial Irrigation District (IID) irrigation deliveries of as much as 300,000 acre-feet/year, which will result in a decrease in the amount of water that drains from farmland into the Imperial Valley drains, including the subject drains. The transferred water will be irrigation water "conserved" by IID and Imperial Valley farmers. This water will be diverted to other water agencies (e.g., San Diego County Water Authority).

Decreased irrigation deliveries result in the same concentration of TSS, but a lower load, due to decreased water flow. The estimated corresponding flow in the subject drains would be 31,630 acre-feet/year, assuming that the 300,000 acre-feet/year irrigation delivery reduction will result in an equal decrease in total drain flow as a worst-case scenario. The calculation follows below:

> subject drain total flow - (water transfer loss x (subject drain total flow / IID total flow))
> 45,340 – (300,000 x (45,340 / 992,122)) = 31,630 acre-feet/year

The corresponding load in the subject drains would be 17,990 tons/year, as opposed to the 25,790 tons/year now with the current flow. The calculation follows below, where TSS = Total Suspended Solids:

> flow x TSS x conversion factor
> 31,630 x 418.3 x .0013597 = 17,990 tons/year

The TMDL concluded that the assimilative capacity (to attain water quality standards) for the subject drains is 12,330 tons/year, with the total load allocation for the drains themselves accounting for 11,097 tons/year. (The remainder of assimilative capacity is allocated to natural sources and a margin of safety.) Therefore, even with the water transfer accounting for a load decrease as calculated above (17,990 tons/year), this 17,990 tons/year of sediment carried by the subject drains would still be higher than what the drains can carry while still meeting the drains' assimilative capacity. Therefore, this TMDL would still be needed to protect beneficial uses of the subject drains.

Additionally, any environmental consequences of reduced water flow due to the Quantification Settlement Agreement must be addressed by those responsible agencies. This proposed TMDL reduces the amount of sediment/silt entering the Imperial Valley Drains (through implementation of Management Practices), but does not reduce the amount of water entering the drains.

3B *General question – One of the biggest impacts on the Salton Sea as a result of the water transfer is expected to be to air quality. Folks living around the Sea have brought photographs of dust storms that look very impressive to the agencies' attention. Does this stop at the Sea and not carry material to the Valley and its open waterways?*

The Imperial Irrigation District's Final Environmental Impact Report/ Environmental Impact Statement (CH2M-Hill 2002) for the water transfer addressed the air quality impacts of their proposed water transfer, and outlined an air quality mitigation plan that included:

a) Restricting public access to minimize disturbance of natural crusts and soils surfaces in future exposed shoreline areas.
b) Establishing a research and monitoring program as the Sea recedes to study historical shoreline dust emissions; evaluate land exposure and ownership over time; conduct

sampling and analysis of shoreline sediments; analyze the response of Salton Sea salt crusts to environmental factors; implement a meteorological, PM10, and toxic air contaminant monitoring program; conduct a health risk assessment if increased levels of toxic contaminants are released due to the Project; and evaluate potential dust control measures.

c) Create or purchase offsetting emission reduction credits.
d) Implement direct emission reduction at the Sea.

Current levels of dust emissions have been incorporated into the TMDL. The TMDL may be adjusted in the future as necessary, should new information about dust emissions come to light.

3C *General question – It is expected that land will have to be fallowed to reduce Imperial Valley's use of water, if not immediately, then certainly over time (15 years is what California has to bring its use down to 4.4 million acre-feet/year). What, if any, impact will this have on sediment load to the drains? On the one hand, it should mean less sediment-carrying water to the drains; on the other hand, the dry soil may become more susceptible to aolian forces. A discussion of the volume of wind-carried sediment that might impact the water bodies per year should be included in the analysis.*

Yes, we concur that fallowed land will mean less sediment-carrying water entering the drains. Beyond that, we cannot evaluate the projected impacts that wind may have on local dry fallowed land. Such an assessment is well beyond the scope of the required analysis. Please see the response to Comment 3B for further discussion of wind-borne soil.

3D *Specific question – What are the sources for the information about soils on p. 17? References would be helpful. The make-up of the soil indicates that it would be less likely to be moved by wind storms. But does this take into account the fact that the soil is wetted and dried over the year? Does this have an effect on its mobility?*

The requested information regarding soils and references was discussed in the draft Staff Report for this TMDL. Much of this information is detailed in our response below, with further clarification of our analysis. The requested soil reference is at the bottom of Table 10 of the "Source Analysis" chapter, on page 18:

> "Zimmerman, R.P. 1981. Soil Conservation Service Soil Survey of Imperial County, California, Imperial Valley Area. United States Department of Agriculture."

We also concur with you that the soil type indicates that it would be less likely to be moved by wind storms, due to the cohesive nature of the soil type. Wet soil is likely to be more cohesive than dry soil. However, dry soil of this type is still relatively cohesive, compared to other soil types.

Additionally, evidence (Schade 2002) from Owens Lake (another saline inland California lake with no outflow that saw significant size reduction due to water diversion) showed that as salt water evaporates, salt deposits were left behind that formed a salt crust. The type of salt crust that formed was dependent on weather. If the salt crust formed during warm weather, the salt crystals cemented the soil particles together to form a hard, wind-resistant surface. If the salt crust formed during cold weather, the crust was soft and subject to wind erosion, resulting in the

largest dust storms in the United States. The project area for the proposed TMDL is located in a desert climate, where warm weather is predominant throughout the year.

A potential health risk due to air quality problems caused by water diversion is a real threat (Schade 2002). Mitigation measures (shallow flooding, managed vegetation, and gravel blanket) are available to reduce dust emissions due to water diversion—responsible parties in the Quantification Settlement Agreement will be responsible for the environmental consequences of their project. The proposed TMDL will not reduce irrigation water flow. Rather, the proposed TMDL will reduce the amount of silt/sediment transported by irrigation water flow. Please see our response to Comment 3B for further discussion of wind-borne soil.

3E *Specific question – The statement is made (p. 21) that the climate is not very changeable in the area. I assume that refers to the fact that there aren't many storms carrying water in the region. But there are large shifts in temperature both diurnally and seasonally. Looked at from that perspective, should there be more discussion about the climate in the analysis?*

Yes, the statement that climate is not very changeable in the area refers to the fact that there are not many water-carrying storms in the region. The proposed TMDL is concerned with reducing the amount of sediment that enters the Imperial Valley drains, to meet water quality objectives and protect beneficial uses. As stated in the Staff Report for this TMDL, the vast majority of sediment entering the drains is carried there by water (specifically, agricultural tailwater).

We concur that large shifts exist regarding diurnal and seasonal temperatures. However, this type of climatic condition has a much weaker effect on conducting sediment into drains, as compared to other climatic conditions such as storm water. Therefore, emphasis in the climate discussion was placed on storm events. The annual average amount of water used in the Valley has remained consistent for the last 10 years, in spite of temperature changes. Therefore, water-related climatic conditions are the climatic conditions of most concern. Accordingly, we believe the analysis provided in the draft Staff Report for this TMDL is more than sufficient for CEQA purposes.

3F *Specific question – There is mention of a Redlands Institute assessment of the effectiveness of MPs (p. 31). When will this be available? When it is, we would very much appreciate receiving a copy (electronically would be fine).*

The Redlands Institute assessment report likely will become available at the end of June. This assessment is being conducted under a state contract. We will send you a copy when the report becomes available.

3G *Specific question – On p. 34, it is mentioned that the Imperial Irrigation District was supposed to submit a Drain Water Quality Improvement Plan (DWQIP) to the Board by September 28, 2003. Did the District submit the plan and if so, what stage of review is it in?*

Yes, the Imperial Irrigation District submitted a DWQIP to the Regional Board, and the Board has approved it.

Letter 4: United States Fish and Wildlife Service

4A *California Environmental Quality Act (CEQA) Environmental Checklist and Determination, page 27, paragraph 3 – The document acknowledges that reductions in tailwater associated with TMDL implementation may increase contaminant concentrations in the surface drains, but it goes on to conclude that significant impacts on water quality (i.e., significant increases in pollutant concentration in the subject drains) are unlikely as a result of implementing the proposed TMDL. This conclusion is not supported as presented. It would be helpful to have an estimate of the reduction in tailwater that is anticipated with the implementation of the TMDL to have a sense of the magnitude of the concentrations changes that may occur. A lack of significance is not based solely on the fact that water quality standards will be exceeded in either case; higher concentrations of constituents such as selenium increase the risk of impacts, particularly at concentrations that already exceed the water quality criterion for chronic effects.*

The most affordable, effective, and locally accepted Management Practices (MPs) for sediment reduction in the Imperial Valley are structural MPs that are not expected to reduce tailwater volume at all. The likely MPs for this TMDL are the same as those already being implemented for the Alamo River and New River, where Regional Board monitoring data shows no measurable flow reduction due to these MPs. This is because the implemented MPs are designed to slow water velocity (thereby reducing erosion) as opposed to applying less water or recycling water through pumpback systems. The implemented MPs include such structural changes as redesigning V-ditches into pan ditches, land leveling, and fixing of tailwater boxes, among others. It is very likely that responsible parties will implement the same MPs for this TMDL as were implemented for the Alamo River and New River TMDLs, due to similar farming practices, field ownership, topography, and recommendation by the Imperial Valley Sedimentation/Siltation TMDL Technical Advisory Committee (a group composed of private and government stakeholder groups).

However, because the Regional Board cannot prescribe actions to be undertaken (pursuant to California Water Code 13360), responsible parties could implement other non-listed MPs, so long as law does not prohibit the MPs. Our CEQA analysis considers and discusses that possibility and its related impacts, and hence acknowledges a potential for tailwater reduction and thus a potential for increased contaminant concentrations (particularly selenium).

As stated in your comment, an estimate of tailwater reduction was not quantified. This is because the U.S. Department of Agriculture made narrative, not quantitative, determinations of the effects of MPs. These determinations are "subjective and somewhat dependent on variables such as climate, terrain, soil, etc." (US. Department of Agriculture 1996). Quantitative estimations of anticipated tailwater reduction are not possible to accurately determine under such variable conditions. However, the U.S. Department of Agriculture and the Regional Board are confident that the narrative determinations are accurate.

As required by CEQA, our analysis identifies and assesses reasonably foreseeable actions (i.e., likely MPs) to be implemented by responsible parties as a result of the proposed project. Our analysis shows that potential tailwater reduction is insignificant because the MPs likely to be implemented for this TMDL (and already being implemented for the Alamo River and New River TMDLs) do not involve tailwater reduction. Therefore, significant impacts on water quality (i.e.,

significant increases in pollutant concentration in the subject drains) are unlikely as a result of implementing the proposed TMDL.

Additionally, the TMDL requires monitoring of implemented MPs and water quality. As monitoring data becomes available, Regional Board staff will evaluate the degree to which unlikely MPs are implemented, potential tailwater reduction, and effects on pollutant concentrations for the subject drains. The TMDL will be revised accordingly if necessary.

4B *CEQA Environmental Checklist and Determination, page 28, Table 4 – As discussed above (Comment 4A), please define the tailwater volume reductions that are considered to be negligible and minor.*

The potential for tailwater reduction for MPs likely to be implemented is presented in Table 4 of the CEQA Environmental Checklist and Determination. These MPs were assessed to have a negligible to minor impact, based on Jones and Stokes Associates 1996 (MPs likely to be implemented) and U.S. Department of Agriculture 1996 (potential for tailwater flow reduction). Please see the response to Comment 4A for further discussion of expected tailwater reduction.

4C *CEQA Environmental Checklist and Determination, page 29, paragraph 2 – These mitigation measures address the direct impacts of silt/sediment suspension in the drain, but they do not address the indirect effects that TMDL implementation may have on resources using the drains through increases in contaminant concentrations (particularly selenium).*

Please see the response to Comment 4A and 4B for further discussion of expected increases in contaminant concentrations (particularly selenium) and expected tailwater reduction.

4D *Natural Environment Study, page 18, Table 4 – It is not clear how this study can conclude that there is no potential for impacts to desert pupfish (Cyprinodon macularius) when the CEQA Checklist acknowledges that contaminant concentrations may increase as a result of TMDL implementation. Yuma clapper rails (Rallus longirostris yumanensis), to the extent that conditions in these drains would support their use, may be affected by increases in contaminant concentrations as well.*

Contaminant concentrations are very unlikely to increase as a result of implementation, because responsible parties are most likely to implement MPs that do not affect tailwater volume, due to cost. (Please see the response to Comment 4A and 4B for further discussion of expected increases in contaminant concentrations, particularly selenium, and expected tailwater reduction.) Rather, the proposed project expects to improve water quality conditions by reducing the amount of sediment/silt (but not water) that runs off of agricultural fields into the drain system. All listed species in the drain system will not be impacted by, or actually will benefit from, reduced sedimentation/siltation. The Desert pupfish specifically will benefit from reduced sedimentation/siltation.

Letter 5: Imperial Irrigation District

5A *In Appendix B, page B-6, the calculated irrigation return flow ratio for the Pumice Drain indicates that 80% of the irrigation water delivered to farmland in the Pumice service area was discharged into the drain. The flow calculations that were used to determine this ratio must be in error. An Imperial Valley water use efficiency report prepared by the NRCE in March, 2002, determined that the combined flow of tailwater and tilewater that is discharged to a drain averages 30.2% of the water delivered. Since the Pumice Drain is not gauged, calculations used in the draft TMDL attempt to determine the drain flow based upon water deliveries to farmland serviced by the Pumice Drain and flows from other Imperial Valley drains that are gauged. If this method is to be used correctly, the calculated drain flows should be approximately 30% of the water delivery rather than 80%.*

Thank you for informing us of our editorial error. We concur that an error occurred in our calculation, and we have corrected it. We will edit the revised Staff Report for this TMDL to reflect the more accurate figure (calculated) of 33%, instead of 80%, for the Pumice Drain. This is very similar to the drain average of 30.2% figure in the NRCE March 2002 report that you quoted. Therefore, we also will edit the load allocations in the revised Staff Report for this TMDL, to reflect the change made for the Pumice Drain.

