THRESHOLDS OF SIGNIFICANCE FOR WATER QUALITY IMPACTS

- Violations of applicable Bay-Delta water quality objectives for surface waters
- Adverse changes to DO, DOC, turbidity or other variables that may not have specific or applicable water quality standards
- Degradation of groundwater quality caused by excessive groundwater extractions, contamination, or other causes
- Temporary decreases in water quality caused by construction activities or intermittent diversions
- Adverse changes in temperatures of waters released from storage facilities
- Adverse changes in salinities and the interface between fresh and salt water, especially in the vicinity of the entrapment zone
- Total dissolved solids (salinity), Chloride and Bromide concentration increases in Delta exports

ECOSYSTEM RESTORATION PROGRAM PLAN

The ecosystem restoration program consists of a series of actions designed to improve the quality and increase the extent of habitat for aquatic and terrestrial species in the Bay-Delta region. The habitat improvements are intended to support sustainable populations of diverse and valuable plant and animal species. The actions are organized by geographic region

DELTA REGION

A series of programatic actions are proposed for the delta. The programatic actions are listed in Table ERP-1. An initial screening was conducted to divide actions into two categories; those with minimal impacts on water quality; and those with potentially significant impacts. Actions were judged to have minimal impacts on water quality if they do not change the emission rate of pollutants or their concentration of pollutants in water bodies or if the changes they produce are clearly negligeable. The results of the screening is shown in Table ERP-1. Actions judged to have potentially significant impacts were analysed further as described below and a determination made of their significance. Where an impact is determined to be significant, mitigation measures are suggested. No mitigation measures are required when the impacts are judged to be less-than-significant.

Table 1
Ecosystem Restoration Program Plan
Programmatic Actions for Delta Region

Programmatic Action	Magnitude	Potentially Significant Environmental Impacts?
1. Restore tidal perennial aquatic habitat, and tidal emergent wetlands.	33,000 - 45,000 acres	Yes
2. Restore tidally influenced freshwater marsh.	20,000 - 25,000 acres	Yes
3. Restore tidally influenced channels and distributary sloughs.	150 - 250 miles, 900 - 2,300 acres	Yes
4. Restore shallow water habitat.	7,000 acres	Yes
5. Restore shoals.	500 acres	No
6. Create deep open water areas within restored freshwater emergent wetland areas.	500 acres	No
7. Create shallow open water areas within restored freshwater emergent wetland areas.	1,500 - 2,000 acres	No
8. Restore seasonal wetlands.	34,000 acres	Yes
9. Restore riparian habitat.	75 - 220 miles, 700 - 8,000 acres	Yes
10. Protect additional existing riparian woodlands.	500 acres	No
11. Restore non-tidal emergent wetlands.	15,000 acres	Yes
12. Restore channel islands.	200 - 800 acres	No

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ACTION 1: RESTORE TIDAL PERENNIAL AQUATIC HABITAT AND TIDAL WETLANDS

GENERAL DESCRIPTION OF ACTION

The acreage of shallow water aquatic habitat and tidal emergent wetlands will be increased by constructing setback levees, by flooding islands and by connecting dead end sloughs to delta channels. Between 33,000 and 45,000 acres of agricultural land will be converted to aquatic habitat. Most of the aquatic habitat will consist of shallow open water with emergent vegetation around its margins.

DIRECT SHORT-TERM IMPACTS

Creation of aquatic habitat will involve construction activities, principally the removal of sections of existing levee and the construction of new levees. Flooding of islands and the reconnection of dead-end sloughs will be accomplished by removal of levees. It is expected that only short sections of levee will be removed to initiate flow. The remaining portions of the no longer-useful levees will be abandoned and allowed to deteriorate and eventually disappear. Local increases in water turbidity and suspended solids content will occur during levee removal.

Some of the aquatic habitat will be created by constructing new levees behind the existing levees. Once new levees are in place the existing levees will be breached and then allowed to gradually erode. The impacts of levee construction will depend on the method of construction and the nature of the materials used. In most cases, material will have to be imported for levee construction. Possible sources of material include dredging spoils from the delta and the Bay Area. Because the source of material is uncertain the impacts associated with its excavation at the source are not discussed here. It is assumed that materials will arrive at the consstruction site by barge.

