SECTION 3.0

Master Responses

HYDROLOGY

3.1 Master Response on Selenium Mitigation

3.1.1 Introduction

The Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) has identified increased selenium concentrations as a significant and unavoidable impact of the Proposed Project (and certain Alternatives) after mitigation in Imperial Irrigation District (IID) surface drain discharges to the Alamo River, in the Alamo River at the outlet to the Salton Sea, in the IID surface drain discharge to the New River, and in the IID surface drains discharging directly to the Salton Sea as significant and unavoidable. The Draft EIR/EIS indicates that no reasonable mitigation measures are available to reduce the selenium concentrations, although the Habitat Conservation Plan (HCP) does provide for habitat replacement to mitigate the biological impacts of selenium in IID drains. Commenters have disagreed with the conclusion that mitigation for selenium concentrations is not available, noting that Best Management Practices are available to address selenium impacts. Some commenters also have noted that selenium Total Maximum Daily Load (TMDLs) (required by the Clean Water Act) for drains and the Salton Sea will require Imperial Valley farmers to address selenium impacts through BMP implementation. Another frequent comment is that it is likely that the selenium aquatic life criteria will be reduced from 5 to 2 micrograms per liter (µg/L).

3.1.2 Background

In responding to the comments, the first issue to address is a misleading value included in Table 3.1-4 of the Draft EIR/EIS. The table includes a historical value at the New River's outlet to the Salton Sea of 7.1 µg/L. The number was computed as the mean of 30 values for selenium concentrations and is believed to be unrepresentative due to inclusion of a concentration of 100 µg/L for May 1971. Because this concentration is extremely high and because no other selenium data are entered into this database prior to October 1988, the May 1971 value is believed to be an error.

The erroneous selenium value was not identified earlier because the Imperial Irrigation Decision Support System (IIDSS) was developed using water quality data from 1987 through 1998. The mean value of the 29 entries recorded during this period is 3.9 µg/L. This number was used in calibration of the selenium functions in the IIDSS and is believed to be a better representation of mean selenium concentration at the outlet of the New River to the Salton Sea.

After the correction described above, Table 3.1-1 presents values for selenium concentrations for the period from 1987 through 1998 that were observed for the historical condition and modeled for the Baseline and the Proposed Project. Table 3.1-4 has been revised to reflect the correct data and is included in subsection 3.1 of Section 4.2, Text Revisions in this Final EIR/EIS.

TABLE 3.1-1
Average Historical, Baseline, and Proposed Project Values for Selenium Concentrations (µg/L)

Value	New River Outlet	Alamo River Outlet
Historical	3.9	7.7
Baseline	3.3	6.3
Proposed Project	3.8	7.9

In the case of the New River, largely because of the contribution of flow crossing the International Boundary from Mexico, historical selenium discharge at the river outlet to the Salton Sea is below the current 5 µg/L aquatic life criterion. Under the Baseline and Proposed Project conditions, the proportion of New River discharge originating in Mexico increases as does the proportion of irrigation deliveries discharged as tilewater to satisfy the increased leaching requirement needed to offset the higher salinity assumed in delivered water. Because the increase in Colorado River salinity is not mirrored by an increase in selenium concentrations, the average selenium concentration at the outlet of IID drains to the New River declines.

With respect to the Alamo River, the historically observed concentration at the river's outlet to the Salton Sea is nearly double that observed in the New River. This is primarily due to the absence of the large inflows from Mexico that dilute selenium from other sources in the New River. As with the New River, under the Baseline and Proposed Project, the proportion of irrigation deliveries discharged to drains increases to offset the increased salinity of Colorado River water.

Values in Table 3.1-1 show that the New River discharges to the Salton Sea under historical, Baseline and Proposed Project conditions are consistently below the current 5-µg/L aquatic life criterion. Observed and modeled values for selenium concentrations in the Alamo River are above the current aquatic life criteria for the historical condition and are predicted to remain so under both Baseline and Proposed Project conditions.

3.1.3 Mitigation Setting

Identification of appropriate mitigation measures is governed by the setting in which the measures are to be implemented. Within the IID water service area, flow generated from tailwater and tilewater contributes about 68 percent of the outflow at the outlet of the Alamo River to the Salton Sea and about 54 percent of the outflow at the outlet of the New River. As rivers whose flow is comprised largely of agricultural drainage, the Alamo and New Rivers are not once pristine streams fouled by agricultural drainage, but former desert washes that are now working rivers whose existence depends upon their capacity to receive agricultural drainage.

With respect to selenium, the critical component of agricultural drainage is tilewater, water that has been percolated through the soil for the purpose of flushing salts and metals from the root zone. The ability to leach soils for control of salts and metals is a requirement of sustainable irrigated desert agriculture. In contrast, tailwater is irrigation water that is discharged from the agricultural field surface to the drains. Therefore, while conservation measures other than fallowing may reduce tailwater discharges, system seepage, and operational spillage, tilewater discharges fluctuate little between historical conditions and those of the Baseline and Proposed Project. As a result, the proportion of flow contributed by tilewater is greater under the Baseline condition (wherein total water use in IID is predicted to decrease) than has been observed historically. Similarly, under the Proposed Project, the proportion of flow contributed by tilewater increases further as tailwater and system losses are again reduced. The values in Table 3.1-2 illustrate how flow from Mexico in the New River buffers this change relative to that observed in the Alamo River.

TABLE 3.1-2
Average Historical, Baseline and Proposed Project Values for the Proportion of Tilewater at the Rivers' Outlets (percentage)

Value	Alamo River Outlet	New River Outlet
Historical	34	26
Baseline	37	28
Proposed Project	46	30

Thus, if it is assumed that irrigated agricultural production will continue without decline, then two consequences that follow are:

- A substantial portion of present and future flows in the New and Alamo Rivers will be tilewater discharge having selenium concentrations governed by selenium concentrations in the Colorado River.
- Reduced tilewater discharge will lower Salton Sea elevations unless the tilewater is replaced with water from another source.

Tilewater is an essential byproduct of irrigated agriculture in the Imperial Valley, but, as a constituent of irrigation drainage, it also sustains habitat for wildlife sensitive to increases in selenium. Tilewater's function of removing contaminants from irrigated lands conflicts with its role of supporting wildlife because, if not treated or adequately diluted by higher quality water from other sources, tilewater has selenium concentrations that frequently exceed aquatic life criteria and do not support habitat objectives. Therefore, selenium mitigation measures often focus on addressing the effects of increasing selenium concentrations on wildlife.

Further complicating formulation of a mitigation strategy, most technologies for treating selenium in tilewater remove selenium by techniques that substantially reduce the volume of discharged water. Although these technologies will be discussed later in this response, even if a technique for removal of selenium from tilewater had been broadly adopted elsewhere, this would not guarantee its suitability for mitigation within the IID water service area where the value of the reduction in selenium loading would have to be weighed against the cost in lost discharge to the Salton Sea.

In examining possible mitigation strategies, the following two broad approaches were considered:

- Mitigation based on technologies to remove selenium from drain water. The objective of this strategy was to identify technologies that could be applied to remove selenium from tilewater to achieve compliance with aquatic life criteria within the IID water service area.
- Mitigation to minimize the biological impacts of high selenium concentrations while maintaining discharges to the Sea. Measures considered under this strategy focus on detection and mitigation of impacts to wildlife and include introduction of water with lower selenium concentrations to dilute waters in critical habitat areas to acceptable concentrations. This strategy does not concentrate on numerical compliance with current or future aquatic life criteria nor does it feature treatment of tilewater to reduce mass loading of selenium.

3.1.4 Technology-based Mitigation

In considering the applicability of various options for treatment of selenium in tilewater, it is important to consider that the IID water service area and the Salton Sea are in a setting different from those where most selenium treatment technologies are being developed. For example, some commenters noted the use of piped laterals in reducing selenium loads. A demonstration project using this technology has been successful in reducing the volume of seepage from seleniferous soils entering irrigation laterals in the Umcompahgre River Basin in Colorado. While piping of irrigation laterals reduced the selenium load delivered in irrigation water by 28 percent at this demonstration site, this approach is not applicable within the IID water service area where selenium is not entering irrigation laterals from seleniferous soils.

Commenters also stated that selenium mitigation techniques now used in California could be applied within the IID water service area. Within California, most research on control of selenium has focused on the drainage issues of the San Luis Unit of the Central Valley Project and on removal of selenium from drain water that has percolated through seleniferous soils on the west side of the San Joaquin Valley, particularly in the areas of the Panoche Water and Broadview Water Districts. These are discussed below.

San Luis Unit Drainage

Studies conducted in attempts to define and plan drainage service to the San Luis Unit have emphasized treatment methods designed to reduce the masses of salts and selenium discharged to the final drain configuration. One of the key issues yet to be decided in the debate over the San Luis Drain is determination of where the drain waters would be discharged, a determination that is influenced to some degree by the cost of the final drain configuration. Because the outlet of the San Luis Drain will certainly not be a water body that relies on drainage discharge for its sustenance, techniques that reduce both the hydraulic loading to the drain as well as the masses of salts and metals discharged to the drain are acceptable, or even preferable, because they reduce the required drain capacity.

Techniques that have received attention in studies of the San Luis Unit are deep well injection, solar evaporation of water combined with landfilling of solid residue, and sequential reuse of drainage water.

Disposal by deep-well injection. Deep well injection entails discharging or injecting tilewater into geologic receiving formations that do not contain fresh water at depths ranging from approximately 5,000 to more than 8,000 feet below the land surface.

Deep well injection requires pretreatment, including filtration and chlorination, to prepare the drainwater for injection. Pilot injection wells drilled by Westlands Water District had a capacity to inject 0.15 million gallons per day (mgd). The combined capital and operating costs of deep-well injection are estimated to range from $242 to $356 per acre-foot[1]. These costs were estimated using a six percent interest rate, and a 25-year service life.

Evaporation basins and disposal of solids in landfills. A second treatment alternative is the construction of evaporation basins and disposal of solids in landfills. As with deep-well injection, this alternative has been considered for disposal of tilewater generated within the San Luis Unit. In the case of IID, a fundamental concern regarding use of landfills is the high cost of constructing and maintaining landfills that can safely contain materials such as selenium.

Evaporation pond designs prepared by the Natural Resources Conservation Service require approximately 0.3 acres of land for each acre-foot of water to be evaporated in the Hanford-Lemoore area. Total annualized capital and operating costs for treatment by evaporation ponds are estimated to be $630 per acre-foot[2].