5B *The draft TMDL states that it will apply to three Imperial Valley drains (Niland 2, P, and Pumice) and their tributary drains (Vail 4A, Vail 4, Vail 3A, Vail 3, and Vail 2A). What is the justification for incorporating a sedimentation/siltation Implementation Plan into the Basin Plan for all Imperial Valley drains if only the Niland 2, P, Pumice, and their tributary drains warrant the development of a TMDL?*

Sediment-indicator (total suspended solids and turbidity) monitoring data on Imperial Valley drains is limited. However, Regional Board data collected in 2002 indicated that Niland 2, P, and Pumice drains were impaired by excess sediment in violation of water quality objectives. Other drains did not show sediment-caused impairment at that time, but could be in violation of water quality objectives if sampled over a longer period of time or in different seasons, especially because farming practices along these drains that empty directly into the Salton Sea are not substantially different than farming practices in the rest of Imperial Valley. Previous Imperial Valley sedimentation/siltation TMDLs (i.e., Alamo River and New River) showed excess sedimentation problems in other parts of the Valley.

Adoption of this TMDL will bring the entire Imperial Valley into compliance with a uniform Implementation Plan to control excess sediment. A total of 80% of all Imperial Valley drains already are under such an Implementation Plan. (The approved Alamo River Sedimentation/Siltation TMDL includes an Implementation Plan applicable to the Alamo River and 900 miles of drains that empty into it. Similarly, the approved New River Sedimentation/Siltation TMDL includes an Implementation Plan applicable to the New River and 400 miles of drains that empty into it.) The Regional Board prefers that the entire Imperial Valley be under the same Implementation Plan, including the Valley's remaining 400 miles of drains (20% of all drains in the Imperial Valley) that empty directly into the Salton Sea. These drains account for a relatively small fraction (20%) of drains in the entire Imperial Valley.

5C *The requirements of the Revised Drain Water Quality Improvement Plan (Revised DWQIP) as detailed in the draft TMDL's Implementation Plan are very disconcerting. In the spirit of cooperation with the Regional Board, the IID submitted a comprehensive Revised DWQIP and Quality Assurance Project Plan for the Alamo River Sedimentation/ Siltation TMDL in September, 2003 that was to fulfill the requirements of the Alamo River TMDL, as well as the upcoming silt TMDLs for the New River and Imperial Valley drains. This draft TMDL does not incorporate several of the compromises that were agreed upon by the IID and Regional Board in the process of developing these plans and their subsequent approval by the Regional Board. The draft TMDL also specifies seasonal drain maintenance restrictions, habitat impact monitoring, and sampling for constituents such as selenium, total organic carbon, persistent pesticides (e.g. DDT and metabolites), pesticides applied by irrigation practices, pesticides used as pre-emergents and post-emergents by crop and season, and pesticides used for drain and channel weed control (e.g. diuron) which are additional requirements that were not included in the agreement, nor were they listed in our previous sedimentation/siltation TMDLs. We are hopeful that these inconsistencies are simply due to an oversight that will be addressed and corrected before the final TMDL is approved.*

We will revise the Staff Report so that it is consistent with the approved DWQIP and accompanying Quality Assurance Project Plan (QAPP) for Imperial Valley watersheds.

Letter 6: Al Kalin

6A *AREA COVERED - This TMDL covers only the Niland 2, P, and Pumice Drains and disregards all other drains that drain directly into the Salton Sea. This, in effect, means there is no Sedimentation/Siltation TMDL for any of the other IID maintained drains draining into the Salton Sea even though farm plans from growers in these other drains have been submitted to Regional Board by the Imperial County Farm Bureau. I would suggest that all drains draining into the Salton Sea should be covered by this TMDL and perhaps only the Niland 2, P, and Pumice Drains should be monitored.*

The proposed TMDL establishes load allocations only for the Niland 2, P, and Pumice drains based on available field data (i.e., we do not yet have sufficient data to establish load allocations for the other drains). However, because all of the drains contribute, albeit in varying degrees, to sediment/silt impacts on water quality standards of the drains and the Salton Sea, and are so listed pursuant to Section 303(d) of the Clean Water Act, the TMDL Implementation Plan establishes a sediment control program applicable to *all* Imperial Valley drains. This approach ensures Valley-wide consistency in controlling sediment in all drains that empty into the Salton Sea, prevents a piecemeal approach in controlling sediment, and will enable us to de-list all of the drains simultaneously upon successful completion of the control measures.

6B *Page 9 Last Paragraph* – Q*uote: "The pesticide dicofol, currently in use in the Imperial Valley, contains DDT and may contribute DDT metabolites to Imperial Valley." Dicofol, (1,1-bis (p-chlorophenyl)-2,2,2-trichloroethanol), trade name, Kelthane does not show DDT as an active ingredient on it's label. Are you sure this statement is correct? Stating that a chemical MAY contribute DDT metabolites does not sound very scientific. The same statement could also be made of a plastic milk jug. This is poor science and has no place in a scientific document. Statements such as this should be reserved for newspaper articles and environmental websites.*

Comment noted. We will edit the Staff Report for this TMDL by deleting the one sentence that mentions dicofol, as quoted in your comment. The U.S. Environmental Protection Agency temporarily canceled dicofol use in 1986 because relatively high levels of DDT (an intermediate product) were in the final product. However, modern dicofol manufacturing processes produce less than 0.1% DDT (EXTOXNET 1996; Pesticide News 1999). Dicofol is not believed to be a significant source of DDT or its metabolites.

The focus of this section of the TMDL is to discuss that DDT and its metabolites still are present at high levels in Imperial Valley from DDT usage prior to the 1973 ban, as evidenced by maximum Total DDT concentrations in fish tissue (State Water Resources Control Board 1978-1995). As stated in the draft Staff Report for this TMDL, DDT and its metabolites have a propensity to attach to negatively-charged clay-rich sediments, like those in Imperial Valley. Therefore, sediment-laden agricultural runoff serves as the transport mechanism by which DDT compounds adhering to soil are introduced to the drain water system.

6C *Page 11 2nd Paragraph – Quote: "Toxaphene has a half-life of up to 14 years." If table 6 and Table 7 use information that is 26 years old, as stated, is Toxaphene in fish tissue still exceeding any federal or state levels given results from 26 years ago would now be reduced to almost 25% of what they were 26 years ago in 1978?*

Table 6 and Table 7 display information that is a compilation of data from 1978 through 1996, not data solely from 1978 (State Water Resources Control Board 1978-1996). Yes, the data indicate that toxaphene still exceeds standards. As stated in the draft Staff Report for this TMDL, the Imperial Valley has the highest maximum toxaphene concentration (in fish tissue) in the Colorado River Basin Region. Toxaphene, like DDT, is an organochlorine chemical with low water solubility, a propensity to attach to soil particles, and a tendency to bioaccumulate in fish and wildlife. Toxaphene has high chronic toxicity to aquatic life (e.g., it is very toxic in low amounts), is a recognized Proposition 65 carcinogen, and has been banned by USEPA since 1983. High toxaphene levels currently remain a problem in the Imperial Valley.

6D *Page 16 Load from Natural Sources (in-steam erosion and wind erosion) - I have brought up the fact to Regional Board Staff numerous times that fish, in particular, Carp, create a tremendous amount of silt in the drains of Imperial Valley. Their method of feeding creates silt as well as does their movement through shallow water when alarmed. I have personally tested the turbidity of drain water in the Trifolium 1 Drain on the west side of Unit 1 of the Sonny Bono Salton Sea National Wildlife Refuge. Using grab samples the turbidity reading of the drain water where the carp were not actively feeding was 45 NTU while below the area where the carp were actively feeding the drain water had a reading of 475 NTU, over ten times greater.*

The sediment/silt contribution from natural sources, including wildlife (e.g., fish) and erosion among others, was factored into the TMDL. We will edit the Staff Report for this TMDL to make this explicitly clear.

6E *Page 16 Load from Potential (Calculated) Storm Event Runoff from Farm Land - Recent rain events during March and the first week of April, 2004 have created large amounts of silt to wash into the drains. Your method of calculating the runoff is flawed in that it does*

not consider the ponding of water along the IID drains which eventually may find a way into the IID drains creating a washout which moves large quantities of soil into the IID drains. Much of this water runs off county roads and finds its way into the drain system through major washouts.

In addition, storm events cause the rivers and drains to reach flood stages. As the water levels rise they increase the amount of erosion in the channel causing major sloughing of the drain banks and river channels.

The sediment/silt contribution from rain events was factored into the TMDL. The methods for calculating sedimentation/siltation loads caused by storm event runoff are the same for this proposed TMDL as those used for the approved Alamo River and New River Sedimentation/Siltation TMDLs. These results were peer reviewed for all three Imperial Valley sedimentation/siltation TMDLs. Even in a worst-case scenario, the amount of storm event runoff from farm land is minimal in comparison to sedimentation/siltation caused by agricultural tailwater.

6F *Page 16 Agricultural Tailwater, First paragraph - Last sentence should be changed to read: Tailwater tends to erode a field after exiting the crop at the end of the field and begins its journey towards the field's drain box. The faster it goes the more silt and sediment it picks up.*

We concur, and will edit the Staff Report for this TMDL accordingly.

6G *Rain is a cause of washouts and erosion. Picture submitted, with caption: "March/April, 2004 rains caused water to run off Kalin Road and pool next to IID drain until water found paths into the drain causing massive washouts and large amounts of soil to enter the drain." Picture submitted, with caption: "March/April, 2004 rains caused Alamo River to run at flood stage. View from Sinclair Road Bridge. High water is seen backed up into Alamo feeder drain. Major bank sloughing occurred adding silt."*

Please see the response to Comment 6E.

6H *Best Management Practices – Issue: Load from Washouts into IID Drains caused by Pocket Gophers. Pocket gophers tunnel from the farmer's fields into the IID drains causing numerous washouts along the bank between the farmer's field and the IID drain. These washouts deposit tremendous amounts of soil into the IID drains. A typical washout will require from 100 to 300 cubic yards of soil (100 to 300 tons) to repair the ditch bank and should be listed as a major source of silt entering the IID drains. In addition, Pocket Gopher control should be a listed Best Management Practice. Picture submitted, with caption: "A typical washout caused by a pocket gopher tunneling from a field being irrigated under the road and into an IID drain ditch. This particular washout required 450 yards (tons) of soil to repair. The majority of the 450 yards of soil was washed down the IID Drain as the washout occurred."*

The sediment/silt contribution from natural sources, including wildlife among others, was factored into the TMDL. We will edit the Staff Report for this TMDL to make this explicitly clear. Regarding gopher control as a Management Practice, please see the response to Comment 6P.

6I *Page 21, LOCAL WATER FLOW - The Imperial Valley drains are owned by the farmers but maintained by the IID.*

You are partly correct. Imperial Valley drains ownership is held mainly by private landowners. However, the Imperial Irrigation District (IID), in addition to operating and maintaining the drainage system, also owns farmland in the Valley (e.g., the recently purchased 40,000 acres of agricultural land). We will edit the Staff Report for this TMDL to more accurately reflect this information.

6J *Page 25, WATER TRANSFER PROPOSALS - The Colorado River Quantification Settlement Agreement will result in excess of 500,000 acre feet per year during some years of the agreement. That, coupled with the Department of Interior demanding that Imperial Valley farmers become more efficient to keep 417 proceedings from happening will require much more efficient use of irrigation water. It is assumed that in 25 years drain water will be greatly reduced to less than 5%. This will drastically reduce the amount of drainwater in the IID drains.*

Thank you for your comment.

6K *Page 27 Imperial County Farm Bureau - The 1st Bulleted item states: "provision of demonstration sites for MP field testing". The major purpose of the Imperial County Farm Bureau (ICFB) is to provide a complete grass roots educational program to make farmers aware of the TMDL process and educate them on how to reduce the amount of silt leaving their fields. Secondly, the ICFB maintains a website where farmers can upload and refresh the farm plan information for each of their fields. This information becomes instantly available to Regional Board staff. In addition the ICFB provides an on-farm consultant who assists farmers, landowners, IID, and Regional Board staff in the implementation of the TMDL.*

The ICFB does not provide demonstration sites for MP field testing.

You are correct. The Staff Report will be revised accordingly.

6L *Page 27, MANAGEMENT PRACTICES - I see no reason to change from the term BMP to MP to appease bureaucrats. It only confuses the educational process. There should be no confusion that "a BMP infers that the practice is the most effective option in all circumstances" if a thorough explanation is given in each TMDL. To change in mid-stream would only muddy the waters and cause further confusion, especially to farmers who will be working with the phrase the most. In trying to be politically correct you are confusing the farmers who will use the term the most.*

The term for Management Practices (MPs) was changed to become consistent with wording in the Nonpoint Source Pollution Control Program. "Management Practices" is the term recommended for use by the State Board, and we will use this term from now on. The Imperial County Farm Bureau and farmers/landowners may use whatever term they feel is best for outreach and educational purposes.

6M *Page 27, On-field Sediment-Control MPs - The bulleted items, "Maintenance of Field Drainage Structure (Imperial Irrigation Regulations No. 39)" and "Tailwater Drop Box with Raised Grade Board" are redundant and both items address the very same thing.*

You are correct. The Staff Report will be revised accordingly.

6N *Page 28, "Pan Ditch" – Enlarged Tailwater Ditch Cross Section - This does not involve deepening a tailwater ditch. Instead it involves widening a tailwater ditch and making it very shallow so that the drainwater will flow over a much larger, shallow area which will reduce the velocity of the water. The second to the last sentence in the paragraph about Pan Ditches should read: The slower the velocity the less silt will be picked up by the moving water. A slower velocity will allow the heavier particles of silt to settle out more easily.*

Thank you for this information. We concur with your description of this practice, and concur that the sentence is confusing as written in the draft Staff Report for this TMDL. We will edit the Staff Report for this TMDL to make the sentence clearer.

6O *Page 28, Field to Tailditch Transition - Fiber mats should be added as a material that spillways might be constructed from.*

We concur that fiber mats are an acceptable material to use for constructing spillways. The Imperial Valley Sedimentation/Siltation TMDL Technical Advisory Committee (Silt TMDL TAC) recommended the wording used in the draft Staff Report for this TMDL. The description of this MP is a summary, and not prescriptive. Rather, the list of materials serves as a suggestion. California law prohibits the Regional Board from specifying design, location, type of construction, or particular manner in which compliance may be achieved, pursuant to California Water Code 13360. Hence, responsible parties are allowed to use materials other than those suggested in the draft Staff Report for the TMDL, including fiber mats, so long as law does not prohibit the MPs. We will edit the revised Staff Report for this TMDL to make this clearer.