Because levee construction will occur in dry conditions, adverse effects on water quality will be less than if construction had to be undertaken within the delta channels. The new levees will be compacted, armored if necessary, and seeded. Minor and localized increases in water turbidity can be expected when the new levees are first exposed to water. Any adverse effect on turbidity could be reduced by allowing vegetation to become established on the new levees before breaching the existing levees.

Construction will have negligeable effects on other constituents of concern other than turbidity and suspended solids content. Dredged spoils may contain low concentrations of various toxic substances. Because the new levees will be built in the dry these substances will not be released to the aquatic environment during construction.

DIRECT LONG-TERM IMPACTS COMPARED TO EXISTING CONDITION

The action involves the conversion of agricultural lands on delta islands and bordering delta channels to aquatic habitat. Currently, the agricultural lands emit various substances which are discharged to delta channels. After implementation of this action, the created aquatic habitat will continue to emit various substances, but their types and quantity will be different. Table 1 indicates whether the action will change the emission of constituents of concern. Changes in emission of metals, trace elements and microbes are expected to be negligeable and are not discussed further. All other changes are discussed below.

Organics

Much of the agricultural land on delta islands and bordering delta channels is at an elevation below that of the adjacent waterways and is separated from the waterways by levees. Excess runoff and irrigation water drains from fields to perimeter ditches which flow to sumps adjacent to the levees. Runoff and agricultural drainage water is pumped over the levees and into the delta channels. The water discharged to the delta channels is fairly rich in organic matter as indicated in Table 2. The organic matter is in both dissolved and particulate form and is probably attributable to wash off of organic matter from soils, particularly peat soils, and crop residues, and from aquatic plants growing in the drainage ditches. It is estimated that the annual emission rate of DOC from lowland agricultural acreage in the delta is 12 grams/square meter. The corresponding value for upland agricultural acreage is 6 grams/square meter (1).

During the summer months, DOC content of water abstracted from the delta at Clifton Court Forebay is 1 to 3 mg/l higher than the content of Sacramento River water (2). Agricultural drainage discharges are thought to be the primary source of the increase in DOC content of waters within the delta.

Conversion of land from agriculture to aquatic habitat will change the rate of DOC emission. It has been estimated that the annual emission rate of flooded delta islands formerly used as cropland is 6 gm/square meter (3). If this estimate is accurate, then conversion of land from agriculture to aquatic habitat will half the rate of emission of DOC from sites in the delta lowlands. There will be no change in emission from sites in the delta uplands. However, experts disagree over the accuracy of the DOC emission estimates refered to above. Some have suggested that there is a considerable range of uncertainty and that conversion of agricultural land to wetlands could increase DOC emission by 10% or decrease it by up to 50% (4).

The total annual emission of DOC in agricultural drainage in the delta is estimated to be 21,250 tons (5). If it is assumed that conversion of land from agricultural use to aquatic habitat reduces DOC emission by 50% and that all the land converted to aquatic habitat is in the delta lowlands,

Table 2
Delta Island Drainage Water Quality

Constituent	Units	Webb Tract	Jones Tract	Rindge Tract
Electroconductivity	µS/cm	1,036	730	954
Chloride	mg/l	160	115	161
Bromide	mg/l	0.58	0.31	0.70
DOC	mg/l	25.1	11.3	214
THMFP	µg/l	2,150	1,287	1,963
Nitrate	mg/l	13.7	8.1	5.8

Source: DWR MWQ1 data, 1986-1991

then the annual reduction in DOC emission will be a little over 1,000 tons or about 5 % of the total. If it is assumed that conversion of land produces a 10% increase in DOC emission, then there will be an annual increase in DOC emission of 200 tons or about 1% of the total.

The change in emission of organic carbon will affect beneficial use of delta water for drinking water supply. Because dissolved organic matter is the primary precursor of trihalomethanes, a change in DOC content of delta waters will alter its suitability as a source of drinking water supply. As noted above, the DOC concentration of water at the export pumps is 1 to 3 mg/l higher than the DOC concentration in Sacramento River water. Action 1 will very slightly increase or slightly decrease the concentration of DOC at the export pumps. However, because in either case, the change in concentration will be small, the affect on the suitability of delta water as a water supply source, or on water supply practices will be minor. The other principal beneficial uses, agricultural and industrial water supply and recreational use of water would be unaffected.