If an economically feasible evaporation process could be designed to extract solids from discharged wastewater, then landfill options are governed by the concentrations of salts and trace constituents, such as selenium, contained in the extract. California regulations divide solid wastes into categories that determine the class of landfill in which a solid waste can be deposited. If concentrations of arsenic, molybdenum, selenium and trace organics fall below the acceptance levels for a Class III landfill, then disposal costs may be largely those of transporting the waste to a local landfill. However, if the waste material must be disposed of in either a Class II or a Class I landfill, landfill costs (as well as cradle-to-grave ownership by the waste generator and future superfund closure of the landfill) become an increasingly significant factor.

Sequential reuse. This term describes a variety of methods for managing agricultural drainage through reapplication of tilewater to a sequence of increasingly salt-tolerant and selenium-receptive crops such as atriplex, canola, kenaf, and tall fescue. The number of steps comprising the reuse sequence is variable as are the crops to which the drainage water is applied at each stage of the sequence.

The system being implemented at Red Rock Ranch (located in San Joaquin, California) and a similar system more recently installed at Rainbow Ranch (located in San Joaquin, California) first use irrigation water in a low-saline zone covering about 75 percent of the area growing vegetables and other salt-sensitive crops. Tilewater from this area is blended with tailwater

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1 San Luis Unit Drainage Feature Re-Evaluation Preliminary Alternatives Report, USBR, December 2001.

2 Ibid.

(irrigation water in the case of Rainbow Ranch) and used to irrigate salt-tolerant commercial crops such as cotton, sugar beets, and grasses on a "low-saline" zone occupying about 20 percent of the area. The drainwater from this zone is used on very salt-tolerant grasses or halophytes in the "moderate-saline" zone. This drainwater is used on halophytes in the "high-saline" zone (the Rainbow Ranch system only has the first three stages). The concentrated brine collected from the "high-saline" zone must then be disposed of.[3]

Costs have been reported for the integrated drainage management pilot project at Red Rock Ranch. Excluding the costs for the low-saline zone and for the solar evaporator, the capital costs for tile drains and irrigation system installation amount to an annual capital cost of around $80 per acre-foot of drainage water used by the facility. The cost of land is not included in this total. Assuming cotton (acala variety) is grown on the low-saline zone, using U.C. Cooperative Extension (1999) costs of production and returns and assuming (1) no reduction in cotton yields, and (2) no returns on the salt-tolerant forages and halophytes, the annual operating costs amount to about $70 per acre-foot. This leads to a total cost of about $150 per acre-foot of drainage water treated.

The high costs of the treatment approaches being considered for the San Luis Unit and the extent to which they would reduce flows to the Salton Sea, makes the three approaches described above problematic for large-scale implementation at IID. For these reasons, these approaches are not identified in this Final EIR/EIS as feasible mitigation measures for Project-related selenium concentrations.

Panoche and Broadview Water Districts

Treatment approaches being developed for selenium-laden water in Panoche Water and Broadview Water Districts are intended for a setting where selenium is native to local and upland soils and where the central concern is reduction of the selenium mass discharged to the San Joaquin River. Therefore, while selenium controls being considered in the context of the San Luis Drain are secondary to control of salinity, in Panoche and Broadview, reduction of selenium loads is of paramount importance.

Pilot projects installed in these areas are based on research showing that selenium can be taken up by plants, volatilized, or converted by biological processes to insoluble forms that can be removed from the water. The process tested at Panoche was based on research at the Algal Research Laboratory indicating that selenium that is concentrated in bacterial cells can then be removed as sludge. Although up to 80 percent of the waterborne selenium can be removed by this process, biological sampling has shown that aquatic organisms in treated water contain higher concentrations of selenium than those living in untreated water. This is because the selenium is converted from selenate to more bioavailable forms that are taken up more readily by aquatic organisms.

At Broadview, initial trials of a pilot program emphasized that selenium volatilization can take place in wetland settings and selenium reduction can take place in anaerobic conditions. The volatilization and reduction take place in plant roots, probably via bacteria that live in the root environment. More recently, trials at Broadview have also focused on the bacterial activity that produces a selenium-rich sludge.

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[3] Ibid.

At both Panoche and Broadview, the concept has been to develop long, wetland flow paths that expose selenium-laden water to bacterial activity for periods of up to 50 days to produce a sludge containing high concentrations of selenium. The end product of this approach is a dense, low-volume precipitate that can be scraped from each wetland bioreactor cell or removed through filtration.

The same bacterial consortium that reduces nitrate also reduces selenium. However, because nitrate is consumed preferentially, during the period treated water resides in the wetland, bacteria first reduce nitrates before actively volatilizing selenium. This preferential consumption of nitrates is a governing factor in the long hydraulic residence times required for selenium removal.

In spite of results showing high rates of selenium removal at Panoche and Broadview, these results were generated by small pilot studies that have not been extended to regional trials or accepted as proven methodologies for selenium removal. At Panoche, treatment increased selenium bioavailability, which would lead to greater exposure of fish or birds feeding on organisms living in treated water. Application of this technology within the IID water service area could increase, rather than mitigate, selenium impacts to fish and wildlife. At Broadview, it was estimated that approximately 0.5 tons of straw were required for each acre-foot of water undergoing treatment to provide carbon needed to fuel the biological processes central to selenium removal. At the scale of IID's drainage system, this would equate to provision of large masses of straw (or an alternative carbon source) to drive the treatment process and disposed of the carbon source residue after its carbon content had been depleted. In the case of Broadview, burning of the straw residue has been recommended, but in the context of the Imperial Valley this would compound the air quality problems that now exist in the valley. Finally, and perhaps most importantly in the context of the Broadview experience, the inflow concentrations of selenium to the treatment process are generally higher than those observed in the IID water service area while outflow concentrations are similar to concentrations observed in the IID water service area. For example, one treatment was observed to reduce selenium concentration from approximately 26 μg/L to approximately 7 μg/L, a second treatment plotted on the same graph shows an inflow concentration of 7 μg/L and an outflow concentration of approximately 3 μg/L. Therefore, it appears that the percentage of selenium removed at Broadview is influenced by the selenium concentration of the influent water and that the concentrations of IID tilewater (approximately 15 μg/L) are well below the values of from 25 to 40 μg/L reported at Broadview.[4]

Given the preliminary nature of these trials and the large volume of tilewater that would be evaporated during wetland treatment, it was determined that it would be misleading to suggest that removal of selenium by wetland treatment offers a solid foundation for mitigation of the impacts of high selenium concentrations within the IID water service area. For these reasons, wetland treatment is not identified in this Final EIR/EIS as a feasible mitigation measure for Project-related selenium concentrations.

[4] Broadview Water District in consultation with Agrarian Research and Management Company. 2001. Selenium Removal Project (flow-through Channel Project), Final Report, June 29.

Physical and Chemical Methods for Selenium Removal

Physical methods for selenium removal such as reverse osmosis, ion exchange, and co-generation as well as chemical means such as treatment with iron filings and ferrous hydroxide have been investigated. Although such methods are potentially effective, they are expensive and are not currently recommended for the large scale required for the treatment of agricultural drain water. No projects beyond "lab-bench" scale research have been implemented for this type of remediation.

Another strategy for selenium removal is fixed-film biological reactors and sludge blanket reactors, which act to convert selenate to insoluble forms of selenium. Although the research relating to the role of microalgae in reducing selenate has been extensive, and detailed cost estimates for large-scale projects have been conducted, no field programs have yet been implemented. Therefore, these reactors also have not progressed beyond the testing stage into practical research and development.[5]

Based upon the limited development of these physical and chemical methods, they are not identified in this Final EIR/EIS as feasible mitigation measures for Project-related selenium concentrations.

Summary

In summary, after review of available technologies for selenium mitigation, we determined that none had been fully implemented as proven mitigation measures in the settings where they were being developed and that it would be premature to present them as mitigation measures that would be successful at within the IID water service area for Project-related impacts.

3.1.5 Mitigation to Minimize Biological Impacts

For reasons outlined in the previous section, it was determined that existing technologies for selenium removal do not provide a feasible solution to the problems posed by high selenium concentrations in tilewater within the IID water service area. Therefore, the approach adopted in the Draft EIR/EIS , and retained in this Final EIR/EIS, is to mitigate the impacts to wildlife predicted to result from increased selenium in the drains caused by the Proposed Project rather than meeting a specific numeric target. This approach is appropriate for three reasons. First, selenium concentrations in some IID drains and at some points of discharge to the Salton Sea currently exceed the current aquatic life criterion of 5 µg/L. Requiring achievement of 5 µg/L would impose a greater mitigation obligation than the impact attributable to the Proposed Project. Second, concerns regarding selenium concentrations in the drains relate to its potential toxicological effects to wildlife. Third, the effects attributable to the Proposed Project could be distinguished from existing and Baseline conditions.

The approach to mitigating impacts of increased selenium is to create sufficient alternate habitat for species using the drains to offset reduced reproductive output of wildlife using the drains. The level of reproductive impairment of waterbirds from selenium concentrations in the drains was determined for Baseline conditions and with

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[5] Ibid.

implementation of the Proposed Project. This analysis is provided in the HCP, Section 3.5.2.1, Water Quality Effects. Through this analysis, the number of acres of alternate habitat necessary to offset the increased level of reproductive impairment caused by the Proposed Project was determined. Under the HCP, IID would create sufficient acreage of managed marsh habitat to address selenium effects. By creating alternate habitat with better water quality, the combined reproductive output of wildlife in the drains plus the alternate habitat would be the same as under the Baseline. Thus, biological impacts of selenium would be mitigated.

3.1.6 Selenium TMDL

Correspondence from the California Regional Water Quality Control Board (RWQCB) – Colorado River Basin Region states that, "It is our understanding that the proposed selenium TMDL would focus on selenium throughout the Upper and Lower Colorado River Basin States (Colorado River Watershed), and would address selenium reduction at the sources, but could also include management practices to address concentrating of selenium in Imperial Valley."[6] This statement is consistent with the view taken in the HCP that mitigation on the part of IID to meet numerical criteria is not practical unless it is carried out within the context of a much more extensive mitigation effort. In particular, if the aquatic life criterion were reduced to 2 µg/L, this would establish a concentration criterion that is below the selenium concentration of water received by IID from the Colorado River.

3.1.7 Selenium Balance

Staff of the RWQCB developed selenium balances for the New and Alamo Rivers that were used to generate estimates of selenium concentrations for comparison with values presented in the Draft EIR/EIS.