6P *Issue - Missing Best Management Practices*

Gopher Control to Stop Washouts

The amount of silt entering the IID drains as a result of washouts caused by gophers has not been studied to the level it should have been. Gophers may be one of the primary causes of the total tons of soil washed from farmer's fields yearly. Gopher eradication, gopher walls, and gopher ditches are all items which will reduce the amount of gophers working along the IID drains.

Planting in the Mulch

Planting in the mulch requires the field to first be irrigated to charge the soil with sufficient moisture to germinate any weeds and have enough moisture left over to germinate the seed which is planted, commonly wheat. The IID does not allow drain water during the mulching irrigation. This stops all silt from leaving a recently cultivated field during the pre-mulch irrigation. After the weeds come up the soil is worked very shallow to kill the weeds and create a shallow mulch that rapidly dries out and acts as an

insulation to stop all further evaporation of moisture. A special planter is then used to place the seed through the dry mulch and into the "mud" below. The seed germinates from the moisture in the "mud" and comes up through the dry mulch. The plant will continue to grow and be close to one foot high before the first surface irrigation is needed. Since the plant is already up with a healthy, vigorous root system, the roots and the shear number of plants act as a "filter" to stop virtually all silt from leaving the field.

Drain Box Erosion Wings
Much erosion happens right at the drain box as the drain water swirls in front of the drain box. By adding erosion barriers (wings) on either side of the drain box erosion around the drain box is eliminated. Erosion wings can be constructed from wood, concrete or even used rubber tires stacked up on either side of the drain box.

Cascading Drain Box
If elevations are right, the drain water from one field can be collected and used in the adjacent field thus reducing the amount of silt leaving the first irrigated field.

PAMs
The use of Polyacrylamides (PAMs) is gaining popularity by farmers as the price of the product becomes less expensive. It should not be excluded as an effective means of reducing the amount of silt leaving the farmer's fields just because it is included in California's Proposition 65 list. I believe chlorine is listed there too but it is still used every day to treat municipal drinking water and its use is very beneficial. The same could be said of PAMs.

Preliminary results show that PAM would significantly reduce the amount of silt moving downstream as the IID cleans the drains ditches.

Pumpback Systems
As more water is transferred and the Department of Interior requires more efficient use of the irrigation water pumpback systems will become very common to reduce erosion. The state is paying to put water into the sea so why exclude Pumpback Systems as a valuable tool to reduce the loss of silt from farmer's fields.

Level Basin Irrigation
Level Basin Irrigation is a method of irrigating which produces no drain water just as Sprinkler Irrigation and Drip Irrigation does. The latter two are listed as BMPs. Level Basin Irrigation could also be called Dead Leveling.

Thank you for your comments. Please see our response to Comment 6E regarding sediment/silt from natural sources. Regarding the MPs, the MP list in the TMDL is not a complete list, but rather a list of *suggestions* provided by the Imperial Valley Silt TMDL TAC and University of California Cooperative Extension. The listed MPs are not prescriptive because California law prohibits the Regional Board from specifying design, location, type of construction, or particular manner in which compliance may be achieved, pursuant to California Water Code, Section 13360. Hence, responsible parties are allowed to implement other non-listed MPs, so long as law does not prohibit the MPs. We will edit the revised Staff Report for this TMDL to make this clearer.

6Q *Page 30, Reduced Tillage - I am at a loss as to what the explanation of "Reduced Tillage" means. It makes no sense and contradicts itself. How can weed control increase erosion and sedimentation? Propagation of weeds decreases erosion and sedimentation. Someone needs to find out where this BMP originally came from and what was meant to be said. This needs to be deleted or explained much better so it makes sense.*

We will edit the revised Staff Report for this TMDL to make our wording clearer. We will edit the passage with information from Jones & Stokes Associates (1996), who describe Reduced Tillage as practices that limit use of heavy farm machinery to only the operations required for crop growing and harvesting. The goal is to eliminate one cultivation per crop. Reduced tillage practices include working seed beds only enough to properly plant, avoiding work in wet soil, varying tillage depth from year to year, cultivating only to control weeds, and chiseling when dry to break up plow pans. Such practices minimize erosion and sedimentation that may occur in furrows.

6R *Page 34, The revised DWQIP must consist of: Representative water…… - I believe it is unreasonable to ask the IID to test for selenium, total organic carbon, nutrients, persistent pesticides, pesticides applied by irrigation practices, pesticides used as pre-emergents and post-emergents by crop and season, and pesticides used for drain and channel weed control. These are best left for pesticide and selenium TMDLs. California is the most strictly regulated state in the Union when it comes to application of pesticides. Furthermore Imperial County is one of the most strictly regulated counties in the State of California. Everything we apply to our fields is permitted and applied in the correct fashion, primarily by custom applicators or chemical companies. The cost of this additional testing would have to be paid for by the farmers in the form of increased water charges when it probably isn't even necessary. Are not all pesticide and selenium levels in the Salton Sea within state and federal tolerances already?*

We will revise the Staff Report for this TMDL so that its requirements are consistent with the approved IID Revised Drain Water Quality Improvement Plan (DWQIP). Regarding Salton Sea selenium and pesticide levels, the Salton Sea is listed on California's Clean Water Act Section 303(d) List as impaired by selenium. The Sea is currently not listed as impaired for pesticides.

6S *Page 37, Interim Numeric Targets, Table 14 - We need to stick with the same reductions as set forth in the New River and Alamo Silt TMDL. Changing the rules for different parts of the valley, in midstream, will only infuriate the farmers and negatively affect the credibility of the Regional Water Quality Control Board. When we started this program the farmers did not trust you. Most still don't but some have changed their minds with the grass roots educational programs developed by the ICFB. If you change these Interim Numeric Targets I believe you will create dissention and loose much more than what you would gain by this small change. Fairness needs to be the key element in dealing with the farmers.*

We will edit the Staff Report for this TMDL to adjust the interim numeric target schedule and accompanying text, as described below, to make the proposed TMDL better fit the approved Alamo River and New River schedules. Deletions are denoted with strikethrough text. Additions are denoted with underlined text.

The Regional Board's goal is attainment of TMDL allocations by the year ~~2013~~ 2015. The proposed implementation plan occurs in four phases. This schedule is synchronous with the last three phases of the implementation schedule for the Alamo River and New River Sedimentation/ Siltation TMDLs.

Table 14: IV Drains Interim Numeric Targets

Phase	Time Period	Estimated Reduction*	Interim Target (mg/L)
Phase 1	~~2004~~ 2005 through 2006 ~~(Year 1)~~	~~20%~~ 10%	~~334~~ 376
Phase 2	~~2005 through 2007~~ 2007 through 2009 ~~(Years 2 – 4)~~	25%	~~251~~ 282
Phase 3	~~2008 through 2010~~ 2010 through 2012 ~~(Years 5 – 7)~~	~~15%~~ 20%	~~213~~ 226
Phase 4	~~2011 through 2013~~ 2013 through 2015 ~~(Years 8 – 10)~~	~~6%~~ 12%	200

* Percent reductions indicate the reduction required in TSS at the ~~beginning~~ end of each phase, starting with the current (2002) average concentration of 418 mg/L.

The end target of 200 mg/L TSS is the same for all three sedimentation/siltation TMDLs in the Imperial Valley. The interim numeric targets differ between the Alamo River, New River, and Imperial Valley Drains TMDLs because the starting TSS level is different for all three TMDLs. (The starting TSS level was 418 mg/L for the Imperial Valley Drains, 377 mg/L for the Alamo River, and 241 mg/L for the New River.) Therefore, the percentage reductions and interim numeric targets differ between this proposed TMDL and the previous TMDLs.

6T *Page 38, I. MEASURES OF SUCCESS, AND FAILURE SCENARIOS, Failure Scenarios - The 2nd and 4th sentences seem to say exactly the same thing. There must be a mistake here.*

We will edit the revised Staff Report for this TMDL to make this point clearer. Deletions are denoted with strikethrough text. Additions are denoted with underlined text.

> "Two failure scenarios exist regarding TMDL implementation. The first is failing to meet ~~water quality improvement goals (~~interim numeric targets and corresponding load allocations even though MPs were implemented widely in the project area.~~) coupled with *achievement* of implementation milestones.~~ If this scenario materializes, MPs and interim targets will be re-evaluated and adjusted. The second failure scenario involves failure to meet ~~water quality improvement goals (~~interim numeric targets and corresponding load allocations because MPs were *not* implemented widely in the project area.~~) coupled with *failure* to achieve~~

~~implementation milestones.~~ If this scenario materializes, the Regional Board shall consider more stringent regulatory mechanisms."

6U COMMENT: *Page 39, Table 15 - Why is there a different timetable from the other silt TMDLs?*

As stated in the draft Staff Report for this TMDL, the first TMDL review is scheduled to conclude three years after TMDL approval to provide adequate time for implementation and data collection. Therefore, the timetable is different from other sedimentation/siltation TMDLs because each TMDL was approved in a different year. As stated in the draft Staff Report, subsequent reviews will be conducted concurrently with the Basin Plan Triennial Review. Therefore, eventually all of the sedimentation/siltation TMDLs will be on the same review schedule.

6V *Page 43, ECONOMIC IMPACT ASSESSMENT - The cost of the Silt TMDL is stated as a percentage of total production costs. It would be much more appropriate to state this cost as reduction of net income using the University of California Local Extension Service costs for growing crops as well as the Imperial Country Ag Commissioner's figures of income for growing costs. Listing the percentage reduction in net income is much more meaningful than using the increase of total production costs.*

The method used (i.e., percentage of total production costs) for this proposed TMDL is the same as was used for the approved Alamo River and New River Sedimentation/Siltation TMDLs. Costs were estimated appropriately. Percentage reduction of net income, and income for growing costs, were not selected because data sources for these methods are too inconsistent for accurate cost comparisons.

Production costs were used as the basis for cost comparison because in any agricultural production budget, long term profits and costs become incorporated into the value of the land itself. As profits increase over a period of years, land becomes more valuable, and as profits decrease land value is reduced. Rental price is directly related to the expected profit derived from farming of the land.

Any long-term change in expected profitability of a business enterprise is reflected first in the rental price of land, and over a period of years, in the purchase price of the land, and over a longer period, in the county's appraised value of land. Therefore, a new additional long-term cost to the farm operator, whether owner or renter, results in a proportional decrease in land value, land rents, and ultimately is reflected in reduced property tax revenue to the County. Likewise, a long-term contract to sell unused water will result in an immediate increase in the value of the land.

Net returns must be derived by using consistent data sources. The perfect data source is the farmer, who often is reluctant to share information. In California, an alternative source for agricultural production costs is available from the University of California's Cooperative Extension (UCCE). Estimated crop yields and average market price are developed by each county's Agricultural Commissioner's office, and published annually as the County Crop Report. The two data sources are entirely different, and were never intended to be used in direct comparison. UCCE crop budgets typically overestimate costs by 10-15%, and Agricultural

Commissioner reports tend to underestimate per-acre revenues. Direct comparison of these inconsistent data sources results in an artificially low calculated profit.

6W *NATURAL ENVIRONMENTAL STUDY, PAGE 13 - The second paragraph states: In border irrigation, siphon tubes or spiles then discharge….. Siphon tubes or spiles, (furrow pipes), are not used for border irrigation. The water exits the ditch and into each border strip through a 12" to 14" pipe which is regulated by a metal slide.*

We concur and will edit the Staff Report for this TMDL to reflect this.

6X *IMPERIAL VALLEY DRAINS SILT TMDL: ECONOMIC IMPACT ASSESSMENT - SUMMARY – Second to the last sentence: The high cost scenario assumes the installation of sediment ponds or synthetic fiber strips…… - I believe it should read: natural fiber strips since the fiber mat is made of either wheat, rice, or coconut fibers.*

We concur and will edit the Economic Impact Assessment to reflect this. Only natural fiber strips were evaluated in this study.

6Y *IMPERIAL VALLEY DRAINS SILT TMDL: ECONOMIC IMPACT ASSESSMENT - PAGE 3 – TOP OF PAGE - Add item number 9. Slope of the ground*

We concur and will edit the Economic Impact Assessment for this TMDL to include this information.

6Z *IMPERIAL VALLEY DRAINS SILT TMDL: ECONOMIC IMPACT ASSESSMENT - PAGE 5 – Table 2 Costs of Sediment Retention Management Practices - Costs are listed for 40, 60, 80, and 160 acre fields. These are gross acres not net farmable acres. The true cost would be if figured for 35, 55, 70, and 140 acre fields.*

Thank you for your comment. The Economic Impact Assessment was conducted under established procedures with the best available information. The amount of Imperial Valley acreage used for infrastructure was not available for each field, and may vary between crops and landowners. A 12.5% loss to infrastructure (as suggested in your comment) may be high on the average. Some growers in the San Joaquin Valley use about 5% of land for infrastructure. These figures are reasonable and appropriate.

6AA *IMPERIAL VALLEY DRAINS SILT TMDL: ECONOMIC IMPACT ASSESSMENT - PAGE 6 – Second paragraph, second to last sentence. The wildlife habitat is not subject to high silt production because of the intensive ground cover and the unexposed soil. - This is a false statement made by someone not familiar with wildlife habitat. With the exception of Yuma Clapper Rail habitat, which is composed of dense cat-tails, the shallow open ponds of water serve as roosting, watering, and feeding grounds for migrating waterfowl. These birds stir up the mud to very high turbidity levels. One only has to see the effects of 30,000 snow geese watering and feeding in a shallow pond to understand how things really are. I have managed duck clubs for many years. It is amazing how muddy the ponds are each morning after the ducks and geese, which use*

the open water to roost during the night, leave every morning to feed in the fields. The type of ducks that inhabit shallow water ponds are known as puddling ducks or dabbling ducks because they puddle and dabble. Both words suggest the increase in turbidity which is the case.

Thank you for your comment. This sentence does not refer to wildlife habitat in general. Rather, "wildlife habitat" in this sentence refers to the State refuge mentioned in the previous sentence of the draft Economic Impact Assessment for this TMDL. Both of these sentences have been bolded and italicized below, and are shown in the context of their paragraph:

> "Drainage costs for the Niland 2 Drain were estimated to range between $20,787 and $3,789 for the 1,675 irrigated acres being drained. High average drainage costs for the Drain is $12.41 per acre which is considerably lower than the $20.10 per acre presented in Table 2. ***The lower average cost is due to the practices that would be required in the 737 acre wildlife habitat area owned by the State of California. The wildlife habitat is not subject to high silt production because of the intensive ground cover and the unexposed soil.*** Therefore they will not require sediment ponds or expensive filter strips to achieve the objectives of the TMDL. The low average drainage costs is $2.20 per acre."