Pesticides

Currently, various pesticides are used on the agricultural lands in the delta. The most commonly used pesticides are .... Samples of delta agricultural drainage taken in the early 1990s contained the following pesticides; diazanon, x mg/l; atrazin, y mg/l;............ Conversion of agricultural lands to aquatic habitat will eliminate the use of pesticides on the lands subject to this action. and thus the discharge of pesticide-contained agricultural drainage water.

Salts

Approximately, 70% of the surface area of the delta is devoted to irrigated agriculture (6). Irrigation water is drawn from the delta channels and applied to cropland. The total dissolved solids content of the applied water is usually in the range 100 mg/l to 150 mg/l. When water is applied to agricultural land, some evaporates, some is used by crops, some runs off the surface of the land and some percolates into the ground. Farmers must apply sufficient water to the land to flush the salts contained in the applied water out of the superficial soil layers. To do otherwise, would allow salt to build up in the soil with a consequent adverse effect on crop yields or the type of crops that can be cultivated.

In the delta, little runoff of applied water occurs; most of the water not evaporated or used by plants, percolates into the ground and is drained to ditches at the perimeter of the fields, from whence it is pumped back into the delta channels. The volume of drainage water is estimated to be 25 to 50% of the volume of the applied water. It is further estimated that the average salt content of drainage water is 2 to 4 times greater than that of the applied water (7).

To summarize, large volumes of water with a relatively low salt content are abstracted from delta channels to irrigate cropland. After agricultural use, considerably smaller volumes of water are returned to the channels with a much higher salt content. However, because salts cannot be allowed to accumulate in soils, the salt load in the applied water and the discharged drainage water are approximately the same and thus irrigated agriculture is not a net emitter of salts to delta waters.

If, as envisaged in Action 1, agricultural land is converted to shallow water aquatic habitat, then cropland would be replaced by open water with a fringe of emergent wetlands. The created aquatic habitat would neither take up nor emit salts. Thus, the change in land use would have no effect on the emission of salts. It would, however, have an effect on salt concentration for the reasons noted below.

The evapotranspiration rate from open water will be greater than that from the corresponding acreage of agricultural land. The estimated evapotranspiration rate for open water in the delta is 55.4 inches. The corresponding values for irrigated lands in the delta uplands and lowlands are 35.9 and 31.2 inches, respectively (8). The effect can best be illustrated with an example; a 200-foot wide, 2,000-foot long channel, confined by levees in the delta lowlands, is bordered by irrigated cropland. Under Action 1, a setback levee is built on one side of the channel, expanding its width to 600 feet. Approximately, 18 acres of irrigated agriculture is taken out of production and converted to aquatic habitat. The loss of water to evapotranspiration from the cropland was 48 acre-feet per year; the corresponding loss from the aquatic habitat is 85 acre-feet per year. The volume of water exiting the channel after the conversion of agricultural land to aquatic habitat will be less than before. As noted above, the salt load will remain the same and so the concentration of salt must increase.

Thus, the overall effect of conversion of land from irrigated agriculture to aquatic habitat is to reduce channel flow and increase salt concentration.

Nutrients

The principal nutrient in agricultural drainage water is nitrate. Phosphorus tends to become bound up in the soil and ammonia is converted to nitrate by nitrifying bacteria in the soil. Nitrate levels in agricultural drainage water are high, 25 to 50 times higher than in typical uncontaminated surface waters. Almost all the nitrate is attributable to nitrogen fertilizers applied to cropland.

Conversion of agricultural land to aquatic habitat will reduce nitrate emission. Plants in the newly created aquatic habitat will use nutrients during the growth season and release them in the form of organic nitrogen as plants die and decay. Unlike agricultural land the aquatic habitat will not be a large net exporter of nitrogen.

The acreage of land converted from agriculture to aquatic habitat under this action represents 8 % of the irrigated agricultural land in the delta. If it is assumed that the change in land use reduces the emission of nitrate from each acre of land by 98% then the total nitrate emission reduction attributable to this action is also 8%.