There are four important points that distinguish analyses developed by staff from those conducted using the IIDSS. Three of these points apply equally to analyses conducted of the New and Alamo River Basins. One point, the erroneous value for average concentration of selenium at the outlet of the New River contained in Table 3.1-4 of the Draft EIR/EIS was described at the beginning of this document. The remaining points are discussed below.

(1) RWQCB staff assumed that selenium is stable, which would allow selenium concentrations to be computed by mass balance. In development of the IIDSS, the initial approach was to treat all water quality constituents as conservative. However, in the case of selenium, mass inflows computed from observed flow volumes and selenium concentrations did not square with mass outflows computed from observed flow volumes and selenium concentrations at the outlets of either the New River or the Alamo River. In addition, there are reasons to believe that chemical, biological, and physical processes affect selenium concentrations during transport. These processes are particularly important to understanding selenium concentrations in the New River.

(2) RWQCB staff estimated the selenium concentration of rainfall, municipal, industrial, and operational (RMIO) discharges and seepage to be 2.5 µg/L and staff closed their mass balance on the tilewater term. As an alternative, tilewater concentrations can be estimated directly under the assumption that all of the selenium imported into the on-

[6] Correspondence from Teresa Newkirk Gonzales, dated April 18, 2002.

farm system is discharged in either tailwater or tilewater and that the combined tailwater and tilewater volumes equal a percentage of the delivered water volume that can be determined from the IIDSS water balance for the condition being examined. Therefore, for historical conditions, where combined tailwater and tilewater discharges account for 31 percent of farm deliveries:

Tilewater concentration = ([TA +TI]/0.31 x 2.5 μg/L – TA x 2.5 μg/L)/TI

Where:

TA = tailwater volume

TI = tilewater volume

2.5 μg/L = the selenium concentration of Colorado River deliveries and of tailwater

In the case of the New River, this leads to a tilewater concentration of 13.4 μg/L versus a concentration of 20.3 μg/L estimated by RWQCB staff. In the case of the Alamo River, this approach leads to a concentration of 14.4 μg/L versus a concentration of 16.5 μg/L estimated by RWQCB staff.

It should also be noted that RWQCB staff took from Table 3.1-4 a slightly higher value for the selenium concentration of New River flow from Mexico than was used in development of the IIDSS (3.0 μg/L versus 2.2 μg/L). In addition, the RWQCB staff's assumed selenium concentration of RMIO discharges, 2.5 μg/L, is lower than estimates developed from IIDSS data. The discrepancy between RWQCB staff's assumed value for RMIO concentration and values computed using IIDSS data is particularly evident for the Proposed Project where conservation measures that reduce canal spillage lead to increases in the estimated concentration of RMIO discharges.

(3) The third difference is that flow volumes used by RWQCB staff are based on a mass balance structure where all flow and selenium entering the drainage system are discharged at the outlets of the New and Alamo Rivers. This departs from a balance developed from IIDSS data that has larger volumes of water discharged to the rivers, but has a portion of the discharged water lost through phreatophyte uptake and evaporation. This loss of water results in higher selenium concentrations being calculated by mass balance at the rivers' outlets. The impact of these losses on selenium concentrations is particularly apparent under the Proposed Project, which has the highest proportion of losses relative to inflows.

An additional point that should be considered explicitly in any review of the Draft EIR/EIS is the impact of the adjustments made in development of the modeling Baseline on water quality output under both the projected Baseline conditions and under the Proposed Project. These adjustments are discussed in the Master Response on *Hydrology – Development of the Baseline* in Section 3 in this Final EIR/EIS.

Baseline adjustments have no impact on the selenium concentration of water entering the IID water service area from either the Colorado River or the New River. However, they do affect the proportion of Colorado River water that is discharged to drains and the proportion of this discharge that enters the drainage system in tailwater, tilewater, seepage, spillage, and M&I discharge. The changes in the proportion of delivered water discharged to drains and in the pathways through which water enters the New and the Alamo River systems affect selenium concentrations modeled under the Baseline conditions.

Adjustments made in constructing the Baseline influence discharges computed for the Proposed Project. This is because the IIDSS computes outflow to the Salton Sea under the Proposed Project using Baseline outflows as the reference for water conservation, while the RWQCB staff estimated savings directly from historical outflows. The result is that for the Proposed Project, IIDSS discharge at the outlet of the Alamo River is about nine percent below that estimated by the RWQCB staff while the IIDSS estimate of discharge at the mouth of the New River is about five percent below that of the RWQCB staff.

If the RWQCB staff analyses are modified so that selenium concentrations in tilewater are computed as described above and modifications are made that approximate Baseline adjustments under the IIDSS, the resulting flow volumes and selenium concentrations yield calculated selenium concentrations at the outlets of the New and Alamo Rivers similar to those generated by parallel mass balances using flow and concentration values from the IIDSS. These values are shown below in Table 3.1-3 for the New River and in Table 3.1-4 for the Alamo River.

TABLE 3.1-3
Comparison Between Mass Balance Estimates of Mean Selenium Concentration at the Outlet of the New River

Condition	IIDSS Balance	Modified Board Staff Balance
Baseline	5.6	4.9
Proposed Project	6.4	5.5

TABLE 3.1-4
Comparison Between Mass Balance Estimates of Mean Selenium Concentration at the Outlet of the Alamo River

Condition	IIDSS Balance	Modified Board Staff Balance
Baseline	7.3	7.0
Proposed Project	9.5	8.9

As noted above, mass balance estimates of selenium concentrations at the mouths of the New and Alamo Rivers fail to consider the effects of chemical and biological transformation mechanisms. Therefore, while Tables 3.1-3 and 3.1-4 show that, after adjustment for Baseline conditions, values from the IIDSS and from the RWQCB staff analyses result in similar estimates of selenium concentrations. The values computed by both of these mass balances are greater than those estimated by the IIDSS, which includes chemical and biological transformation algorithms calibrated to simulate the impacts of chemical, physical, and biological processes on selenium concentrations.

In conclusion, the approach used to estimate selenium concentrations in the Historical, Baseline, Proposed Project and Project Alternative modeling conducted using the IIDSS is sound and generates output that provides a reasonable standard for determining the impacts of Project implementation.

3.2 Master Response on Water Transfers to CVWD (QSA Implementation Scenario)

3.2.1 Introduction and Background

The predicted salinity concentration, elevation and surface area for the Salton Sea presented in the Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) are based on a "worst-case" scenario for the Salton Sea to ensure that impacts to the Sea were not underestimated. Specifically, the worst-case scenario was modeled under the assumption that the maximum quantity of water to be transferred by IID under the Proposed Project, 300 thousand acre-feet per year (KAFY), would be transferred out of the Salton Sea Basin. Under the IID/SDCWA Transfer Agreement Implementation Only scenario, the total 300 KAFY would be transferred to San Diego County Water Authority (SDCWA), the Quantification Settlement Agreement (QSA) would not be implemented, and Coachella Valley Water District (CVWD) would not receive up to 155 KAFY provided to CVWD under the QSA (including up to 100 KAFY from IID and 55 KAFY from other sources). Thus, no drainage flows from that amount of water use in the CVWD service area would be discharged to the Salton Sea.

The Proposed Project under this EIR/EIS includes the conservation by Imperial Irrigation District (IID) of up to 100 KAFY for transfer to CVWD, if CVWD exercises its option under the QSA to acquire such conserved water. (CVWD's acquisition of the additional 55 KAFY pursuant to the QSA is not part of the Proposed Project.) The Draft EIR/EIS assessed the use by CVWD of the up to 100 KAFY only at a programmatic level. CVWD's use of that amount, plus any additional amount acquired pursuant to the QSA, is expected to be described in a comprehensive manner in the Coachella Valley Water Management Plan, which is currently available only in draft form. The impacts of this Plan will be assessed in a Program EIR being prepared by CVWD. Because final, approved documents were not available for use in the Draft EIR/EIS, and are not currently available, it was not considered appropriate to rely upon drainage inflows to the Salton Sea from CVWD's receipt of water from IID or others pursuant to the QSA.

In response to comments received from CVWD and others, this master response presents, for comparison purposes, modeling results for a scenario which assumes that CVWD would receive the maximum 155 KAFY provided for under the terms of the QSA. The resulting effects to the Salton Sea are discussed below.

3.2.2 Approach

Based on discussions with U.S. Fish and Wildlife Service and California Department of Fish and Game and available literature, it is estimated that the Salton Sea will no longer be able to support the reproduction of a viable fishery when the salinity concentration of the Sea reaches 60 ppt[7].

[7] This document uses the terms "ppt" (parts-per-thousand) and "mg/l" in reporting salinity. It is recognized that these two terms differ slightly as salinity increases due to the difference in the specific gravity of saltwater versus freshwater. The analyses of Salton Sea salinity were performed using concentrations in mg/L (converted to g/L). Model results are reported in ppt for simplicity and ease of understanding.

Output from the Salton Sea Accounting Model (SSAM) for the Proposed Project, using the IID/SDCWA Transfer Agreement Implementation Only scenario, indicates with 95 percent certainty that the Sea would reach the threshold 60 ppt between the years 2011 and 2014, or on average by the year 2012. The mean predicted elevation of the Sea in the year 2077 under this scenario would be –250 msl, compared to an elevation of 235 msl in 2077 under the projected Baseline. With implementation of the Salton Sea Habitat Conservation Strategy, as described in the Master Response in Section 3.5, IID would replace inflows to the Sea at a rate equal to or greater than the Baseline to assure that the Sea does not reach 60 ppt until 2030. The elevation of the Sea at the end of the Project term (2077), with implementation of the IID/SDCWA Transfer Agreement Only scenario and the Salton Sea Habitat Conservation Strategy, would be –240 msl.

Assuming QSA implementation (without the Salton Sea Habitat Conservation Strategy), and CVWD's receipt of 155 KAFY of water pursuant to the QSA, the Sea would still reach the 60 ppt threshold by the year 2012 (refer to Table 3.2-1 in this section). The similarity in the time frame for impacts under both scenarios could likely be attributed to the time delay of CVWD's aquifer recovering (filling). CVWD's aquifer is currently severely overdrafted, therefore, while the aquifer is recovering there will be a period where no inflows will be available to the Sea from the use of the water. However, if CVWD were to use the received water for agricultural use rather than to recharge the aquifer, inflows to the Salton Sea could increase, reducing the overall obligation of the Salton Sea Habitat Conservation Strategy. Without the QSA, it is likely that CVWD will continue using groundwater to meet demands (including demand for the 155 KAFY which would have been provided under the QSA), unless other water sources are identified. CVWD has indicated that if the QSA is implemented and it receives the 155 KAFY, the water would be used to recharge the aquifer and thus little, if any, return flows would be observed at the Salton Sea for approximately 25 years. With implementation of the QSA, the predicted mean elevation in the year 2077 would be –246 msl, a difference of four feet compared to the IID/SDCWA Transfer Agreement Implementation Only scenario.