The specific "wildlife habitat" mentioned is State refuge land that has grass cover and unexposed soil. Hence, this specific wildlife habitat is not subject to high silt production because, though this land can still produce runoff sediment/silt under certain circumstances, this land contributes far less sediment/silt than cultivated crop fields.

6BB *IMPERIAL VALLEY DRAINS SILT TMDL: ECONOMIC IMPACT ASSESSMENT - PAGES 7-12 The use of landowners names - I see no positive reason for listing the landowner's names in this TMDL. It will only serve to excite the owners and serves no purpose. You need to remove their names. In addition I feel many of the maps with landowner's names are incorrect and shows them owning land in the wrong place. In addition the IID and Sonny Bono National Wildlife Refuge property seems to be missing. The State of California and FWS have current farm plans for their properties already in place.*

The maps shown were the best available at the time and based on readily available public information. The maps do not disclose compliance or non-compliance.

Letter 7: Imperial County Farm Bureau

7A *Public Review Document Pg. 8 - Why are the P, Pumice and Niland 2 drains the only ones listed for the TMDL when there are several others that drain directly into the Salton Sea?*

The P, Pumice, and Niland 2 drains are the only ones listed for the TMDL because available data shows water quality impairments in those drains. The TMDL's implementation plan, however, applies to all Imperial Valley drains because all of the drains contribute, albeit in varying degrees, to sediment/silt impacts on water quality standards of the drains and the Salton Sea. This approach also ensures consistency Valley-wide.

7B *Public Review Document Pg. 16 - The amount of silt or turbidity that can be stirred up by wildlife was not included in the calculation for the load from natural resources. This can be a significant factor in the loading.*

The sediment/silt contribution from natural sources, including wildlife and rain events among others, was factored into the TMDL. We will edit the Staff Report for this TMDL to make this explicitly clear.

7C *Public Review Document Pg. 16 - The amount of erosion that can occur during and after rain events in the IID drains and rivers was not accurately calculated in the load from potential storm event runoff from farm land.*

Please see the response to Comment 7B.

7D *Public Review Document Pg. 21 - Local Water Flow – Imperial Valley drains are not owned by the IID, they are maintained by the IID and owned by the farmers/landowners.*

You are partly correct. Imperial Valley drains ownership is held mainly by private landowners. However, the Imperial Irrigation District (IID), in addition to operating and maintaining the drainage system, also owns farmland in the Valley (e.g., the recently purchased 40,000 acres of agricultural land). We will edit the Staff Report for this TMDL to more accurately reflect this information.

7E *Public Review Document Pg. 25 - Keep in mind that these flows will most likely be changing (reduced) do to the QSA.*

Thank you for your comment.

7F *Public Review Document Pg. 27 - Why does the term for management practices keep changing? First it was BMP, then it was BMT and now it's MP? This is ridiculous. For the outreach/educational purposes, you need to stick with the original term, BMP to reduce confusion.*

The term for Management Practices (MPs) was changed to become consistent with wording in the Nonpoint Source Pollution Control Program. "Management Practices" is the term recommended for use by the State Board, and we will use this term going forward. The Imperial County Farm Bureau and farmers/landowners may use whatever term they feel is best for outreach and educational purposes.

7G *Public Review Document Pg. 27 - At the top of the page it says that ICFB will provide demonstration sites for MP field – testing. This is incorrect.*

You are correct. The Staff Report will be revised accordingly.

7H *Public Review Document Pg. 27 - The first two MPs listed are essentially the same and therefore redundant and confusing.*

You are correct. The Staff Report will be revised accordingly.

7I *Public Review Document Pg. 28 - Pan Ditch – this practice does not involve the DEEPENING and widening of a tailwater ditch. It actually involved the FLATENING and widening of a tailwater ditch.*

Thank you for this information. The Imperial Valley Sedimentation/Siltation TMDL Technical Advisory Committee (Silt TMDL TAC) recommended the wording used in the draft Staff Report for this TMDL. We will edit the revised Staff Report for this TMDL by removing the word "deepening". We concur that this practice does not involve the deepening of a tailwater ditch. Rather, it involves widening a tailwater ditch and making it very shallow so that drainwater will flow over a larger, shallower area. This serves to reduce water velocity, to reduce the amount of silt picked up by water, and to allow the heavier silt particles to settle out more easily.

7J *Public Review Document Pg. 29 - I don't believe Irrigation Land Leveling is a BMP. In fact, I think it would actually cause more erosion problems. I believe that this should be removed from the list.*

As stated on page 29 of the draft Staff Report for this TMDL, this MP was consistent with recommendations of the Natural Resources Conservation Service (1996), and was assessed by Jones & Stokes Associates (1996) as having a 10% to 50% sediment reduction efficiency with a medium to high cost. Additionally, this MP was extensively discussed by the Imperial Valley Silt TMDL TAC. As stated on page 27 of the draft Staff Report for this TMDL, effectiveness of sediment MPs is dependent on site-specific and crop-specific conditions. Therefore, landowners and operators are the best parties to identify which MPs are most appropriate for them for TMDL attainment. This MP will not be removed.

7K *Public Review Document Pg. 30 - Some very important BMPs not listed that should be include: Gopher Control, Planting in the Mulch, Drain Box Erosion Wings, Cascading Drain Box, Polyacryliamides, Pumpback Systems and Level Basin Irrigation.*

Thank you for your comment. The MP list is not a complete list, but rather a list of *suggestions* provided by the Imperial Valley Silt TMDL TAC and University of California Cooperative Extension. The listed MPs are not prescriptive because California law prohibits the Regional Board from specifying design, location, type of construction, or particular manner in which compliance may be achieved, pursuant to California Water Code, Section 13360. Hence, responsible parties are allowed to implement other non-listed MPs, so long as law does not prohibit the MPs. We will edit the revised Staff Report for this TMDL to make this clearer.

7L *Public Review Document Pg. 31 - In the second line you refer to the Imperial Valley Farm Bureau. It is actually the Imperial COUNTY Farm Bureau.*

You are correct. We will revise the Staff Report to correct this error.

7M *Public Review Document Pg. 33 - Under Approved Self-Determined TMDL Watershed Programs, #4 goal statement, including measurable outcomes or products is not a reasonable request and is very confusing. Isn't the goal to comply with the numbers generated by the TMDL? Isn't the outcome measured by the Regional Board's monitoring program? This should be removed.*

Thank you for your comment. This provision applies only to farmers/landowners who are *not* part of the Imperial County Farm Bureau's Watershed Program. All farmers/landowners have the option of joining the Farm Bureau program, which Regional Board staff advocates so that the process is simpler for individual farmers/landowners and Regional Board staff. Most farmers/landowners are already in the Farm Bureau program, making the process more cost-effective for farmers/landowners (through grants to the Farm Bureau) and Regional Board staff. This is not a new concept, but rather also was part of the Alamo River and New River Sedimentation/Siltation TMDLs.

7N *Public Review Document Pg. 33 - Under Approved Self-Determined TMDL Watershed Programs, #5 – the technical/economic feasibility of MPs should not be required information to be submitted nor should the desired outcome. Isn't the desired outcome obvious – to reduce erosion?*

Please see the response to Comment 7M.

7O *Public Review Document Pg. 33 - Under Approved Self-Determined TMDL Watershed Programs, #6 – there is no reason to have this requirement either. There is no need for a timetable (the plans are good for at least one year so if the farmer lists a BMP, it should be implemented sometime within that year if it hasn't already been implemented), the Regional Board measures the water quality improvement, not the farmers, and the implementation level – what is that? Either it's implemented or it's not.*

Please see the response to Comment 7M.

7P *Public Review Document Pg. 33 - Under Approved Self-Determined TMDL Watershed Programs, #7 – monitoring is not required of the farmers, only the Regional Board and the IID, therefore this should be removed as well. Monitoring for the farmers is voluntary only so that they can see for themselves if a BMP is effective or not. If farmers were required to submit monitoring data, would the Regional Board really accept it from them as legitimate data anyway?*

Please see the response to Comment 7M.

7Q *Public Review Document Pg. 34 - IID Drain Water Quality Improvement Plan – it is absolutely unreasonable to require the IID to test for selenium, total organic carbon, nutrients, persistent pesticides, pesticides applied by irrigation practices, pesticides used as pre-emergents and post-emergents by crop and season and pesticides used for drain and channel weed control. This is a SILT TMDL and therefore they should be*

monitoring for SILT! This monitoring is unnecessary and too costly to burden the IID and its ratepayers, the farmers with. I believe this is where environmental justice should come in. Besides, Imperial County farmers are already very strictly regulated for their pesticide use as is the IID. This was not part of the original agreement made with the IID. If you want the IID and the Farm Bureau to cooperate with the Regional Board, you cannot change the rules after agreements were made. The IID and the farmers have gone above and beyond their call to cooperate with the Regional Board but if the Regional Board cannot be trusted to keep up their end of the deal, that cooperation will disappear and then everyone, especially the environment, loses.

We will revise the Staff Report for this TMDL so that its requirements are consistent with the approved IID Revised Drain Water Quality Improvement Plan (DWQIP).

7R *Public Review Document Pg. 37 - Interim Numeric Targets – these numbers differ from the New River and Alamo River Silt TMDLs. If you want to implement these TMDLs on a valley wide basis, your numbers need to be consistent.*

The end target of 200 mg/L TSS is the same for all three sedimentation/siltation TMDLs in the Imperial Valley. The interim numeric targets differ between the Alamo River, New River, and Imperial Valley Drains TMDLs because the starting TSS level is different for all three TMDLs. (The starting TSS level was 418 mg/L for the Imperial Valley Drains, 377 mg/L for the Alamo River, and 241 mg/L for the New River.) Therefore, the percentage reductions and interim numeric targets differ between this proposed TMDL and the previous TMDLs. Please see our response to Comment 7S for further discussion of interim numeric targets.

7S *Public Review Document Pg. 37 - Your timetable will need to be adjusted. The TMDL has not even been adopted so you cannot require a 20% reduction by the end of 2004. Also, I believe a 20% reduction in the first year is too high. The program should start off gradual and work its way up – not the other way around.*

We concur with you. We will edit the Staff Report for this TMDL to adjust the interim numeric target schedule and accompanying text, as described below. Deletions are denoted with strikethrough text. Additions are denoted with underlined text.

> The Regional Board's goal is attainment of TMDL allocations by the year ~~2013~~ 2015. The proposed implementation plan occurs in four phases. This schedule is synchronous with the last three phases of the implementation schedule for the Alamo River and New River Sedimentation/ Siltation TMDLs.

Table 14: IV Drains Interim Numeric Targets

Phase	Time Period	Estimated Reduction*	Interim Target (mg/L)
Phase 1	~~2004~~ 2005 through 2006 ~~(Year 1)~~	~~20%~~ 10%	~~334~~ 376
Phase 2	~~2005 through 2007~~ 2007 through 2009	25%	~~251~~ 282

Phase	Time Period	Estimated Reduction*	Interim Target (mg/L)
	~~(Years 2 – 4)~~		
Phase 3	~~2008 through 2010~~ 2010 through 2012 ~~(Years 5 – 7)~~	~~15%~~ 20%	~~213~~ 226
Phase 4	~~2011 through 2013~~ 2013 through 2015 ~~(Years 8 – 10)~~	~~6%~~ 12%	200

* Percent reductions indicate the reduction required in TSS at the ~~beginning~~ end of each phase, starting with the current (2002) average concentration of 418 mg/L.

7T *Public Review Document Pg. 39 - Again, this timetable probably needs to be adjusted.*

We concur with you. We will edit the Staff Report for this TMDL to adjust the TMDL review schedule, as described in the table below. Deletions are denoted with strikethrough text. Additions are denoted with underlined text.

Table 15: TMDL Review Schedule*

Activity	Date
Approval	~~2004~~ 2005
Begin First Review	~~August 2004~~ 2007
End Review (Regional Board Public Hearing)	~~April 2005~~ 2008
Submit Administrative Record to State Water Resources Control Board (State Board)	~~May 2005~~ 2008
Begin Second Review	~~July 2006~~ 2010
End Review (Regional Board Public Hearing)	~~June 2007~~ 2011
Submit Administrative Record to State Board	~~July 2007~~ 2011
Begin Third Review	~~July 2009~~ 2013
End Review (Regional Board Public Hearing)	~~June 2010~~ 2014
Submit Administrative Record to State Board	~~July 2010~~ 2014

Etc.	

* Dates are contingent upon Regional Board adoption, State Board approval, and USEPA approval.

7U *Public Review Document Pg. 45 - In the References Cited, you cite the Imperial Valley Farm Bureau – it should be Imperial COUNTY Farm Bureau.*

We agree. We will revise the Staff Report accordingly.

7V *Basin Plan Amendment Pg. 3 - Water contact recreation should not be listed as a beneficial use of the IV Drains as it is ILLEGAL for any person to enter any IID drain.*

We concur that neither landowners nor the IID sanctions water contact recreation. Nevertheless, these are waters of the United States that have been properly designated with existing beneficial uses.

7W *Basin Plan Amendment Pg. 6 - Footnotes for Table No. D-2 - #2 – This statement indicates that the percent reductions in the table must be implemented at the BEGINNING of the phases. Does this mean that by the BEGINNING of phase1, a 20% reduction is required? If so, this is unreasonable.*

We will revise the TMDL to clarify that the goal should be reached by the end of the phase, not the beginning. Interim numeric targets are goals, and may be modified based on new data. Additionally, compliance by responsible parties will not be based on meeting interim numeric targets. Rather, compliance will be based on meeting the load allocation (annual average), derived from the numeric target. The Regional Board's goal is attainment of TMDL allocations by the year 2015. The allocations also may be modified should new data come to light.

7X *Economic Impact Assessment Pg. 3 - The amount of land erosion for an individual field is based on numerous factors, one being the slope of the ground. This should be included in your list.*

Thank you for your comment. We concur that slope of the ground is an important factor in the amount of erosion of a field. We will edit the Economic Impact Assessment for this TMDL to include this information.