If it is assumed that CVWD receives 155 KAFY with QSA implementation and the Salton Sea Habitat Conservation Strategy is implemented, the predicted mean elevation of the Salton Sea in the year 2077 is -236 msl, nearly identical to the projected Baseline. The mean elevations from SSAM and the predicted year when 60 ppt is reached for the IID/SDCWA Transfer Agreement Implementation Only scenario and the QSA Implementation Scenario are shown on Table 3.2-1.

TABLE 3.2-1
Proposed Project Scenarios Without and With Implementation of the Salton Sea Habitat Conservation Strategy

Scenario	Without Implementation of the Salton Sea Habitat Conservation Strategy		With Implementation of the Salton Sea Habitat Conservation Strategy	
Proposed Project Scenarios	**Elevation in 2077 (msl)**	**Year 60 ppt is reached[2]**	**Elevation in 2077 (msl)[2]**	**Year 60 ppt is reached[2]**
IID/SDCWA Transfer Agreement Implementation Only Scenario				
300 KAFY to SDCWA (Assumes conservation by on-farm and system based measures only)	-250	2012	N/A[1]	
300 KAFY to SDCWA (Assumes conservation by fallowing only)	-241	2017	-240	2030
QSA Implementation Scenario				
200 to SDCWA and 100 to CVWD(Assumes conservation by on-farm and system based measures only)	-246	2012	N/A[1]	
200 to SDCWA and 100 to CVWD (Assumes conservation by fallowing only)	-236	2017	-236	2030
Baseline	-235	2023	N/A	

[1] Implementation of the Salton Sea Habitat Conservation Strategy in concert with only on-farm and system based conservation measures is not currently considered to be practicable. These "efficiency conservation" measures require a 1 to 1 ratio of mitigation water to the Sea. That is, for every acre-foot (AF) of water conserved for transfer, an AF would need to be provided to the Sea in order to meet the obligations of the Salton Sea Habitat Conservation Strategy. This mitigation water would be provided by additional fallowing or water from other sources. The combination of conservation required to produce 300 KAFY for transfer plus conservation by fallowing to produce the related amount of mitigation water to meet the obligations of the Salton Sea Habitat Conservation Strategy has not been assessed in this Draft EIR/EIS. It is noted, however, that the source of mitigation water to implement the Salton Sea Habitat Conservation Strategy is not limited to fallowing or other Colorado River water provided by IID. If IID elects to pursue implementation of efficiency conservation together with the Salton Sea Habitat Conservation Strategy, additional environmental analysis may be required depending on the quantity and source of mitigation water. However, some combination of efficiency conservation measures and fallowing could potentially be implemented with the Salton Sea Habitat Conservation Strategy, although the amount of each that would be required to feasibly satisfy the Salton Sea Habitat Conservation Strategy has not been determined.

[2] All values presented in this Table are mean values predicted by the Salton Sea Accounting Model (SSAM).

3.3 Master Response on Development of the Baseline

3.3.1 Introduction

A number of commenters questioned the hydrologic Baseline used in the Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) to describe existing conditions, particularly the Baseline used to reflect conditions at the Salton Sea. Although the specific comments varied, the objections, in broad terms, are as follows:

- Project impacts must be compared against a "frozen snapshot" of the existing setting as of the date of publication of the Notice of Preparation (NOP) for the EIR/EIS.
- The modeled Baseline used in the EIR/EIS, which projects future conditions, violates California Environmental Quality Act (CEQA).
- The projected Baseline for the Salton Sea includes unsubstantiated or incorrect hydrological assumptions.
- The projected Baseline for the Salton Sea creates a hypothetical, distorted Baseline that exaggerates the future degradation of the Sea, which, in turn, results in a significant underestimation of Project impacts and mitigation requirements.
- The Baseline assumes a reduction of inflows to the Salton Sea, which is not supported by the evidence.
- The Baseline and the No Project conditions are inappropriately "conflated."
- The Baseline results in an underestimation of cumulative impacts.

This discussion responds to those issues and explains the development and use of the Baseline in the Draft EIR/EIS.

Purpose of the Baseline

The purpose of the Baseline is to present hydrologic conditions (primarily water quantity and quality) without the Project, against which Project impacts can be identified and compared.

Complexity of Existing Setting. The hydrologic conditions of the Lower Colorado River (LCR), the Imperial Valley and the Salton Sea are complex and interrelated. The Imperial Irrigation District (IID) water service area is huge—within a total area of approximately 1,000 square miles, about 461,000 acres are irrigated annually by a system that includes approximately 1,672 miles of canals and laterals and approximately 1,500 miles of surface drains. IID imports Colorado River water for all irrigation purposes. Virtually all of the irrigation drainage from the IID water service area flows into the Salton Sea and constitutes the Sea's primary inflow source. Historically, the conditions that affect irrigation, drainage, and inflow to the Salton Sea have varied from season to season and from year to year, as evidenced by record data, and they are reasonably expected to continue to vary over the 75-year term of the Project. Conditions contributing to variability include weather, cropping patterns, agricultural practices, soil type, and infestations.

Complexity of Project Effects. The effects of the Project's proposed conservation program on existing conditions are also complex. Factors contributing to the complexity include the substantial length of the Project term, anticipated variations in conservation methods (which could include various on-farm conservation measures, system improvements, and fallowing), changes in the farmers who participate in the voluntary on-farm program, variations in the conservation efficiency of participants, and changes in the location of conservation projects throughout the district. The fact that the conservation program will ramp up from a relatively small initial increment to full implementation over a period of approximately 24 years also complicates the analysis of Project impacts and requires projection substantially into the future.

Salton Sea Conditions. Existing conditions and Project impacts at the Salton Sea are also difficult to identify due, in part, to the unique nature of the Sea (an inland saltwater lake, primarily fed by irrigation drainage, and with no outlet other than evaporation) and the fact that certain Sea conditions and processes have not been extensively studied and are not well understood. In addition, certain well-defined trends are apparent in existing conditions at the Salton Sea, most notably increasing salinity, which will cause adverse changes in the resource without the Project and even before full implementation of the Project. It is appropriate to reflect this trend in the Baseline because it is an element of existing conditions and the adverse changes it will cause during the Project term should be differentiated from changes resulting from Project implementation. The development and use of the Baseline is premised on the assumption that CEQA and National Environmental Policy Act (NEPA) do not require the Project proponent to identify as Project impacts, or to mitigate for, impacts that are not caused by the Project. In order to identify Project impacts, it is necessary to develop a means for differentiating those impacts from conditions, that would otherwise result from existing conditions.

3.3.2 Development of the Baseline

The Lead Agencies sought to develop a reliable method to simulate the variability and trends that are an intrinsic part of the existing hydrologic conditions, as well as to predict the effects of the conservation program over the 75-year Project term. Several key decisions were made as follows:

- It was determined that historical data derived from a single point in time cannot effectively express either existing conditions or the effects of the Project. Conditions over a sufficiently long time period must be considered to encompass long-term variability and trends.
- In order to assess the impacts of a variable program over a substantial time period and varying hydrological conditions, both existing conditions and Project effects should be projected into the future to reflect conditions after full ramp up of the conservation program and continuing for the balance of the Project term.
- The future effect of well-defined trends apparent in existing conditions should be included in the Baseline so that Project impacts can be separated from other conditions that emerge.

- It was determined that a combination of hydrologic models is the most reliable method for analyzing both existing conditions and Project impacts.

These models are predictive tools, which may seem at odds with the goal of identifying actual, on-the-ground baseline conditions. However, given the variable nature of these conditions, the lengthy Project term, and the scale of the Project and the affected area, as described above, no other method can provide a similarly comprehensive and reliable analysis to describe the range of conditions and effects and to account for multiple conservation measures that vary in type, time, and location throughout the irrigated area. A "frozen snapshot" of conditions at a specific time period would provide only a limited view of a complex resource and would not facilitate the complex analysis of Project impacts, which the predictive models provide.

Hydrologic Models

To develop the models used to establish the Baseline and to predict Project impacts, available historical data were used to calibrate and verify varying hydrologic conditions projected during the Project term, assuming the continuation of existing conditions and well-defined trends. Historical data over a substantial time period were used in order to include the range of hydrological conditions that are reasonably likely to repeat over the Project term. Implementation of the Project over the range of conditions expected during the Project term was also simulated and compared against this Baseline, in order to isolate Project impacts. The following models were used:

Colorado River Simulation System Model (CRSS). The original version of this model was developed, calibrated and verified during the late 1970s and early 1980s by Reclamation. Throughout the 1980s and early 1990s, the model was applied extensively for policy studies on the Colorado River. The current CRSS model, as implemented in RiverWare, was verified through an extensive process to reproduce the results of its predecessor. The Riverware CRSS was used for the *Draft EIS for the Implementation Agreement, Inadvertent Overrun and Payback Policy, and Related Federal Actions, 2002*. It was also used for the *Final EIS for the Interim Surplus Guidelines,* 2001. The CRSS uses Colorado River flow records from 1906 through 1990 to estimate future flows, reservoir elevation, and salinity without the Project. CRSS was also used to model the effect of reduced flows in the Colorado River caused by the Project's proposed changes in the point of diversion required to transfer water via the Colorado River Aqueduct to San Diego County Water Authority (SDCWA) and/or Metropolitan Water District of Southern California (MWD). The assumptions and methodology used in the analysis are explained in Appendix C to the Draft EIS for the Implementation Agreement, Inadvertent Overrun Policy, and Related Federal Actions described above. The analysis of the LCR impacts of the QSA included in the Draft QSA Programmatic Environmental Impact Report (PEIR) utilized the same analysis developed for the Implementation Agreement (IA) EIS. These assumptions and the methodology were not changed in the Final IA EIS or the Final QSA PEIR.

Imperial Irrigation Decision Support System (IIDSS). This model was developed by IID to simulate the district's extensive irrigation and drainage system. The IIDSS uses historical data from 1987 to 1998 to estimate future hydrologic conditions (in terms of water quantity and quality) within the IID water service area without the Project, based on the present state of irrigation, and the effect of conservation measures on the system and its drainage outflows to the New and Alamo Rivers and the Salton Sea. The IIDSS can process a large volume of different conservation measures and track conservation volumes and water quality changes anywhere within the system – at the end of any surface drain, at any drain junction on a river system, and at all discharge locations to the Salton Sea. The assumptions and methodology used to develop this model are explained in the Summary Report included as Appendix E to the Draft EIR/EIS. The IIDSS must be integrated with the CRSS and the Salton Sea Accounting Model (SSAM) in order to reflect the hydrological linkages between the LCR, the IID water service area, and the Salton Sea. Output from CRSS was used as input for IIDSS. Output from IIDSS was used as input to SSAM, described below.