7Y *Economic Impact Assessment Pg. 6 - The second paragraph states that "…wildlife habitat is not subject to high silt production because…" This is an incorrect statement.*

Thank you for your comment. This sentence does not refer to wildlife habitat in general. Rather, "wildlife habitat" in this sentence refers to the State refuge mentioned in the previous sentence of the draft Economic Impact Assessment for this TMDL. Both of these sentences have been bolded and italicized below, and are shown in the context of their paragraph:

"Drainage costs for the Niland 2 Drain were estimated to range between $20,787 and $3,789 for the 1,675 irrigated acres being drained. High average drainage costs for the Drain is $12.41 per acre which is considerably lower than the $20.10 per acre presented in Table 2. ***The lower average cost is due to the practices that would be required in the 737 acre wildlife habitat area owned by the State of California. The wildlife habitat is not subject to high silt production because of the intensive ground cover and the unexposed soil.*** Therefore they will not require sediment ponds or expensive filter strips to achieve the objectives of the TMDL. The low average drainage costs is $2.20 per acre."

The specific "wildlife habitat" mentioned is State refuge land that has grass cover and unexposed soil. Hence, this specific wildlife habitat is not subject to high silt production because, though this land can still produce runoff sediment/silt under certain circumstances, this land contributes far less sediment/silt than cultivated crop fields.

7Z *Economic Impact Assessment Pgs. 7-12 - Not only are many of the maps shown incorrect and the Sonny Bono National Wildlife Refuge property conveniently missing, but it is entirely inappropriate to list individual landowner's names. ICFB and the Regional Board agreed to enforce TMDLs on a drain shed basis and keep specific names and properties confidential as long as the drain sheds are in compliance. I am extremely disappointed that this kind of (incorrect) information is included in this TMDL. It should be removed immediately for privacy purposes.*

The maps shown were the best available at the time, and largely are based on information from the Imperial Irrigation District. Land ownership is public information. The maps do not disclose compliance or non-compliance.

Letter 8: Gowan Company

8A *Although the comment period for this subject closed on April 5th, a stakeholder in your area has just contacted us and requested that we provide information in support of the use of dicofol. Therefore, we would like to submit the following for your consideration.*

The Imperial Valley Sedimentation/Siltation TMDL document states: "DDT was used extensively in the Imperial Valley as a low-cost, broad spectrum insecticide. The pesticide dicofol, currently in use in Imperial Valley, contains DDT and may contribute DDT metabolites to Imperial Valley."

The U.S. EPA completed the reregistration of the active ingredient dicofol in 1998. In 1996, the Food Quality Protection Act was passed which radically changed the way that U.S. EPA conducts risk assessments to be much more stringent. EPA's Reregistration Eligibility Document (RED) is available on their website at www.epa.gov. The RED states: "Based on the data reviewed by EPA, dicofol does not present an acute or chronic dietary risk to the U.S. populations at large or any subgroups. This analysis includes the contribution of food and water." Additionally, the RED specifically addresses the concerns of any relationship between DDT and dicofol. The RED states: "Dicofol and DDT are similar in chemical structure. However, important differences in chemistry separate these two organochlorine pesticides. Dicofol has an environmentally significant water solubility, providing dicofol with a pathway for degradation; DDT does not. Dicofol has an environmental half-life of weeks compared to years for DDT. While

dicofol has some ability to accumulate, DDT has a much greater ability to do so. Most importantly, dicofol does not degrade to DDE, but to degradates less toxic than dicofol, whereas DDT degrades to DDE which has been identified as the toxic moiety." In concluding this comparison, the RED states: "It is clear, however, that dicofol does not present the enormous bioaccumulation potential of DDT/DDE and, for that reason alone, may be deemed of lesser concern than DDT/DDE."

Finally, in the ecological risk assessment portion of the RED, EPA concludes that any risks or concerns can be addressed through risk mitigation in the form of label changes that have taken place. These changes reduce the number of applications available and on some crops the amount of product that can be used.

Based on this information, it can be concluded that dicofol, used as amended by the RED in 1998, is safe to humans and the environment. This information should be considered before further mitigation action is taken in California. Dicofol has been and remains a very important tool for Imperial Valley growers.

We appreciate the opportunity to provide this information.

Thank you for the information. The proposed TMDL does not involve regulating dicofol use. We will edit the TMDL by deleting the one sentence that mentions dicofol, as you quoted in your comment.

The U.S. Environmental Protection Agency temporarily canceled dicofol use in 1986 because relatively high levels of DDT (an intermediate product) were in the final product. However, modern dicofol manufacturing processes produce less than 0.1% DDT (EXTOXNET 1996; Pesticide News 1999). Dicofol is not believed to be a significant source of DDT or its metabolites.

The focus of this section of the TMDL is to discuss that DDT and its metabolites still are present at high levels in Imperial Valley from DDT usage prior to the 1973 ban, as evidenced by maximum Total DDT concentrations in fish tissue (State Water Resources Control Board 1978-1995). As stated in the draft Staff Report for this TMDL, DDT and its metabolites have a propensity to attach to negatively-charged clay-rich sediments, like those in Imperial Valley. Therefore, sediment-laden agricultural runoff serves as the transport mechanism by which DDT compounds adhering to soil are introduced to the drain water system.

PEER REVIEW COMMENTS AND RESPONSES

Each Peer Review comment letter received by the Regional Board was assigned a number (e.g., Letter 1, Letter 2, etc.), and each substantive comment within the letter was assigned an alphabet letter. For example, the first substantive comment in Letter 1 is identified as "1A," the second one is identified as "1B," and so on. The Regional Board's response is immediately below each comment.

Letter 1: Dr. Richard G. Luthy

1A *"The first concern is that the proposed target for suspended solids will have no effect on DDT levels in fish unless the DDT concentrations in the suspended solids and/or channel bottom sediments are reduced."*

"Lowering the suspended solids concentration to 200 mg/L will have no effect on DDT levels in fish tissue if the concentration of DDT in sediment remains unchanged."

"It may not matter if the total sediment load is reduced unless the DDT concentration per unit weight of sediment is similarly lowered."

We believe that this TMDL will lead to a lower pesticide load. The rationale for this is described below. We concur that this TMDL will have no effect on DDT and toxaphene already in sediments or fish tissue.

Detection of pesticides in the water column (i.e., dissolved pesticides) is expected due to intense agricultural activities in the area. The persistence of these dissolved pesticides, and thus their availability to aquatic life, depends on several factors, including environmental conditions, application, and physical-chemical properties. Data shows that these water-soluble pesticides are not found at levels of concern in Imperial Valley Drains, based on twenty years of data from the statewide Toxic Substances Monitoring (TSM) Program. The TSM Program analyzes bioaccumulative substances in fish tissue collected from surface waters, and is administered by the State Water Resources Control Board and California Department of Fish and Game.

However, pesticides that are less water-soluble (e.g., DDT, toxaphene) have a high propensity to attach themselves to sediment and to store themselves in fat tissue. Transport of sediment into aquatic ecosystems leads to pesticide bioaccumulation in fish. Accordingly, the numeric target was based on the impact that suspended (i.e., non-dissolved) sediments have on aquatic ecosystems, as well as characteristics of the Imperial Valley Agricultural Drains Subwatershed (e.g., clay-rich soil). Reduction of insoluble pesticides discharged to Imperial Valley drains via agricultural discharges will reduce pesticide load to the drains and Salton Sea. This will result in less insoluble pesticide residues in the system, and therefore lessen impacts of these pesticides on the aquatic ecosystem.

Attainment of this numeric target may not lead to attainment of water quality standards related to pesticides. However, attainment of this numeric target will result in significant reductions of: (a) DDT breakdown products and toxaphene in Imperial Valley Drains, and (b) nutrients in the Salton Sea. Implementation of sediment Management Practices (MPs) will keep soil on

agricultural fields and decrease pesticide transport via suspended sediment into drains and the Salton Sea.

1B *A conceptual model is needed to link DDT concentrations in sediment to food web processes."*

Thank you for noticing our error in clarifying the link between DDT concentration in sediment to food web processes. The material noted below will be included as references or appendices in the revised Staff Report for this TMDL, to further clarify the link between DDT concentrations in sediment to food web processes.

The link between DDT and toxaphene concentrations (via sediment and other means) to aquatic food web processes is well documented in literature (Bennett 1998, Setmire et al. 1993, USEPA 1989, Kaloyanova and El Batawi 1991, Wood and Armitage 1997). The effect of local conditions and influences on this linkage has been studied or currently is under study by a number of organizations:

(1) The U.S. Geological Survey characterized pesticide transport in Imperial Valley Agricultural Drains, under contract of the Regional Board. This study was completed in March 2003. The preliminary report (LeBlanc et al. 2003) is attached. We are waiting for the final report. We will include either the preliminary report or the final report (if completed in time) in the revised Staff Report for this TMDL.

(2) The University of California at Davis assessed aquatic toxicity using invertebrates in the Imperial Valley watersheds, under contract of the Regional Board. This study was completed in December 2002. We are waiting on the final report, and will include it (if completed in time) in the revised Staff Report for this TMDL.

(3) The California Department of Fish and Game is conducting a bioassessment of Imperial Valley watersheds, under contract with the Regional Board. This study began in May 2003 and is to be completed in March 2004.

(4) The Toxic Substances Monitoring (TSM) Program has analyzed bioaccumulative substances in fish tissue collected from surface waters in Imperial Valley drains for more than twenty years. The TSM program is administered by the State Water Resources Control Board and California Department of Fish and Game. This program was discontinued in 2003, due to budget reductions. Relevant data from 1978-1995 (State Water Resources Control Board 1978-1995) is attached, and we will include this in the revised Staff Report for this TMDL.

(5) The Regional Board assessed the effect of this TMDL, including pesticide impact, on local biological resources. This assessment was completed in August 2003, and documented in the Natural Environment Study. The preliminary report (Regional Water Quality Control Board 2003b) is attached. We will include the final report as stand-alone supporting material to the revised Staff Report for this TMDL.

1C *"…the basis for the numeric standard is unexplained in terms of either a conceptual model or pragmatic issues."*

"However, the basis for the 200 mg/L standard is not discussed. The only explanation is that this level is within the upper range of the recommended values suggested by the NAS and the EPA."

Most of this information was stated in the draft Staff Report for this TMDL, though not in the same format as in this response. We will revise the Staff Report for this TMDL to make the numeric target rationale more clear.

The numeric target is based on best available data, including 1997-2002 Imperial Irrigation District data, 1978-1995 TSM Program data, and 2002 Regional Board data. This data was assessed in relation to recommendations of the National Academy of Sciences (NAS) and European Inland Fisheries Advisory Committee (EIFAC), which stated a range of values for suspended solids that generally would be protective of aquatic ecosystems. This range of values included both warmwater and coldwater streams. In 1986 and 2002, the U.S. Environmental Protection Agency (EPA) reaffirmed the NAS recommendations.
Accordingly, the proposed numeric target considers local watershed characteristics, including the warmwater nature of the Imperial Valley drain system, and is within the upper range of NAS and EIFAC recommendations. The numeric target is not based on a standard for coldwater trout streams or what the actual background water quality could be. Additionally, the numeric target also was based on other scientific literature (Wood and Armitage 1997), Management Practice cost, and staff professional judgment.

1D *"While best management practices are described in the report, there is no discussion about the extent to which best management practices are already implemented. I suspect this must have been taken into consideration but the report is silent on this point."*

Management Practices (MPs) for the proposed TMDL were analyzed for cost, effectiveness, anticipated acceptability, and likeliness of widespread implementation. The results are contained in a stand-alone report, called the CEQA Checklist and Determination. The preliminary report (Regional Water Quality Control Board 2003a) is attached. We will include the final report as stand-alone supporting material to the revised Staff Report for this TMDL.

MPs as described in this TMDL were not utilized much in the Imperial Valley prior to Regional Board adoption of the first Imperial Valley sediment TMDL (Alamo River) in June 2001. Since then, other local sediment TMDLs (New River) have been adopted. These prior TMDLs required use of Management Practices (MPs) to achieve the same numeric target as the proposed Imperial Valley Drains TMDL. MPs currently are being implemented (Imperial Valley Farm Bureau 2003) in compliance with the Alamo River and New River TMDLs, and their performance is being assessed (The Redlands Institute 2003). This proposed TMDL will bring more of the Imperial Valley into the same compliance standard, as similar farming practices are used throughout the Valley.

Letter 2: Dr. J.D. (Jim) Oster

2A *Introduction: What is the total irrigated area served by the subject drains?*

Thank you for noticing that the total irrigated area served by the subject drains was not mentioned early in the Peer Review Draft Staff Report for this TMDL. We have revised the Peer

Review Draft Staff Report to include this information earlier in the report. The total irrigated (non-idle) area served by the subject drains is 10,463 acres, and was stated in the Peer Review Draft Staff Report in Section "B. Sediment Sources and Contribution", Subsection "Farmland Runoff", Page 15.

2B *Page 6, Table 3: No information is given in the text or Table 3 about the number of samples or the standard deviation of the averages for TSS and Turbidity. Information about temporal variability is also not included.*

We apologize for the editorial omissions. The number of samples and standard deviation of the averages for TSS and Turbidity is shown in the Source Analysis appendix, in Tables B-1 and B-2. This appendix is attached, and will be included in the revised Staff Report for this TMDL.

2C *On Page 10, the basis for the numeric target for TSS is given as "due to the relatively stable flows, average sediment concentrations, and availability of TSS and turbidity data." Were the numbers used to calculate the average sediment concentrations also relatively stable?*

We apologize for our editorial omission regarding average sediment concentrations calculations. The numbers used to calculate these concentrations are contained in a Source Analysis appendix (Tables B-1 and B-5, with results in Table B-9), which is attached. We will include this appendix in the revised Staff Report for this TMDL. Additionally, we will correct the following sentence to state: "TSS and turbidity were chosen as water column sediment indicators, in accordance with USEPA's Protocol for ~~the Development of~~ Developing Sediment TMDLs (U.S. Environmental Protection Agency 1999), due to ~~the relatively stable flows,~~ average sediment concentrations~~,~~ and availability of TSS and turbidity data." We also will revise other statements related to stable water flows in the revised Staff Report for this TMDL.

2D *The basis for the target lacks quantification.*

Most of this information was stated in the Peer Review Draft Staff Report for this TMDL, though not in the same format as in this response. We will revise the Staff Report for this TMDL to make the numeric target rationale more clear.