Coachella Valley Water District (CVWD) Groundwater Model. This model was developed by CVWD to predict and manage groundwater within the CVWD service area. The CVWD Groundwater Model uses historical data from 1936 through 1996 to predict future groundwater conditions. More details regarding the CVWD Groundwater Model are contained in the CVWD Water Management Plan. (Also, see Master Response on *Other—Relationship Between the Proposed Project, QSA, IA, IOP, and CVWD Water Management Plan* in this Final EIR/EIS.)

Salton Sea Accounting Model. SSAM was developed by Reclamation, with input from IID and CVWD, in order to provide a consistent methodology to describe historical, existing, and future elevation, surface area, and salinity of the Salton Sea, given existing conditions and trends and the effect of IID's conservation program as well as the effect of the CVWD Groundwater Management Plan. The SSAM focuses on key parameters affecting Sea conditions — inflow, elevation, surface area, and salinity. The assumptions and methodology used to develop the SSAM are explained in the document included as Appendix F to the Draft EIR/EIS. A similar model was used in the Draft EIS/EIR for the Salton Sea Restoration Project, released in January 2000, to identify the effect of reduced inflows to the Sea. The model used in the January 2001 Restoration EIR/EIS was a predecessor to the current model but did not include links to the IIDSS and the CVWD Groundwater Model. Additionally, the SSAM used for the Proposed Project has been enhanced to include refined elevation and area curves, evaporation estimates, ungaged inflow estimates, stochastic analysis capabilities, and the ability to predict salt precipitation and/or biologic reduction as described in Appendix F of the Draft EIR/EIS.

3.3.3 CEQA Requirements

As several of the commenters noted, the CEQA Guidelines require an EIR to describe the environmental setting, defined as the physical environmental conditions in the vicinity of the Project as they exist at the time the NOP is published. Section 15125(a) of the Guidelines provides:

> This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. [Emphasis added.]

It is not disputed that the Draft EIR/EIS describes the environmental setting. However, commenters object to the use of the modeled Baseline to assess Project impacts because it predicts conditions over the Project term rather than the conditions in effect on the specific date when the NOP was published. Although it is acknowledged that the environmental setting normally constitutes the baseline conditions, the actual physical conditions to be affected by this Project, especially Salton Sea conditions, require a more refined and complex approach to identify Project impacts. The Guideline quoted above does not mandate that a frozen snapshot of existing conditions be used. As noted in an authoritative text on CEQA compliance:

> Both the Guidelines and following Discussion provide that physical conditions at the time of the [NOP] normally constitute the baseline for determining impacts, but a lead agency may determine that another baseline is more appropriate, either for overall evaluation of a project's impacts or for evaluation of a particular project impact. For example, if it is known that a certain surrounding environmental condition will either improve or degrade by the time the project is implemented, the lead agency may have a basis for selecting a different baseline for evaluating environmental impacts related to that condition. If the lead agency does elect a different baseline, the lead agency should be careful to explain in the EIR why a different baseline has been selected and to summarize the evidence or determination surrounding the selection of a different baseline. [8]

The Salton Sea is a unique, complex, and evolving water body that is directly affected by reductions in irrigation drainage and constituents in the inflows. The existing conditions of the Salton Sea reflect a historical trend of increasing salinity, which will be continued into the future without a major intervention aimed at restoration. This trend results in declining water quality and habitat values. The trend is significant and predictable and was recognized in the 2001 Draft EIS/EIR for the Salton Sea Restoration Project, which also utilized an earlier version of the SSAM. As noted in that Draft EIS/EIR:

> The Salton Sea ecosystem is under stress from increasing salinity, nutrient loading, oxygen depletion, and temperature fluctuations that may be threatening the reproductive ability of some biota, particularly sportfish species, and also causing additional ecosystem health problems. There are indications that the deteriorating environmental conditions may be contributing to the prominence of avian disease at the Sea. Without restoration, the ecosystem at the Sea will continue to deteriorate. [Executive Summary, page ES-1]

As noted above, it is appropriate to reflect this trend in the Baseline because it is an element of existing conditions, and it is appropriate to differentiate adverse changes in conditions at the Sea resulting from this trend from changes caused by the Project. The Draft EIR/EIS utilizes a reasonable method of presenting the Baseline and identifying the Project impacts,

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8 Kostka, Stephen L. and Michael H. Zischke, 2002. California Environmental Quality Act (CEQA), Section 12.26, updated January 2002, p. 489. See also, Remy, Michael H. et al., Guide to the California Environmental Quality Act (CEQA), 10th ed., 1999, p. 165.

which is the result of substantial time, effort and expense. It is within the Lead Agencies' discretion to adopt this analytical method.

A recent case, Save Our Peninsula Committee v. Monterey County Board of Supervisors (2001), 87 Cal.App.4th 99, recognized a lead agency's discretion to establish an appropriate baseline, based upon information included in the EIR. The court stated:

> Because the chief purpose of the EIR is to provide detailed information regarding the significant environmental effects of the proposed project on the 'physical conditions which exist within the area,' it follows that the existing conditions must be determined, to the extent possible, in the EIR itself. . . . [citations] . . . On the other hand, the agency has the discretion to resolve factual issues and to make policy decisions. If the determination of a baseline condition requires choosing between conflicting expert opinions or differing methodologies, it is the function of the agency to make those choices based on all of the evidence.[9]

The court also rejected the theory that the baseline must be rigidly determined as of a specific date, the date when the NOP is filed:

> . . .[T]he date for establishing baseline cannot be a rigid one. Environmental conditions may vary from year to year and in some cases it is necessary to consider conditions over a range of time periods. In some cases, conditions closer to the date the project is approved are more relevant to a determination whether the project's impacts will be significant.

The court, citing County of Amador v. El Dorado County Water Agency (1999), 76 Cal.App.4th 931, 955, and CEQA Guidelines Section 15151, cautioned that an adequate baseline description requires more than raw data; it also requires sufficient information and analysis to enable the decisionmakers to make intelligent choices.[10]

The Save our Peninsula case was followed in Fat v. County of Sacramento (2002), 2002 Cal. App. LEXIS 3679, where the appellate court upheld an EIR in the face of a challenge to the baseline used by the lead agency. The court held that CEQA Guidelines Section 15125 gives the lead agency the discretion to deviate from the time-of-review baseline.

Following the direction provided by these cases, the Draft EIR/EIS provided a reasoned methodology and analysis to allow the Lead Agencies to adopt the described Baseline and to identify and assess Project impacts in a meaningful way.

3.3.4 Specific Assumptions

The commenters raised specific objections to several assumptions used to develop the modeled Baseline, which require a response, set forth below.

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9 87 Cal. App. 4th 99, 120.

10 Ibid, 124.

1988 IID/MWD Agreement

Commenters questioned the treatment of the 1988 water transfer transaction between IID and MWD. The 1988 IID/MWD Agreement was assessed in the *Final EIR for Modified East Lowline and Trifolasm Interceptors and Completion Projects* (IID 1994). It provides for the transfer to MWD of water conserved as a result of conservation projects funded by MWD in the approximate amount of 100-110 KAFY. The conservation projects have been fully installed and funded; conserved water commenced to be transferred in 1990 and was fully "ramped up" to the maximum amount by 1998. As a result of these conservation projects, conserved water will continue to be available for transfer to MWD during the Project term. Based upon the fact that this project has been fully approved and implemented, its ongoing effects, both as of the date the NOP was filed and for the future period during implementation of the Project, are appropriately included in the Baseline.

Commenters specifically challenged, as unsubstantiated by the historical record of IID water use, the projected decrease in inflows to the Salton Sea of approximately 0.1 million acre-foot per year (MAFY) as a result of the 1988 IID/MWD Agreement. Claims that the effects of the 1988 water transfer are unsubstantiated by the historical record are not accurate. Analysis of Salton Sea inflow records compared to historical water use is not sufficient to evaluate the effects of the 1988 IID/MWD Agreement. The decrease in Colorado River diversions from the IID/MWD Agreement began in 1989 and ramped up over 10 years to the full amount in 1998. As a result, the full effects of that project were not observable until 1998. Ultimately, a projection of the full amount of the IID/MWD transfer into the future will show an average decrease in IID diversions of approximately 110,000 acre-feet per year (AFY) and a corresponding impact on the Salton Sea. However, looking only at Colorado River diversions was determined by IID and MWD not to be an adequate measure of that transfer. Other factors have come into effect that also affect diversions at the same time that conservation measures pursuant to the 1988 IID/MWD Agreement have been implemented. For example, double cropping has increased during the past several years, and the amount of Bermuda grass has also increased, both of which have increased water diversions from the Colorado River. As a result, IID and MWD have established a verification process to define methods and procedures to estimate/measure the amount of water being conserved by the system conservation projects constructed pursuant to the 1988 IID/MWD Agreement, which is discussed below.

Pursuant to the terms of the subsequent 1989 Approval Agreement, a five-member committee was established to oversee and direct the verification of water conserved by each individual project implemented under the 1988 IID/MWD Agreement. The-five member committee, known as the Water Conservation Measurement Committee (WCMC), consists of representatives from IID, MWD, CVWD, and Palo Verde Irrigation District (PVID) plus one unbiased outside party retained to serve as the committee chair. The WCMC began work in 1989 and continues to oversee ongoing verification activities. It is the responsibility of the WCMC chairman to annually certify the volume of water conserved to both the California State Water Resources Control Board, pursuant to Order 88-20, and to Reclamation, pursuant to their Decree Accounting responsibilities.

The effects of the 1988 IID/MWD transfer have been somewhat difficult to distinguish because IID has been able to farm more intensively and remain within its Priority 3 apportionment. Under the projected Baseline and with the enforcement of the Priority 3 entitlement (discussed below), the effects of the transfer on the Salton Sea will become easier to identify. In response to comments that average use between 1988 and 1998 by IID was below 3.1 MAFY, water use in 1997 and 1998 was near 3.1. More importantly, projected demand within the IID water service area has increased in recent years and is anticipated to continue to increase because of a number of factors, including but not limited to increased salinity in the Colorado River, requiring increased diversion to provide water for sufficient leaching.

As evidence, since 1989 (the beginning of implementation of the 1988 IID/MWD Agreement), the number of idle acre-years per year within the IID water service area has steadily declined by about 60,000 idle acre-years (1 idle acre-year is equivalent to 1 acre not being farmed during any given year). In other words, the equivalent of an additional 60,000 acres, as compared to 1989, is now being farmed within the IID water service area. The water use on these 60,000 equivalent acres (on an annual basis) has more than masked the impacts of the 1988 IID/MWD Agreement, and has in fact resulted in additional water use within the IID water service area. This increased use is often mistaken for the failure of the 1988 IID/MWD Agreement to actually conserve water, but the fact that the projects implemented under the Agreement have conserved water has been well documented by the WCMC. Without implementation of those projects, IID's actual annual water use for the years 1990-2001 would have been higher by an amount equal to the annual volume conserved for transfer to MWD, pursuant to the 1988 IID/MWD Agreement.

Entitlement Enforcement

Commenters asked for clarification of the inclusion in the projected Baseline of a reduction of inflows to the Salton Sea of approximately 56.9 KAFY, which is described as "entitlement enforcement." This adjustment was made to reflect the fact that California must conform to its normal-year apportionment of 4.4 MAFY of Colorado River water because unused entitlements from other states and surplus flows will be limited in the future. The Baseline is intended to reflect the projection of existing conditions over a 75-year period equivalent to the Project term. Existing Colorado River apportionments follow the Seven-Party Agreement, which does not provide a quantified apportionment for IID or CVWD but does quantify the aggregate apportionments of Priorities 1, 2, and 3 at 3.85 MAFY. Collectively, Priorities 1, 2, and 3 (including IID and CVWD) have historically diverted an average of 3.91 MAFY, which exceeds their 3.85-MAFY apportionment. Diversions by IID and CVWD have historically exceeded their Priority-3 apportionments (i.e., the total Priority 1-, 2- and 3-apportionment of 3.85 MAFY, minus the average of approximately 420 KAFY used by Priorities 1 and 2, PVID and the Yuma Project). The excess diversion has been possible in the past because, until recently, other Basin states were not using their full entitlements and also because surplus water was available. In the future, this will not be the case. Excess apportionments from other Basin states are not expected to be available. In addition, based upon the Record of Decision approving the Interim Surplus Guidelines, if the QSA is not implemented, these Guidelines would be suspended and surplus determinations would be based upon the 70R Strategy until California is in compliance with required reductions in water use. Reclamation has indicated that, under these conditions, use by Priorities 1, 2, and 3 would be held firmly to not more than 3.85 MAFY.

The projected demands of CVWD and IID utilized in the Baseline showed that, on average, diversions by CVWD and IID would need to be reduced by 59,210 AFY to stay within their aggregate apportionment of approximately 3.43 MAFY (3.85 MAFY minus 420 KAFY average use by Priorities 1 and 2). It was assumed that IID and its farmers could increase efficiency using temporary non-structural operations improvements rather than reduce yield to accommodate this relatively small reduction (0.059 compared to a total of 3.43 MAFY) in diversion. (A significantly greater diversion reduction could not be accommodated solely through increased efficiency.) The resulting impact to the Sea was calculated based on the predicted amount of system loss (seepage and evaporation) between the diversion point and the Salton Sea. For a diversion of 59.2 KAFY, the loss to the system is approximately 2.4 KAFY; therefore, the resulting impact to the Sea from a diversion reduction of 59.2 KAFY would be 56.8 KAFY.

The Entitlement Enforcement adjustment reasonably reflects the fact that, in the future, IID and CVWD will need to reduce their diversions to correspond with their legal apportionments even without implementation of the Project. That is, even without the proposed Project (which includes a contractual limitation on IID's diversions at 3.1 MAFY), IID's and CVWD's Priority-3 apportionment will not permit diversions at historical levels. If this adjustment were not made, the model would overstate the anticipated Baseline inflows to the Sea and would not accurately reflect physical conditions at the Sea, with or without the Project, over the term of the Project. This reduction is not offset by the proposed Inadvertent Overrun and Payback Policy (IOP), which is designed to allow phased payback of only inadvertent overruns, not excess use. The IOP is a component of the Proposed Project and is not included in the Baseline.

Additionally, commenters asked for clarification of the treatment of an amount of water (59,210 AFY) that would be used to pay back inadvertent overruns of IID's diversion cap. The Draft EIR/EIS and the model assume that over the 75-year Project term, payback requirements must be met by an average of an extra 59,210 AFY of conservation. The Draft EIR/EIS recognizes the need for this additional increment of conservation so that the total maximum impacts of the Project can be assessed. Without this adjustment, the total amount of required conservation would be underestimated.

Reduction of Inflows from CVWD

The assumption of reduced inflows from CVWD was based on the best information available, which was provided by CVWD. It was assumed in the Baseline that CVWD received no transferred water (or other new water supplies) and, as a result, would satisfy demand through the use of groundwater, continuing to deplete its aquifer for the 75-year period of the projected Baseline (which corresponds to the Project term of 75 years). Under that scenario, CVWD projects that its inflows to the Salton Sea would decline throughout the 75-year period. An alternate CVWD scenario, which assumes that CVWD would receive water from the Proposed Project, is described in a separate Master Response on *Hydrology – CVWD Scenario* in Section 3 of this Final EIR/EIS.

The Baseline sensitivity analysis (described in the following section) demonstrates that if it is assumed that CVWD inflows to the Sea reported for the year 2000 were to remain constant during the 75-year period of the projected Baseline, rather than declining as assumed for the Baseline, the year when the Sea reaches the salinity threshold for fish of 60,000 milligrams per liter (mg/L) does not change significantly.

Reduction in IID Diversions

Commenters objected to assuming in the Baseline a reduction in future diversions by IID and a resulting reduction in inflows to the Sea. The SSAM, developed and applied by Reclamation, shows a future projected baseline inflow to the Salton Sea of 1.23 MAFY based on a combination of the historical data and several factors that will affect diversions and inflows in the future. These future factors were built into the Baseline as key assumptions and are described above and below; they include the 1988 IID/MWD Agreement, entitlement enforcement, reduction in CVWD inflows, Mexico contributions that do not significantly vary from recent history, and increased salinity of Colorado River water. There is no justification for projecting a 1.34-MAFY inflow to the Salton Sea into the future based solely on the historical past. It is important to recognize that the development of the key assumptions used to generate the Baseline are a result of an extensive effort and collaboration among Reclamation, IID, and CVWD.

Salinity Increase

Commenters objected to an adjustment to the Baseline to reflect the fact that the increasing salinity of Colorado River water will require additional leaching by farmers within the IID water service area. The projected Baseline uses a salinity figure of 879 mg/L at Imperial Dam, which reflects an increase from the historical (1987–1998) average of 747 mg/L. This increase will require increased water deliveries in order to satisfy crop leaching requirements. Existing conditions on the Colorado River include and reflect a trend toward increasing salinity. This trend is controlled by the implementation by Reclamation of salinity control measures pursuant to the federal Colorado River Basin Salinity Control Act adopted in 1974. The Draft EIR/EIS uses the salinity control points established by this salinity control program to project the salinity of LCR diversions without the Project. Historical leaching amounts do not accurately reflect the likely amounts to be required under future Baseline conditions, because the salinity trend and control points mean that farmers will need to divert additional water to leach accumulated additional salts and maintain historical productivity. The commenters suggest that this adjustment degrades the Sea's existing conditions and results in an understatement of Project impacts. This adjustment does neither. Additional water for leaching is beneficial for the Sea because it increases inflows and dilutes the salinity concentration of the Sea (i.e., the leached water has a lower salinity concentration than the Sea). The Baseline sensitivity analysis below shows that if the Baseline were revised to assume no increase in salinity or a 25-year ramp-up of salinity, and therefore less leaching, the Sea would reach 60 ppt of salinity significantly sooner.

Drop in Sea Elevation

Commenters objected to the use of a Baseline elevation for the Salton Sea of –235 msl, rather than –227 to –228. Several reasonably foreseeable conditions expected under the projected Baseline each contribute to the anticipated reduction of inflow to the Salton Sea. As a result, the Salton Sea is expected to experience a 7-foot decline in elevation over a 75-year period. Details of each assumption used to evaluate the future condition are included above in items (1)-(6).

3.3.5 Effect of Modeled Baseline on Assessment of Project Impacts

We disagree with the conclusion by commenters that the projected Baseline results in a significant underestimation of Project effects. The Baseline is based on several key assumptions, which reflect our best estimate of reasonably foreseeable conditions in the future. Each of these assumptions, when isolated, changes the salinity, elevation, and area of the Sea (positively or negatively) and, when accumulated, result in the future projection of the Sea with declining elevation and increasing salinity.

If conditions projected in the Baseline without the Project did not occur exactly as projected, for example, if salinity in the Colorado River increases over a 25-year period rather than immediately as indicated in our Baseline, the mean year when the Sea reaches 60 ppt changes from 2023 to 2019. The increment of change caused by the Project in this case would be reduced, and therefore the Baseline assumptions used in the EIR/EIS would, in fact, overestimate the impacts. A "sensitivity" analysis was performed as part of the review of and response to public comments on the Draft EIR/EIS. To identify the effect of modifying the assumptions used to develop the projected Baseline, additional model runs using SSAM were completed. The changes to the key Baseline assumptions that were analyzed in the sensitivity model runs are set forth below together with the resulting projected effect on the rate at which the Sea would reach 60 ppt.

The results of the Baseline sensitivity analysis show that revising the assumptions used for the Baseline based on suggestions of commenters could change the date on which the salinity of the Salton Sea reaches 60 ppt. The range of change based on accumulated results of all of the sensitivity tests is from minus 3 years (to 2020) to plus 2 years (to 2025) from our estimation of 2023. It is important to note, however, that these changes are well within the estimated 5 percent and 95 percent confidence boundaries of 2018 to 2030 for the Baseline. The confidence boundaries refer to the range of certainty of the model predictions. The model predicted a 90 percent certainty that a salinity of 60 ppt would be reached in the Sea between 2018 and 2030 under the Baseline, with a mean of 2023. (See the Master Response on *Biology – Approach to Salton Sea Habitat Conservation Strategy* in Section 3 of this Final EIR/EIS, for an explanation on the use of confidence boundaries to develop the HCP mitigation approach for the Salton Sea.)

The Baseline sensitivity analysis suggests that the Baseline assumptions used in the Draft EIR/EIS are well within the range of accuracy of reasonable assumptions. The Baseline, therefore, provides a reasonable basis for evaluating Project impacts.