The numeric target is based on best available data, including 1997-2002 Imperial Irrigation District data, 1978-1995 Toxic Substances Monitoring (TSM) Program data, and 2002 Regional Board data. This data was assessed in relation to recommendations of the National Academy of Sciences (NAS) and European Inland Fisheries Advisory Committee (EIFAC), which stated a range of values for suspended solids that generally would be protective of aquatic ecosystems. This range of values included both warmwater and coldwater streams. In 1986 and 2002, the U.S. Environmental Protection Agency (EPA) reaffirmed the NAS recommendations (U.S. Environmental Protection Agency 1986, U.S. Environmental Protection Agency 2002).

Accordingly, the proposed numeric target considers local watershed characteristics, including the warmwater nature of the Imperial Valley drain system, and is within the upper range of NAS and EIFAC recommendations. The numeric target is not based on a standard for coldwater trout streams or what the actual background water quality could be. Additionally, the numeric target also was based on other scientific literature (Wood and Armitage 1997, LeBlanc et al.

2003), Management Practice efficiency and cost, and staff professional judgment. The Implementation Plan requires extensive monitoring to refine the numeric target as needed.

Most of this information was stated in the Peer Review Draft Staff Report for this TMDL, though not in the same format as in this response. We will revise the Staff Report for this TMDL to make the numeric target rationale more clear.

The numeric target is based on best available data, including 1997-2002 Imperial Irrigation District data, 1978-1995 Toxic Substances Monitoring (TSM) Program data, and 2002 Regional Board data. This data was assessed in relation to recommendations of the National Academy of Sciences (NAS) and European Inland Fisheries Advisory Committee (EIFAC), which stated a range of values for suspended solids that generally would be protective of aquatic ecosystems. This range of values included both warmwater and coldwater streams. In 1986 and 2002, the U.S. Environmental Protection Agency (EPA) reaffirmed the NAS recommendations (U.S. Environmental Protection Agency 1986, U.S. Environmental Protection Agency 2002).

Accordingly, the proposed numeric target considers local watershed characteristics, including the warmwater nature of the Imperial Valley drain system, and is within the upper range of NAS and EIFAC recommendations. The numeric target is not based on a standard for coldwater trout streams or what the actual background water quality could be. Additionally, the numeric target also was based on other scientific literature (Wood and Armitage 1997, LeBlanc et al. 2003), Management Practice efficiency and cost, and staff professional judgment. The Implementation Plan requires extensive monitoring to refine the numeric target as needed.

2E *Page 8, 5th paragraph: The wording "likely due to high levels of multiple contaminants, particularly organochlorine pesticides" poses the question: Is there information about the probability that these contaminants are the cause of decline in reproductive success of colonial nesting birds? Also, are the effects of increasing salinity of the water in the Salton Sea included in the multiple contaminants?"*

The statement referred to in the Peer Review Draft Staff Report for this TMDL is based on a study by Jewel Bennett for the National Irrigation Water Quality Program division of the U.S. Fish and Wildlife Service (Bennett 1998). This study does not calculate a probability of organochlorine pesticide effect on decline of colonial nesting bird reproductive success. However, the study concludes that declines in colonial nesting bird success at the Salton Sea is "likely to be related" to high levels of multiple contaminants, particularly organochlorines. Increasing salinity of Salton Sea water was not included as one of the multiple contaminants.

Bennett's study from 1992-1994 sought to clarify biological effects of selenium, organochlorine pesticides, and boron on several important fish and wildlife species in the Salton Sea area. The study selected black-crowned night-herons, great egrets, and snowy egrets as indicator species for colonial fish-eating waterbirds. The study determined embryotoxicity through physical measurement (eggshell thickness) and chemical analysis of eggs, and observation of embryo deformity. Results indicated:

- Eggshell thickness of black-crowned night-herons was among the lowest in North America. The amount of eggshell thinning indicated that this species is "likely to be experiencing reproductive depression related to egg failures."

- A high incidence of abnormal embryos (29% of those examined in detail), inconsistent with selenium-caused deformities, was detected.

- Some egrets contained "surprisingly higher levels of DDE and toxaphene" than in the previous study. Almost half of egret eggs contained 1.5 to 6 times the amount of DDE associated with negative reproductive effects (e.g., eggshell thinning, egg breakage, reduced clutch size, reduced hatching success) in night-herons, an ecologically similar species. Toxaphene in egret eggs was 5 times higher than the geometric mean concentration detected in egret eggs in the previous study.

2F *Page 10, 5th paragraph: Does EIFAC represents European Inland Fisheries Advisory Council? If so, it needs to be defined when first used.*

Thank you for noticing our error regarding not defining "EIFAC". We will define this term in its first usage in the revised Staff Report for this TMDL. Additionally, we will include a List of Abbreviations. Yes, "EIFAC" is an abbreviation for "European Inland Fisheries Advisory Council".

2G *Page 12, 2nd paragraph: How many water samples were collected at drain outlets and analyzed for TSS, turbidity, and adsorbed DDT, DDT metabolites and Toxaphene? What method(s) were used to determine TSS?*

Thank you for noticing our editorial omission regarding the number of samples collected and analyzed, as well as the methods used. Sample data (TSS and turbidity) is contained in a Source Analysis appendix (Tables B-1 and B-2), which is attached. Sample methods (TSS and turbidity) are detailed in a Quality Assurance Project Plan (California Regional Water Quality Control Board 2002), which is attached. The Quality Assurance Project Plan will be included as stand-alone supporting material to the revised Staff Report for this TMDL. Sample data (DDT, DDT metabolites, and toxaphene) is contained in the Peer Review Draft Staff Report for this TMDL, in the Problem Statement, in Table 4 for DDT (page 7) and Table 5 for toxaphene (page 9).

Six TSS and six turbidity samples (water) were collected at the outlets of the subject drains (2 TSS and 2 turbidity samples at each of 3 drains). Sampling was implemented and analyzed in accordance with a Quality Assurance Project Plan (California Regional Water Quality Control Board 2002). Samples were collected as depth-integrated grab samples. TSS samples were analyzed using USEPA Method 160.2. Turbidity samples were analyzed using USEPA Method 180.1.

Thirty DDT and twenty-seven toxaphene samples (fish tissue) were collected in Imperial Valley agricultural drains from 1978-1995 as part of the state Toxic Substances Monitoring (TSM) Program (State Water Resources Control Board 1978-1995). The TSM Program analyzed bioaccumulative substances in fish tissue samples collected from surface waters throughout the state, and was administered by the State Water Resources Control Board and California Department of Fish and Game. This program was discontinued in 2003, due to budget reductions. DDT samples measured the amount of Total DDT (i.e., the sum of DDT and the DDT metabolites DDE and DDD).

2H *Page 12, 3rd paragraph: How many outliers were there? If outliers did occur, how much variability was there in the TSS and adsorbed chemical compositions before and after the outliers were removed? Will the techniques used to remove the outliers be used in the determination of compliance?"*

We apologize for our editorial omission regarding outlier information. Outlier analyses for TSS, turbidity, DDT, and toxaphene were completed by other parties and removed from the dataset prior to delivery to TMDL staff, as with previous Sedimentation/ Siltation TMDLs in the Region. Outlier information for irrigation delivery flow to drains is contained in a Source Analysis appendix (Table B-8). We have attached this information, and will include it as an appendix in the revised Staff Report for this TMDL. A summary regarding irrigation delivery flow follows below.

There were no outliers in the dataset, following Chauvenet's criterium procedure. There were six suspect values but these all fell within the upper and lower 95% value range, thus making them eligible for inclusion in the dataset. One record was incomplete (no figure for P Drain in October 1999). Therefore, no figures were removed from the irrigation delivery flow dataset. Standard deviation, coefficient of variance, and upper and lower 95% values are in the appendix (Table B-8) discussed above. Chauvenet's criterium procedure is one technique that will be used in assessing TMDL implementation compliance.

2I *Page 12, 5th paragraph: Are the TSS concentrations the same at all flow rates? Were the TSS concentrations determined on the same samples as used to determine average annual flows? Are there data to confirm that agricultural return flows, and associated sediment loads, are proportional to irrigation water deliveries? Is agricultural return flow the same as agricultural tailwater? Should the running title for this paragraph be changed from Agricultural Tailwater to Agricultural Return Flow?"*

Thank you for informing us that we need to clarify our wording regarding TSS concentration and flow. We will revise the Staff Report for this TMDL to make the text more clear. Additionally, we have attached a Source Analysis appendix that contains 2 months of TSS data (Tables B-1 and B-2), 72 months (6 years) of irrigation delivery flow data (Table B-4), and 72 months of drain flow away from drains (Table B-5). We will include this as an appendix in the revised Staff Report for this TMDL.

TSS concentrations do not remain the same at all flow rates. To address this, we use annual averages for our calculations (average flow is multiplied by average TSS to obtain average sediment load). Additionally, we will use annual averages in assessing future TSS data.

TSS concentrations were not determined from the same samples used to determine average annual flow. Rather, TSS concentrations were determined from 2 months of Regional Board samples (Source Analysis appendix, Table B-1 and B-2). Average annual irrigation delivery flows were determined from 72 months of Imperial Irrigation District data (Source Analysis appendix, Table B-4).

Literature shows that drain flow (away from drains) is proportional to irrigation delivery flow (to drains) in Imperial Valley (Jensen and Walter 1997). Additionally, Regional Board data and analysis of agricultural drains show the same result, that is, that drain flow (i.e., "runoff") is proportional to irrigation delivery flow (Source Analysis appendix, Tables B-4 through B-6). There is evidence that sediment load is proportional to flow rate (Kuhnle and Simon 2000).

Therefore, our stated link between irrigation delivery flows to drain flow (i.e., agricultural tailwater) and associated sediment is a reasonable one.

Agricultural return flow is not the same as agricultural tailwater, as stated on page 13 of the Peer Review Draft Staff Report for this TMDL. Rather agricultural return flow includes tailwater, tilewater, seepage, and operational spills. Therefore, we will keep the current paragraph title as "Agricultural Tailwater," and choose not to change the title to "Agricultural Return Flows." The paragraph is specifically about tailwater being a major sediment source. Other components of agricultural return flow (i.e., tilewater, seepage, and operation spills) are relatively sediment-free, and serve to dilute sediment-laden tailwater. The wording of the last sentence of the 5th paragraph, page 12, will be changed in the revised Staff Report for this TMDL to "Agricultural tailwater ~~return~~ flow was derived as being proportional to irrigation ~~water deliveries~~ delivery flow."

2J *Page 14: Dredging. The calculation to support the premise that "dredging removes about 2,467 tons/year of sediment from the subject drains" apparently is based on the maximum TSS concentration (5,000 mg/L) downstream within the flowing water during a dredging event. The application of this number is quite confusing.*

Thank you for informing us that we need to clarify our wording regarding dredging-related sediment, and for noticing our editorial error (see response to Question 16). We will correct the revised Staff Report for this TMDL to state: "Dredging <u>suspends</u> ~~removes~~ about <u>2,825</u> ~~2,467~~ tons/year of sediment from the subject drains: 51,943 <u>acre-feet/year</u> ~~AFY~~ x 0.008 ~~0.007~~ x 5,000 mg/L x 0.0013597 = 2,825 ~~2,467~~ tons/year".

Additionally, TSS results from Regional Board monitoring of a dredging operation are included in the Source Analysis appendix (Table B-11), which is attached. This will support the calculation. We will include this appendix in the revised Staff Report for this TMDL.

2K *First the quotation referred to in the previous sentence could mean that the mass of sediment removed from the drain and <u>placed on the bank of the drain or trucked away</u> is 2,467 tons/year. Second, the 5000 mg/L is the maximum concentration of the water flowing in the drain "downstream of a dredging operation" as a result of dredging. How is this number related to the mass of sediment in the bucket of the dredger? Although 5000 mg/L is a rather high number, the dredged material would be a liquid with a density very close to that of pure water: one liter of water weighing 1000 gm would contain 5 gm of sediment. Since the density of soil particles is about 2.6 grams per cubic centimeter, the 5 gm of sediment in a liter of dredged material would occupy less than 0.002 liters.*

Please see the response to Question 2J. We believe that this information will answer your questions.

2L *On the other hand, it appears the text is referring to the sediment removed from the drains by the water flowing therein as a consequence of dredging operations, not the amount of sediment removed from the drains by the dredging operations that is either placed on the drain bank or truck away and disposed elsewhere. But then what does the following sentence mean? "Some of this sediment becomes suspended into the water, though the amount is unknown."*

Please see the response to Question 2J. We believe that this information will answer your questions.

2M *Finally, dredging is not an independent source of sediment. It removes sediment generated by other sources – agricultural tail water, natural sources and farmland runoff. That it amounts to double counting is likely the reason dredging is not given as a sediment source in Figure 2, page 17.*

We concur with your statement. We will state this explicitly in the revised Staff Report for this TMDL.

2N *Page 14, Natural Sources: Isn't dredging required to maintain relatively constant channel width and depth? If so, doesn't the sediment loads due to natural sources (wind deposition and water erosion within the drain) becomes difficult, if not impossible, to define?*

Yes, dredging is required to maintain relatively constant channel width and depth. The need for dredging is due to deposits of agricultural runoff, and not due to instream erosion and wind deposition. Local factors help us to define that instream erosion and wind deposition is limited. These are stated on pages 14-15 of the Peer Review Draft Staff Report for this TMDL.

Local soils are mostly colloidal clays and silts, which tend to be cohesive and not easily erodable by water or wind. Instream erosion can be defined as limited (i.e., extremely low) due to other local factors as well, including relatively flat terrain, presence of weirs and drop structures that slow water velocity, and vegetation along portions of channel bank. Likewise, wind deposition can be defined as limited because of local factors: (a) the channel bank area exposed to wind is relatively small, and (b) most wind-blown "sand" is likely to settle on land, as the watershed has substantially more land surface area than water surface area.

2O *Page 19, 2nd paragraph: No data are provided to validate that "Water flow and sedimentation rates in the subject drains are relatively uniform and stable."*

Thank you for noticing our editorial errors and omissions. We will correct errors in the revised Staff Report for this TMDL that refer to water flow being relatively uniform and stable. Data shows that water flow and sedimentation are not stable. (To address this, we use annual averages.) Additionally, we will include water flow data (irrigation delivery and drain flow) and sediment calculations in a Source Analysis appendix (Tables B-3 through B-10, and Table B-15), which we have attached. This Source Analysis appendix will be added to the revised Staff Report for this TMDL.

2P *Page 19, 3rd paragraph: If "Significant settling of sediment does not occur in the subject drains" than why are 0.007 of the drains dredged annually (7 % in 10 years, 70 % in 100 years)?*

Thank you for noticing our editorial errors and omissions. We have corrected a mathematical error (changed the incorrect 0.007 to the correct 0.008), and related calculations/statements.

Additionally, we have attached a Source Analysis appendix with more-detailed dredging calculations (under the heading "Percent Time Dredged" and Table B-11). We will add this appendix to the revised Staff Report for this TMDL, and clarify the explanation regarding the amount of dredging that occurs in the subject drains.

There are 2 Imperial Irrigation District (IID) crews (2 persons per crew) that are responsible for dredging all 156 IID agricultural drains, among other duties. On average, these 2 crews spend 0.8% of their time dredging the subject drains per year.

2Q *What will the compliance criteria be? Is the TSS of 200 mg/L an instantaneous maximum permissible limit? What is the consequence of exceeding this limit?*

Thank you for informing us that we need to clarify our wording regarding compliance criteria. Compliance is not based on the proposed numeric target of 200 mg/L of TSS (annual average). Rather, compliance is based on meeting the load allocation, which is derived from the numeric target. Therefore, the 200 mg/L numeric target is not an instantaneous maximum permissible limit. We will add the following to the beginning of the Implementation Plan section to clarify: TMDL compliance by responsible parties will be based on meeting the load allocation (annual average), derived from the numeric target. Compliance will not be based on the numeric target itself. (A TMDL's numeric target is an interpretation of existing water quality standards, but is not a water quality standard itself.)

Consequences of exceeding the load allocation are explained on pages 28-33 of the Peer Review Draft Staff Report for this TMDL. Consequences include: enforcement of Water Quality Management Plans, submission of reports of waste discharge, adoption of waste discharge requirements, adoption of enforcement orders, issuance of Administrative Civil Liability Complaints, and adoption of referrals of recalcitrant violators to the District Attorney or Attorney General for criminal prosecution or civil enforcement. In assessing compliance of any responsible party, Regional Board staff recommends that the Regional Board consider water quality results and the degree to which the responsible party is implementing sediment-control measures. The proposed TMDL is consistent with the State Nonpoint Source Management Plan. The Implementation Plan for this TMDL identifies responsible parties (dischargers) and explains their corresponding responsibilities.

2R *If TSS of 200 mg/L is an instantaneous maximum permissible limit, is dredging possible, or will dredging not be a permitted management practice?*

Please see the response to Question 2Q. We believe that this information will answer your question regarding an instantaneous maximum permissible limit. Dredging will not be prohibited by the proposed TMDL. However, the proposed TMDL will require the Imperial Irrigation District to submit a revised Drain Water Quality Improvement Plan (DWQIP) that details their proposed program to control and monitor water quality impacts caused by drain maintenance and dredging operations. Details of DWQIP requirements can be found on pages 31-33 of the Peer Review Draft Staff Report for this TMDL.

2S *What will be the sampling and analytical criteria? When, where and how often will the drain water need to be analyzed for TSS to determine compliance? Since there are*

several methods that can be used to determine TSS, what analytical procedures will be considered satisfactory?

The requested information will be included in a Quality Assurance Project Plan (QAPP) for Implementation of the Imperial Valley Drains Sedimentation/ Siltation TMDL. The QAPP will be developed by Regional Board staff and will be ready for implementation within one month after Office of Administrative Law approval of this TMDL, as stated on page 35 of the Peer Review Draft Staff Report for this TMDL. An overview of the QAPP (including water quality monitoring and implementation tracking) is contained on pages 35-36 of the Peer Review Draft Staff Report for this TMDL.

The QAPP will follow similar procedures as QAPPs for other approved Sedimentation/ Siltation TMDLs (Alamo River, New River) in Imperial Valley. We have enclosed a copy of the Quality Assurance Project Plan for New River Siltation/ Sedimentation TMDL Implementation (California Regional Water Quality Control Board 2003) as an example.

2T *Don't those who will develop implementation plans for tracking BMP performance need such compliance information?*

Yes, compliance information will be used to track Management Practice (MP) performance. MP performance will be incorporated into an implementation tracking system currently in development (Ashe 2003, The Redlands Institute 2003) for all Sedimentation/ Siltation TMDLs in Imperial Valley.

2U *What role will the TSS criteria of 200 mg/L have when the "Regional Board consider(s) water quality results and the degree to which the responsible party – a NPS recalcitrant Violator -- is implementing sediment-control measures?" Would implementation of appropriate sediment-control measures with good management be sufficient to negate the TSS criteria?*

Most of this information was stated in the Peer Review Draft Staff Report for this TMDL, though not in the same format as in this response. We will revise the Staff Report for this TMDL to make this point more clear.

The proposed numeric target of 200 mg/L is not directly enforceable against dischargers. (A TMDL's numeric target is an interpretation of existing water quality standards, but is not a water quality standard itself.) Rather, compliance is based on the meeting the load allocation, which is derived from the numeric target. Implementation of sediment-control Management Practices (MPs) are not sufficient to be in compliance with the TMDL, if load allocations are exceeded. Many responsible parties will implement MPs, but others may not.

MPs have a well-documented range of efficiencies that are more than capable of achieving TMDL compliance. However, effectiveness of sediment MPs is dependent on site-specific and crop-specific conditions. Additionally, effectiveness can be increased greatly when different MPs are used together. Therefore, the proposed implementation plan calls for water quality monitoring to: (a) ensure that load allocations are met, (b) further characterize MP effectiveness in relation to local Imperial Valley conditions, and (c) revise the TMDL as needed.

The TMDL will be evaluated triennially (or sooner if the Board wishes) to determine its effectiveness at reducing sediment/ silt in drains. In the interim, the TMDL establishes goals for reasonable, incremental reductions in sediment/ silt loads. These interim numeric targets will be analyzed in relation to actual reductions and level of MP implementation. This analysis will be used to measure progress in addressing the water quality impairment.

Letter 3: Dr. J.D. (Jim) Oster follow-up letter

3A *You stated that the wording of flow "to the drains" is awkward, as water is delivered to the fields and then flows into a drain. You suggest that "water delivered to the service area" is a clearer phrase.*

Thanks for your comment. We have revised the Staff Report for this TMDL with the term "to the service area" in place of "to the drains."

3B *You said that in our response to your peer review Comment #5, the following wording about Bennett's study was confusing: "Some egrets contained surprisingly higher levels of DDE and toxaphene than in the previous study...Toxaphene in egret eggs was 5 times higher than the geometric mean concentration detected in egret eggs in the previous study." You indicate that the wording is confusing because there was no earlier mention of a previous study.*

We apologize for our editorial error in our response to your original written comments. This error does not appear in the revised Staff Report for this TMDL. Bennett's study was prompted in response to two previous studies. Bennett sought to further characterize the work of these previous studies.

3C *You questioned why the Pumice drain's TSS is so much higher than the other drains.*

We have not reached a conclusion regarding the reason why Pumice drain has a much higher TSS than the other drains. Possible reasons include differences in land use (idle, industrial, etc.), slopes at the field level, and crop practices (irrigation method, type of crop, etc.).

Average TSS data for this TMDL is based on 2 months of data. The TMDL requires monitoring activity during implementation. This new data will be evaluated, and the numeric target and corresponding load allocations will be adjusted as necessary.

3D You noticed that the TMDL allows for revision of the numeric target and load allocations based on new monitoring data that becomes available during implementation. You stated that this is a good provision in the TMDL.

Thank you. We believe a phased approach is prudent to provide adequate time for implementation, data collection, and adjustments to the TMDL.

3E *You stated that the new dredging wording is much clearer than in the original draft of the Peer Review Staff Report.*

We are glad that our wording revision is clearer.

Letter 4: Dr. G.M. Kondolf

4A *One key issue that needs to be clarified is whether there are ecological or human resources in the drains themselves that must be protected. e.g., any fish or organisms living there for which a TSS limit could be specified? If not, if the TSS in the drains is only a concern insofar as it affects the total sediment load to the Sea, then the real issue - how much sediment can acceptably be delivered to the Sea - is not being addressed. Unless, that is, the drains are believed to somehow "treat" the sediment if TSS is below some threshold. If this is the underlying assumption, it needs to be explicitly expressed and justified.*

The information you requested, regarding clarification of ecological and human resources that need protection, is contained in the: (a) Natural Environment Study (California Regional Water Quality Control Board 2002a), and (b) CEQA Environmental Checklist and Determination (California Regional Water Quality Control Board 2002b). Both of these are attached, and will be included as stand-alone supporting documents to the Staff Report for this TMDL.

The only human resource in the drains themselves is infrequent fishing activity. Ecological resources in the drains include over one-hundred special status species and natural communities, including nineteen endangered and/or threatened species, identified in the literature review as occurring or potentially occurring in the project vicinity (California Regional Water Quality Control Board 2002a). The listed species of most concern in the project area include the desert pupfish, Yuma clapper rail, and California black rail. However, these 100+ species and communities are not listed in terms of a TSS limit.

Rather, the Basin Plan (California Regional Water Quality Control Board as amended to date) discusses a TSS (i.e., suspended solids) water quality objective. The objective is in narrative form: "Discharges of wastes or wastewater shall not contain suspended or settleable solids in concentrations which increase the turbidity of receiving waters, unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in turbidity does not adversely affect beneficial uses." To meet the TSS water quality standard, Regional Board staff determined that the TSS numeric target should be 200 mg/L for the Imperial Valley Drains project area, to be moderately protective of aquatic resources. The full rationale for this numeric target is discussed on page 10 of the Peer Review Staff Report for this TMDL.

The TSS limit in the proposed TMDL is not in relation to the Salton Sea, which is not listed for sediment/silt, only for nutrients, salt, and selenium. Sediment/silt is an important source of Salton Sea nutrients for the Salton Sea, and the drains in the proposed TMDL do discharge directly to the Salton Sea. The shallow area of the Salton Sea (near drain outlets) is an important refuge for fish during the summer months when deeper areas of the lake have low dissolved oxygen.

4B *The role of dredging needs to be clarified - if dredging is simply re-suspending sediment that was deposited from ag drainage, then does it matter? Not if the concern is ultimate delivery of sediment to the Sea, maybe yes if TSS in the drain itself is the issue.*

Thank you for informing us that we need to clarify our wording regarding dredging-related sediment. We will add the following statement to the revised Staff Report for this TMDL:

> Dredging is not an independent source of sediment. Rather, dredging suspends sediment generated by other sources--mostly from agricultural tailwater, with small contributions from natural sources and storm event runoff from farm land.

Yes, sediment is an issue within the drains themselves. Sediment data, represented by total suspended solids (TSS) and turbidity, indicate that the subject drains are impaired by sediment. The Regional Board must address this because beneficial uses in the drains are being degraded. These beneficial uses include warm freshwater habitat; wildlife habitat; preservation of rare, threatened, or endangered species; water contact recreation; non-contact water recreation; and freshwater replenishment (page 5 of the Peer Review Staff Report for this TMDL).

4C *p.11 for the three drains, only one value is given for existing TSS. Actual TSS must vary considerably. Are these means, medians, or some other statistic? and calculated from how many samples drawn when? Aren't there seasonal variations, and how do you capture those?*

We apologize for the editorial omissions. Actual TSS for each sample event for each drain is shown in the Source Analysis appendix, in Tables B-1 and B-2. (A summary follows in the next paragraph.) This appendix is attached, and will be included in the revised Staff Report for this TMDL. The existing TSS value for each drain is an annual average, as stated on page 6 of the Peer Review Staff Report for this TMDL—we will revise the title of the table on page 11 to clarify that TSS is an annual average. We also will add the following statements to the revised Staff Report for this TMDL to explain seasonality:

> Sediment becomes suspended in tailwater regardless of the season. However, more flow at certain times of year means that more sediment becomes suspended in drains at certain times of year. To address this seasonal variation, the numeric target is expressed in terms of an annual average. If data for certain months exceeds the target load allocation, this may be tempered by low data readings in other months. Therefore, variability is accounted for and addressed by use of an annual average.

Six TSS samples were collected at the outlets of the subject drains (2 TSS samples at each of 3 drains), in March and April 2002. Additionally, the proposed TMDL calls for TSS monitoring and includes a process for revising the numeric target if future data warrants.

4D *p.12 Again, how many samples, what season, etc.*

We apologize for the editorial omissions. We will add the following statement to the revised Staff Report for this TMDL: Raw data and calculations are contained in Appendix B. We have attached this appendix, and will include it in the revised Staff Report for this TMDL. The appendix contains:

(a) 2 months of TSS data (Tables B-1 and B-2), from March and April 2002,

(b) 72 months (6 years) of irrigation delivery flow data (Table B-4), from January through December 1997-2002, and
(c) 72 months of drain flow away from drains (Table B-5), from January through December 1997-2002.

4E *p.13 "Natural Sources": Need to specify the "empirical method" used to estimate instream erosion and wind deposition.*

We apologize for the editorial omission. We will edit the following in the revised Staff Report for this TMDL:

> Natural source (in-stream erosion and wind deposition) load was calculated ~~using an empirical method.~~ by multiplying the total flow for all subject drains in acre-feet by the estimated natural sources TSS annual average in mg/L by a conversion factor to convert mg/L to tons.

4F *"Farmland Runoff" - is this component the runoff itself or sediment carried by such runoff?*

Thank you for letting us know that we need to clarify our wording. We are referring to the sediment load carried by the storm-related runoff from farm land. We will edit the following section heading (from page 13 of the Peer Review Staff Report) in the revised Staff Report for this TMDL:

> ~~Farmland Runoff~~ Load from Potential (Calculated) Storm Event Runoff from Farm Land

We also will edit the subsequent paragraph:

> ~~Farmland~~ Storm-related farm land runoff load was calculated using: (a) total acreage of farmland that could influence the subject drains, and (b) recorded precipitation data from 1997 through 2002, using a TSS literature value of 150 mg/L (Horner et al. 1994).