We do not agree that it is reasonable or required under CEQA or NEPA for the Project to be required to mitigate for impacts caused by other conditions, including a trend of degrading conditions. In addition, the mitigation proposed in the Draft EIR/EIS is not limited by the impact predictions. For example, the Salton Sea Habitat Conservation Strategy fully mitigates for the Project's biological impacts to the Sea by annually replacing the volume of inflow that is reduced to the Sea as a result of the Project.

3.3.6 Relationship between Baseline and No Project Alternative

Commenters also claimed that the projected Baseline was incorrectly conflated with the No Project conditions. We agree that the Baseline and the No Project Alternatives are two separate concepts under both CEQA and NEPA. As described above, the modeled Baseline was developed to simulate variable existing conditions and trends projected into the future over a 75-year period equivalent to the Project term so that Project impacts over this same time period could be compared against Baseline conditions and assessed. The No Project Alternative, by contrast, is intended to reflect existing conditions at the time of the NOP plus changes which are reasonably expected to occur in the foreseeable future if the Project were not approved, based on current plans and consistent with available infrastructure and community services [CEQA Guideline Section 15126(e)]. The No Project Alternative will frequently include foreseeable projects, and predictable actions, events, and changes that are neither existing conditions nor Project impacts. In the case of the Salton Sea analysis set forth in the Draft EIR/EIS, the projected Baseline is substantially the same as the No Project Alternative for purposes of impact analysis. That is, the well-defined trends, such as increasing salinity and declining elevation described above in connection with existing conditions, will continue under the No Project Alternative. In addition, and other projects that could affect the Sea in the future (such as the Salton Sea Restoration Project) have not been sufficiently defined, approved, funded or implemented to render their impacts foreseeable and, therefore were not included in the No Project Alternative.

Cumulative Impacts. Commenters claimed that the cumulative impacts analysis in the Draft EIR/EIS should have analyzed both past and present projects in addition to probable future projects, and that by including past and present projects in the Baseline, the cumulative impacts have been understated. The Draft EIR/EIS follows accepted practice by focusing on (1) the cumulative effects of the Project together with the effects of the list of identified probable future projects, (2) whether the Project's contribution is "cumulatively considerable," and (3) whether the Project's contribution will be mitigated. As noted in a comprehensive CEQA compliance guide, the requirement of CEQA Guidelines Section 15130(b)(1)(A) to specifically consider "past" projects is anomalous, since the EIR's discussion of the environment setting presumably will already subsume impacts caused by past projects.

The Draft EIR/EIS makes a reasonable and good faith effort to analyze cumulative effects. The Draft EIR/EIS recognizes that the significance of impacts varies with the setting, and it extensively describes past and existing conditions which create serious problems that could be exacerbated by the Project. This includes, in particular, the salinity and elevation conditions at the Salton Sea and the air quality conditions (specifically, PM10 emissions, i.e., particulate matter with a diameter of less than 10 micrometers) in an air basin which is already non-attainment. No effort has been made to understate the severity and significance of the cumulative impacts or the Project's contribution to these impacts. In addition, the QSA PEIR was designed to, and does, provide extensive information on the cumulative impacts of the QSA component projects.

TABLE 3.3-1
Sensitivity Analysis of Key Baseline Assumptions

	Assumptions Used		Year when the Sea Reaches 60 ppt Salinity (Mean Values)		
				Revised Assumption	
Sensitivity Analysis Description	**EIR/EIS**	**Sensitivity Analysis**	**EIR/EIS**	**Sensitivity Analysis**	**Difference**
Entitlement Enforcement: Reduction in Inflows to Salton Sea Changed to Historical Inflow Percentage of Total Diversions [1/]	Diversion reduction of 59.2 KAFY Farmers reduce leaching or implement short-term measures to maintain crop yields 2.35 KAFY of reduced seepage and evaporation 56.9 AFY reduction at Salton Sea	Diversion reduction of 59.2 KAFY Farmers reduce crop yields 19 KAFY reduction at Salton Sea	2023	2033	+10
No Colorado River Salinity Increase [2/]	Salinity of 879 ppm at Imperial Dam up from current level of 750 ppm IID farmers increase leaching Increase to the Sea of 42,700 AFY	No future increase in salinity at Imperial Dam No increase to the Salton Sea	2023	2017	-6
Colorado River Salinity Increase Changed to 25-Year Ramp-up [3/]	Salinity of 879 ppm at Imperial Dam up from current level of 750 ppm beginning in 2000 IID farmers increase leaching Increase to the Sea of 42,700 AFY beginning in 2000	Gradual increase in salinity at Imperial Dam from 750 ppm to 879 ppm more than 25 years Rampup of increases to the Sea from 0 to 42,700 AFY	2023	2019	-4
Term of 1988 IID/MWD Agreement Changed to end in 40 Years [4/]	1988 IID/MWD Agreement for 110 KAFY continues for 75 years 110 KAFY reduction to the Salton Sea beginning in 2000	1988 IID/MWD Agreement for 110 KAFY discontinued after 40 years 110 KAFY reduction to Salton Sea ends after 40 years	2023	2023	0

TABLE 3.3-1
Sensitivity Analysis of Key Baseline Assumptions

Sensitivity Analysis Description	Assumptions Used		Year when the Sea Reaches 60 ppt Salinity (Mean Values)		
				Revised Assumption	
	EIR/EIS	Sensitivity Analysis	EIR/EIS	Sensitivity Analysis	Difference
Maintain CVWD Groundwater and Drain Flows to the Sea at Year-2000 Level Rather than Projection of Continued Groundwater Pumping [5/]	CVWD continues to pump its wells into the future to meet increasing demands Decreasing future CVWD surface and subsurface discharges to the Salton Sea	CVWD surface and subsurface discharges remain at year 2000 levels No change to the Salton Sea	2023	2024	+1
Ramp up M&I Use By 376 AFY Rather than Holding at Most Recent 3-Year Average [6/]	Most recent 3-year average M&I use in IID water service area 10 KAFY increase to Salton Sea	17 KAF per year increase in M&I use more than 45 years Average increase to Salton Sea of 31 KAFY	2023	2025	+2
Reduce Mexico Inflows per Reclamation Estimates and Power Plant Needs [7/]	Mexico contributions are the average of the most recent 11 years plus 3 percent Increase of 28 KAFY over historic discharges to the Salton Sea	Mexico contributions from Reclamation forecast Decrease of 23 KAFY from historic discharges to the Salton Sea	2023	2019	-4
Cumulative of all of the above with No Colorado River Salinity Increase [8/]	Cumulative of all of the above	Cumulative of all of the above considering no increase in salinity at Imperial Dam	2023	2020	-3
Cumulative of all of the above with Colorado River Salinity Increase Changed to 25-Year Ramp-up [9/]	Cumulative of all of the above	Cumulative of all of the above considering 25-year increase in salinity at Imperial Dam	2023	2025	+2

TABLE 3.3-1
Sensitivity Analysis of Key Baseline Assumptions

1/ The EIR/EIS Baseline assumes that CVWD and IID and their farmers will reduce leaching water or implement other short-term measures rather than reducing their crop yields to use less water in a year when California would be limited to 4.4 MAFY. Therefore, the reduction of inflow to the Sea is equal to the reduction of diversions at the LCR diversion point less system seepage losses and evaporation between the LCR diversion point and the Sea (59,210 AFY reduction at LCR diversion point and 56,856 AFY reduction at Sea). The Baseline used in the Draft EIR/EIS assumed no reduction in crop yield. The sensitivity test shown here assumed that crop yields would be reduced and, as a result, the same diversion reduction at the LCR diversion point (59 KAFY) results in a reduction of inflows to the Sea of only 19 KAFY, which equates to an increase in projected inflows to the Sea of approximately 38 KAFY compared to the Baseline.

2/ The EIR/EIS Baseline assumes that Colorado River water salinity would immediately change from the current level of approximately 750 to 879 ppm. This assumption was derived from the recommendation of Reclamation, which used the same assumption in its CRSS. That assumption was based on the fact that the salinity target at Imperial Dam will not exceed (flow-weighted) 879 ppm using salinity control programs on the Colorado River. As a result of this salinity increase, it was assumed that the farmers would increase their leaching to maintain the level of salinity concentration in their fields at the same levels as today. This assumption resulted in an average increase of flow to the Sea of approximately 42,700 AFY. This was a field-by-field adjustment, not a constant district-wide percentage increase. The sensitivity test shown here assumed that the Colorado River salinity will not increase during the 75–year period of the projected Baseline. As a result, the Baseline assumption of a 42,700-AFY increase in Sea inflows was reduced to zero. The 'mean values' for when the Sea reaches 60 ppt represent the average year that the Sea reached 60 ppt from a thousand simulations of the Salton Sea Accounting Model.

3/ Same as described in footnote 2 above except that instead of zero salinity increase for the75-year period, the salinity was ramped up from 750 to 879 ppm more than 25 years. As a result, the Baseline assumption of a 42,700-AFY increase in Sea inflows was gradually increased from zero to 42,700 AFY over the first 25 years of the 75-year period.

4/ The EIR/EIS Baseline assumes that the 1988 IID/MWD Agreement would continue for 75 years with an associated reduction in inflows to the Salton Sea of approximately 110 KAFY. In this sensitivity test, the 1988 IID/MWD Agreement was terminated in 40 years. Therefore, for the last 35 years of the 75-year period, there would be additional inflow to the Sea of 110 KAFY.

5/ Based on information provided by CVWD, the EIR/EIS Baseline assumes that CVWD would continue to pump its wells into the future to meet increasing demands. CVWD provided subsurface (groundwater) and surface (drain) flows to the Sea based on 75 years of increased pumping. (See SSAM documentation Table 6.4 and Figure 6.1 in Appendix F of the Draft EIR/EIS for amounts of decrease in flows/salt to the Sea for 75 years). For this sensitivity test of our assumption, CVWD surface and subsurface flows to the Sea were maintained at 2000 levels for 75 years.

6/ For the EIR/EIS Baseline, average M&I use of the most recent 3 years was assumed to continue for the next 75 years. Approximately 70% of M&I use within the IID water service are ultimately flows to the Sea. The projected average demand of 120 KAF used in the Baseline results in a flow to the Sea of approximately 84 KAFY, which represents an increase of approximately 10 KAFY over historical use. For this sensitivity test, we assumed that M&I use would increase by 17 KAFY over 45 years. As a result, the inflow increase to the Sea over 75 years would be approximately 31 KAFY, rather than 10 KAFY

7/ The EIR/EIS Baseline assumes that recent (11-year average) historical inflows from Mexico would continue, plus 3%. This amounted to an increase over historical inflows of approximately 28 KAFY. For this sensitivity test, we used a Reclamation forecast of Mexico inflows less the water required for two proposed power plants. This reduced inflows by approximately 23 KAFY from long-term historical flows.

8/ All of the above sensitivity assumptions were combined into one simulation with the exception that it included the assumption of “No Colorado River Salinity Increase” rather than the “Colorado River Salinity Increase Changed to 25-Year Ramp-up.”

9/ All of the above sensitivity assumptions were combined into one simulation with the exception that it included the assumption of “Colorado River Salinity Increase Changed to 25-Year Ramp-up” rather than the “No Colorado River Salinity Increase.”

3.4 Master Response on TMDLs

3.4.1 Introduction

Imperial Irrigation District (IID) does not anticipate that implementation of the Proposed Project or Project Alternatives will interfere with implementation of Total Maximum Daily Loads (TMDLs) in the IID water service area. On-farm conservation methods may, in fact, help IID and its water users reach targets associated with the various TMDL programs.

IID and its water users intend to comply with the silt TMDLs developed for the Alamo and New Rivers as agreed to in the Basin Plan Amendment adopted by the Regional Water Quality Control Board (RWQCB), specifying compliance measures based primarily on farmer implementation of BMPs. IID has been actively involved in development of these TMDLs. In addition to working with the RWQCB on development and implementation of TMDLs that apply exclusively to rivers flowing through the IID water service area, IID is also participating with the RWQCB in formulating a nutrient TMDL for the Salton Sea and foresees a similar compliance program based on Best Management Practice (BMP) implementation.

According to discussions with the RWQCB, the proposed effort targeting selenium reduction will result in a TMDL that will be implemented throughout the Colorado River Basin and that will focus on source reduction in the Basin.

In considering the impacts of implementation of the Proposed Project and Project Alternatives in the context of TMDLs, it is important to bear in mind projections of water quality constituent concentrations and the predicted timing when concentrations of particular constituents will cross impact thresholds. To date, the TMDLs that have been approved by the SWQCB include the Alamo River Silt TMDL and the New River Pathogen TMDL. Because pathogens are not considered a constituent of concern in IID drainage water, they are not included in the Existing Setting and Impacts sections of the Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS). However, information on how the Alamo River Silt TMDL will be applied (i.e., using interim targets and the phased time periods for meeting these targets) is provided in the Draft EIR/EIS in Table 3.1-14-Water Quality Standards/Significance Criteria. The footnote at the bottom of Table 3.1-14 states that "[S]pecific measures and Best Management Practices designed to achieve the Draft TMDL requirements stipulated by the RWQCB Basin Plan are included in the IID Revised Drain Water Quality Improvement Plan."

3.4.2 Discussion of Specific TMDLs

Selenium TMDL

Correspondence from the RWQCB states that, "It is our understanding that the proposed selenium TMDL would focus on selenium throughout the upper and lower Colorado River Basin States (Colorado River Watershed), and would address selenium reduction at the sources, but could also include management practices to address concentrating of selenium in Imperial Valley."[11] This statement is consistent with the view taken in the Habitat

[11] Correspondence from Teresa Newkirk Gonzales, dated April 18, 2002.

Conservation Plan (HCP) that mitigation on the part of IID to meet numerical criteria is not practical unless it is carried out within the context of a more extensive mitigation effort. In particular, if the aquatic life criteria were reduced to 2 µg/L, this would establish a concentration criterion that is below the selenium concentration of water received by IID from the Colorado River.

Alamo River Silt TMDL

According to the Basin Plan, the Alamo River Silt TMDL is to be phased in over a period of 13 years. Modeling results from the Imperial Irrigation District Support System (IIDSS) indicate that for the Proposed Project and Project Alternatives, the 12-year, flow-weighted concentration of total suspended solids (TSS) will be below the Phase-1 TMDL numerical criterion of 320 mg/L. As more stringent TMDL numerical criteria are phased in, there is the possibility that over time these criteria would not be achieved for the Proposed Project and various Project Alternatives based on the predicted (modeled) water quality data.

The IIDSS modeling of sediment loading is not adjusted to factor in future improvements to drain water quality resulting from the application of BMPs under the TMDL because the IID Revised Drain Water Quality Improvement Plan is currently being developed, and information on how these BMPs may affect project actions is not available. Therefore, any predictions regarding the effectiveness of future BMP implementation measures, the necessity of such measures, and how they would affect the Alamo River Silt TMDL are premature at this time.

In this context, we can say that the reductions in tailwater volumes generated from on-farm conservation measures under the Proposed Project and Project Alternatives result in reductions in the mass of silt eroded from farm fields and discharged to IID drains. For this reason, the Proposed Project is expected to reduce silt loadings to the Alamo River and to contribute to the achievement of the objectives of the TMDL. The fact that tailwater reduction is the major mechanism for water conservation under the Proposed Project illustrates the parallelism between BMPs likely to be introduced under the TMDL and water conservation measures likely to be introduced under the Proposed Project. Therefore, to the extent that on-farm conservation measures are included, implementation of the Proposed Project is expected to complement implementation of the Alamo River Silt TMDL. Fallowing, by contrast, if implemented as an on-farm conservation measure, would eliminate tailwater and silt discharges from fallowed fields.

New River Silt TMDL

A silt TMDL for the New River is scheduled for consideration for adoption at the June 2002 Regional Board Meeting. As was noted with reference to the Alamo River Silt TMDL, the reductions in tailwater generated under the Proposed Project and Project Alternatives are expected to result in a decrease in silt discharge to drains in the New River Basin. The impacts of implementation of the Proposed Project on TSS concentrations in the New River would be buffered to some degree because of the silt inflows at the International Boundary. Nevertheless, the parallelism between implementation of the Proposed Project and implementation of BMPs for silt control in the Alamo River Basin would be the same in the New River Basin.

New River Pathogen TMDL

The impact of implementation of the Proposed Project and the Project Alternatives on pathogen loadings in the New River is believed to be minor because the lands and system features affected by the Project are not important sources of pathogens. Therefore, implementation of the Proposed Project is not expected to influence the nature or extent of BMPs that might be implemented to control pathogen loadings to the New River.

Nutrient TMDL for the Salton Sea

The masses and types of nutrients discharged to drains within the Salton Sea Basin are influenced by nutrient application practices and by water management. Because the Draft EIR/EIS assumes that the distribution of crops grown within the IID water service area will be identical under the Proposed Project and Project Alternatives as has been observed historically, the Proposed Project is assumed to have a neutral impact on nutrient applications except to the extent that applications would be reduced or eliminated on fallowed lands.

Under the Proposed Project, it is anticipated that much of the water conservation would be achieved through reduction of tailwater discharges. This would be expected to lead to a reduction in the mass of nutrients transported in the soluble phase by tailwater to IID drains. In addition, conservation of tailwater would reduce the mobilization of silt and lessen the mass of silt discharged to IID drains. Some nutrients, particularly phosphorus, tend to be adsorbed by fine soil particles. Therefore, a reduction in silt discharge would result in a reduction in discharge of these nutrients. Because the volume of tilewater discharged under the Proposed Project is similar to that discharged under the Baseline, it is unlikely that the mass of nutrients, particularly ammonia, that may enter IID drains through tilewater would be greatly affected by implementation of the Proposed Project or Project Alternatives. Therefore, implementation of the Proposed Project would be likely to reduce mass loading of nutrients to the Salton Sea and support BMPs introduced under a future Salton Sea Nutrient TMDL.

In general, programs such as the U.S. Department of Agriculture/U.S. Environmental Protection Agency (US EPA)-funded National Water Quality Evaluation Project[12] have recommended management of nutrient applications as the most effective measures for controlling nutrient loadings. Implementation of this type of BMP would not be influenced by the Proposed Project.

3.4.3 Data Sources

Flow and water quality data used in development of the Draft EIR/EIS were obtained from public sources. In particular, flow and water quality data on the New and Alamo Rivers were obtained from the US EPA STORET database, which includes data collected and quality controlled by IID, U.S. Geological Survey (USGS), and the RWQCB. Data used in analyses conducted for the Draft EIR/EIS were compared with data sets used in development of the Alamo River and New River Silt TMDLs and with data used in

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[12] US EPA Office of Water Regulations and Standards. 1987. Priorities, the Key to Nonpoint Source Pollution, Final Report for the Project: "Guidance Document on Targeting of NPS Implementation Programs to Achieve Water Quality Goals, Washington, D.C. July.

modeling of the New and Alamo Rivers.[13] For concurrent periods, TSS and flow data used in these three studies are identical.

Because the data used in the Draft EIR/EIS were collected by USGS, IID, and the RWQCB and were obtained from the EPA STORET database, it was assumed that agencies that had developed the data and released it to the public had applied standard collection and analysis protocols. There is no reason to question whether the data accurately represent water quality conditions at the times the samples were collected.

The Draft EIR/EIS was developed using a longer series of data than were used in development of the Alamo and New River Silt TMDLs. This longer series provides a conservative representation of TSS concentrations in the New River at the International Boundary because the long-term impact that treatment facilities in Mexico may have on silt loadings has yet to be sufficiently well established for inclusion in the Baseline of a project having a 75-year time horizon. Also, the higher average TSS concentrations at the International Boundary used in modeling for the Draft EIR/EIS (117 mg/L vs. 53 mg/L in the New River Silt TMDL) result in a smaller reduction in TSS concentrations at the outlet of the New River predicted after implementation of the Proposed Project than would have been estimated using the lower average TSS concentration adopted in the New River Silt TMDL.

In summary, although the longer time period used in development of the Draft EIR/EIS results in average TSS concentrations that are higher in the New and Alamo Rivers at both the International Boundaries and at the outlets than average values used in development of TMDLs, we do not believe these differences compromise the validity of either the Draft EIR/EIS or of the TMDLs. Data used in both analyses were developed by reputable agencies and were applied without bias. Finally, the longer time series used in analyses conducted for the Draft EIR/EIS predicts more conservative reductions in TSS concentrations resulting from implementation of the Proposed Project than would have been generated using the time period used in development of the TMDLs.

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[13] New and Alamo Rivers Project – Preliminary Data Collection and Analysis for Development of Hydrodynamic and Water Quality River Models, Prepared for the Salton Sea Authority and the State Water Resource Control Board by the Water Resources and Environmental Modeling Group of the Department of Civil and Environmental Engineering Center for Environmental and Water Resources Engineering, University of California. Davis, California. October.