We also will edit similar section headings to incorporate the words “Load from” in the title. Additionally we will edit the following section heading (from page 15 of the Peer Review Staff Report) in the revised Staff Report for this TMDL:

> ~~Farmland Runoff~~ Potential (Calculated) Storm Event Runoff from Farm Land

4G *p.14 Dredging. This is called a "major sediment source to the subject drains", yet the dredging is from the drains, correct? "Many drains require periodic dredging to maintain adequate drainage, due to sediment loads received from agricultural fields." Need to explicitly state the basis of these values. Is 2,467 t/y an average, and if so over what years? Basis for 0.007 percent of subject drains being dredged at any one time? Need to clarify how this component is computed and counted in budget. Statement that "some of this sediment becomes suspended into the water, though the amount is unknown" seems at odds with the calculation above and its assumption of 5000 mg/l concentration during dredging.*

Thank you for informing us that we need to clarify our wording regarding dredging-related sediment. The Source Analysis appendix contains the following material that will support the calculation: (a) TSS results from Regional Board monitoring of a dredging operation (Table B-11), and (b) the percentage of time crews spend dredging the subject drains per year (under the heading Percent Time Dredged). This appendix is attached, and will be included in the revised Staff Report for this TMDL. Additionally, we noticed a mathematical error and will correct the revised Staff Report for this TMDL to state:

> Dredging is a major sediment source to the subject drains. Many drains require periodic dredging to maintain adequate drainage, due to sediment loads received from agricultural fields. Dredging is not an independent source of sediment. Rather, dredging suspends sediment generated by other sources--mostly from agricultural tailwater, with small contributions from natural sources and storm event runoff from farm land. Dredging potentially suspends ~~removes~~ about 2,825 ~~2,467~~ tons/year of sediment from the subject drains:
>
> 45,340 ~~51,943~~ acre-feet/year ~~AFY~~ x 0.008 ~~0.007~~ x 5,000 mg/L x 0.0013597 = 2,466 ~~2,467~~ tons/year
>
> where: 45,340 acre-feet/year ~~51,943 AFY~~ = total flow for the subject drains (i.e., annual average)
>
> 0.008 ~~0.007~~ = amount (i.e., 0.8% in decimal form) ~~percentage (in decimal form)~~ of time that maintenance crews spend dredging the subject drains per year (see Appendix B) ~~Imperial Valley drains that are dredged at any particular time~~
>
> 5,000 mg/L = TSS concentration downstream of a dredging event
>
> 0.0013597 = conversion factor from mg/L to tons/year
>
> 2,466 ~~2,467~~ tons/year = amount of sediment suspended ~~removed~~ by dredging in the subject drains

The amount of sediment (2,466 tons/year, revised from 2,467 tons/year) is a potential amount, as it is a calculation, as shown above. The calculation is based on annual average flow computed from six years' worth of monthly data from 1997-2002. The amount of sediment that stays suspended (versus the amount that settles) after dredging is unknown.

4H *Most fundamentally, if the sediment dredged from the drains came "from agricultural fields", wouldn't this component already be counted (as an input) from the estimated farmland runoff? If 29,545 t/y is carried from fields to drains (p.13) and 2,467 t/y is removed from drains, can we infer that just under ten percent (2467/29545) of the sediment coming from the ag fields is deposited in the drains and later dredged?*

Please see the response to Question 4G. We believe that this information will answer your questions. Additionally, we will add the following statement to the "Summary of Sediment Sources" section: Dredging is not included as a sediment source, as dredging is not an independent source of sediment.

4I *p.15 Explain how the 3 in/y precip or 5% acreage irrigated is used to get the values in table 9.*

Thank you for informing us that we need to clarify our wording regarding Table 9. Detailed calculations are in the Source Analysis appendix (Table B-15), which is attached. We will include this in the revised Staff Report for this TMDL. Additionally, we will revise the Staff Report for this TMDL to make the text more clear, including (among others):

(a) editing the section title on page 15 to "Potential (Calculated Storm Event ~~Farmland~~ Runoff from Farm Land"
(b) editing the subsequent paragraph on page 15 to "Runoff from farm land due to storm events ~~Farmland runoff~~ is a relatively insignificant sediment source to the subject drains."
(c) editing the table title on page 15 to "Summary of Potential Farmland Runoff Due to Storm Events ~~Summary~~"
(d) adding the following statement: These figures were calculated, not measured, and represent a worst-case scenario. Even in a worst-case scenario, the amount of storm-related runoff from farmland is minimal. Detailed calculation methods and data are in Appendix B.
(e) changing the precipitation value from 3 inches/year to 2 inches/year, as calculated in the Source Analysis appendix (Table B-12)

The following statements in the Peer Review Staff Report for this TMDL (page 15) may help answer your question, now that the meaning is clearer due to above changes:

> A total of 10,463 acres of farmland drain into the subject drains. However, the Imperial Valley has an arid climate (about 3 inches of rain per year). Therefore, potential stormwater runoff from farmland can be disregarded except for areas that were being irrigated just before, during, and just after the storm[1]. About 5% of Imperial Valley farmland is irrigated on any given day (Bali 2000). Therefore, about 523 acres are irrigated on any given day in the study area (5% of 10,463 acres). This acreage potentially could generate farmland runoff, particularly if soils already were saturated.

Table 9 summarizes runoff that comes from irrigated (saturated) farm land after a storm event, and therefore is different that irrigation return flow. Such runoff, as a product of precipitation events, has the potential to cause large-scale erosion in areas prone to intense storm events and erosion. Most local stormwater runoff originates from farm land draining into the Imperial Valley Agricultural Drains watershed. However, local Imperial Valley factors (e.g., colloidal clays and silts, terrain flatness, presence of weir and/or drop structures, partially vegetated channels) make erosion minimal, even in a worst-case scenario, as represented in Table 9.

4J *The Farmland Runoff section implies that farmland runoff is generated not by precip but by irrigation. Need to explain how this value differs from irrigation return flow, and to explain how actual rainfall -generated runoff is accounted for.*

[1] Valley farmers order water deliveries two days ahead of time, and may not be able to factor in precipitation (to reduce their water orders) if the storm was not forecast before the order.

Please see the response to Question 4I. We believe that this information will answer your questions.

4K *p.18 lack of seasonality - due to warm weather for crops year-round and relative lack of winter rains?*

Thank you for asking us to clarify our statements on seasonality. We will edit the following in the revised Staff Report for this TMDL:

> ~~There are no obvious critical conditions/ seasonality in regards to sediment in the subject drains. Water flow and climate are relatively stable.~~ Strong seasonal differences exist regarding local water flow, but not regarding local climate (Appendix B). Sediment becomes suspended in tailwater regardless of the season. However, more flow at certain times of year means that more sediment becomes suspended in drains at certain times of year. To address this seasonal variation, the numeric target is expressed in terms of an annual average. If data for certain months exceeds the target load allocation, this may be tempered by low data readings in other months. Therefore, variability is accounted for and addressed by use of an annual average.

4L *p.19 If I read this correctly, the subject drain assimilative capacity is calculated as the amount of sediment carried by the drains at the target TSS of 200 mg/l (p.10)? In this case, it is set as a standard for water quality in the drain, not in the Salton Sea, the receiving water body. Or does the method assume that the drains can "assimilate" and "treat" sediment loads up to 200 mg/l? This concept of assimilation, derived from notions that natural water bodies can assimilate and treat some loads of sewage effluent or other such pollutants, is probably not applicable here, as the contaminant of concern is suspended sediment, and conservation of mass would dictate that the sediment must go somewhere (it is not "assimilated away"): either carried out to the Salton Sea, or deposited along the way within the drain channels themselves, or if the drains overflow, adjacent lands.*

Yes, the subject drain assimilative capacity is calculated as the amount of sediment carried by the drains at the target TSS of 200 mg/L. Yes, the target is what we are setting as a goal for water quality (our interpretation of a narrative water quality objective into a real-world numeric objective) in the drains themselves, not the Salton Sea. No, the sediment load derived from the 200 mg/L target is NOT what the drains can “treat”. Rather, the sediment load is what the drains can assimilate while still being moderately protective of aquatic resources, as stated in the European Inland Fisheries Advisory Council (EIFAC) literature survey (European Inland Fisheries Advisory Council 1965) discussed on page 10 of the Peer Review Staff Report for this TMDL.

Some sediment carried by drains does settle in the Salton Sea, at the deltas where the drains enter the Sea. However, the Sea is not listed as impaired for sediment/silt at this time. The main focus of this TMDL is to achieve water quality objectives and protection of beneficial uses in agricultural drains, by eliminating impairments of excess sediment through the establishment of allowable sediment loads.

4M *p. 21-22 The sediment load allocation is stated as a total of 12,924 t/y, evidently based on an allowable 200 mg/l. The future ag drain flow is anticipated to be less as a result of less irrigation water applied due to water transfers. The load to the Salton Sea is then calculated as a lower value, proportional to the reduced flow of drainwater from ag fields. While a reduction in suspended sediment delivered to the Sea is a plausible outcome, this does not imply that the reduced load is under some threshold limit of load acceptable to the Salton Sea ecosystem, because the original assimilative capacity was based on a standard for concentration in the drains, not based on any analysis of how much sediment the Sea can absorb prior to experiencing some negative effects. If the standard is set as a function of an acceptable TSS in the drainwater (or in the receiving water body), it should be applied in the same way.*

Yes, the total sediment load allocation is based on an allowable 200 mg/L. The load applies to the drains, not to the Salton Sea, though the Salton Sea will benefit from reduced sediment load in the drains because less sediment will enter the Sea.

The analysis in the Peer Review Staff Report for this TMDL was based on current information, including the Colorado River Quantification Settlement Agreement (QSA) water transfer that will reduce irrigation delivery flow. However, during our analysis we did not assume that the water transfer would become final because we could not depend on that occurring. We made our analysis on current conditions. The TMDL does have a process that allows the TMDL target to be adjusted if there are changes from the current conditions, including changes like a water transfer plan. This process is stated in the Implementation Plan under "Interim Numeric Targets" (page 34) of the Peer Review Staff Report for this TMDL.

4N *p. 22 Note that parentheses don't close on the calculation lines*

Thank you for noticing our editorial omissions. We will correct both calculation lines by closing the parentheses in the revised Staff Report for this TMDL.

4O *p.31 Mention of seasonal restrictions to avoid impacts on sensitive resources. Is this because of seasonal occurrence/activity of species, or seasonal differences in sediment delivery, or both? Need to clarify.*

This issue is addressed in more detail in the Natural Environment Study, which we have attached, and which will be included as a stand-alone supporting document to the Staff Report for this TMDL. We will edit the following in the revised Staff Report for this TMDL:

> These measures must include: (a) seasonal restrictions to avoid impacts on sensitive resources <u>during the nesting season</u>, and (b) certified CEQA documents should the practices fall outside the scope of this TMDL.

Seasonal restrictions to avoid impacts on sensitive species are in conjunction with seasonal nesting activity of these sensitive species. Work that may impact sensitive species (especially through noise) must occur outside of the nesting season, typically from September to February. Seasonal restrictions (as used in the Peer Review Staff Report for this TMDL) are not in conjunction with seasonal sediment delivery.

4P *p.34 Table 12 shows the TMDL attainment is in terms of TSS in the drains, so consistent with setting of assimilative capacity.*

Thank you for informing us that our table title needs to be clarified. We will edit the title in the revised Staff Report to say: "Interim Numeric Targets ~~for TMDL Attainment~~". This edit will make the table consistent with the preceding paragraph of the Peer Review Staff Report for this TMDL, which states: "The Regional Board's goal is attainment of TMDL allocations by the year 2013."

4Q *Still outstanding is to explicity address how TSS in drains relates to water quality in Salton Sea, the impaired water body.*

The focus of this TMDL is protection of beneficial uses in the agricultural drains themselves, not in the Salton Sea, though the Sea will benefit from reduced sediment load in the drains because less sediment will enter the Sea. Imperial Valley agricultural drains are listed as impaired by sediment/silt, but the Salton Sea currently is not.

The numeric target of 200 mg/L TSS was selected to be moderately protective of aquatic resources, as stated on page 10 of the Peer Review Staff Report for this TMDL. The numeric target takes into account that the drains are a warmwater system, and thus are generally more turbid than coldwater streams (Waters 1995).

4R *Need to specify (perhaps left to committee for future?) how the TSS values will be calculated from the various samples collected for different places at different times of year. A simple average?*

The requested information will be included in a Quality Assurance Project Plan (QAPP) for Implementation of the Imperial Valley Drains Sedimentation/ Siltation TMDL. The QAPP will be developed by Regional Board staff and will be ready for implementation within one month after Office of Administrative Law approval of this TMDL. The QAPP will follow similar procedures as QAPPs for other approved Sedimentation/ Siltation TMDLs (Alamo River, New River) in Imperial Valley. We have enclosed a copy of the Quality Assurance Project Plan for New River Siltation/ Sedimentation TMDL Implementation (California Regional Water Quality Control Board 2003) as an example.

4S *Note that some of the BMPs (e.g., pan ditch, channel vegetation) would affect only natural ditch erosion, which is believed to be a small component of the overall budget. Each BMP should be put into context of the overall sediment budget and how much it would affect.*

The requested information is included in the CEQA Environmental Checklist and Determination, which we have attached, and which will be included as a stand-alone supporting document to the Staff Report for this TMDL. We will add a statement to the revised Staff Report for this TMDL to state that an evaluation of Management Practice effectiveness is contained in the CEQA Environmental Checklist and Determination.

Each Management Practice was evaluated for cost effectiveness, silt reduction effectiveness, anticipated acceptability by farmers, and likeliness of widespread implementation. This information is displayed in Table 1 in the CEQA Environmental Checklist and Determination.

REFERENCES CITED

CH2M-Hill. 2002. Imperial Irrigation District, Water Conservation and Transfer Project, Final EIR/EIS and Draft Habitat Conservation Plan. Prepared for Imperial Irrigation District and U.S. Bureau of Reclamation. June 2002.

EXTOXNET (Extension Toxicology Network). 1996. Pesticide Information Profiles. Dicofol. http://extoxnet.orst.edu/pips/dicofol.htm

Jones & Stokes Associates. 1996. List of Agricultural Best Management Practices for the Imperial Irrigation District. Jones & Stokes Associates. Sacramento, CA

Schade, Theodore D. 2002. California State Water Resources Control Board Hearing Regarding Salton Sea Testimony of Theodore D. Schade, Great Basin Air Pollution Control District.

Natural Resources Conservation Service. 1996. Field Office Technical Guide, Section IV, Conservation Practices. U.S. Department of Agriculture, Davis, CA

Pesticide News. 1999. Dicofol. No. 43, March 1999, p. 20-21. Available online at http://www.pan-uk.org/pestnews/actives/dicofol.htm

State Water Resources Control Board. 1978-1995. California Toxic Substances Monitoring Program. State Water Resources Control Board. Sacramento, CA

United States Department of Agriculture. 1996. Field Office Technical Guide, Section IV. Natural Resources Conservation Service. Davis, CA

APPENDIX

Original Comment Letters