DIRECT LONG-TERM IMPACTS COMPARED TO NO ACTION CONDITION

The direct long-term impacts compared to the no action condition will be similar to those compared to the existing condition. The changes in emission of various substances attributable to the conversion of agricultural lands to aquatic habitat will be the same. Concentrations of the substances in the delta will be slightly altered because of the different flow regime prevailing under the No Action Condition.

INDIRECT IMPACTS

Action 1 will produce no indirect impacts on water qaulity

DETERMINATION OF SIGNIFICANCE

NOTES

1. Draft Delta Wetlands EIR/EIS, September, 1995. Appendix C4, p. C4-8.

2. Draft Delta Wetlands EIR/EIS, September, 1995. Appendix C1, p. C1-7.

3. Draft Delta Wetlands EIR/EIS, September, 1995. Appendix C4, p. C4-8. Notes that the DOC mass emission rates are somewhat uncertain.

4.

5. Calculation uses data on acreages of irrigated lands in the delta uplands (142,500 acres) and delta lowlands (342,400 acres) obtained from Tables C4-2 and C4-3 contained in the Delta Wetlands EIR/EIS. Values in short tons.

6. Data on acreages of land in the delta from Tables C4-1, C4-2 and C4-3 in Delta Wetlands EIR/EIS. Lands are classified as urban, 26,200 acres; riparian, 9,000 acres; irrigated agricultural lands, 485,000 acres; idle agricultural land and natural, 104,000 acres; and open water 54,000 acres.

7. Draft Delta Wetlands EIR/EIS, September, 1995. Appendix C2, p. C2-5.

8. Evapotranspiration data from Tables C4-1, C4-2 and C4-3 in Delta Wetlands EIR/EIS.

ACTION 8: RESTORE SEASONAL WETLANDS

GENERAL DESCRIPTION OF ACTION

The acreage of seasonal wetlands will be increased by flooding agricultural lands for several months in winter and early spring. Small berms and other water control structure will be built so that water is temporarily retained in shallow basins. The berms may be temporary or permanent. Water will be primarily supplied by rainfall but may be obtained from delta channels. Approximately, 34,000 acres of agricultural lands will be used as seasonal wetland. Crops will be grown after the land is drained in early spring.

DIRECT SHORT-TERM IMPACTS

Creation of seasonal wetlands will involve the construction of small berms and dikes. Because the terrain is so flat the berms will rarely need to be higher than 2 or 3 feet. They may be permanent or may be rebuilt each year at the end of the growing season. Berms will usually be constructed with native soils available at the site but may be built with imported materials. Because the berms will be small and will not need to withstand high water pressures they will be build with relatively light-weight construction equipment or agricultural machines.

Construction of the berms could increase the availability of sediment for discharge to water bodies. However, because the berms will be build within agricultural fields, already subject to extensive ground disturbance during cultivation, any increase in sediment erosion rates would be expected to be small. The flatness of the terrain also discourages water-caused erosion.

DIRECT LONG-TERM IMPACTS COMPARED TO EXISTING CONDITIONS

Action 8 does not involve a permanent change in land use. Instead, agricultural lands would be managed for several months each year to increase habitat value for waterfowl and other birds. Agricultural land which would otherwise be wet but not inundated in the winter and early spring would be flooded. The change in land management could produce a change in the emission rate of various substances and their concentration in water bodies.

<u>Organics</u>

<u>Pesticides</u>

Pesticide emissions are a result of agricultural use of pesticides. The winter and spring time use of agricultural land as seasonal wetlands will not alter agricultural activities on the land the reaminder of the year. There will be no change in pesticide emissions.

Salts

As noted earlier, neither irrigated agricultural lands nor wetlands are net emitters of salts. However, the concentration of salts in various water bodies may change as a result of evapotranspiration.

Nutrients

The principal nutrient emitted by agricultural land is nitrate. Almost all the nitrate is attributable to nitrogen fertilizers applied to cropland. Because crops will continue to be grown on the land managed for seasonal habitat there will be no change in nitrate emissions.

DIRECT LONG-TERM IMPACTS COMPARED TO NO ACTION CONDITION

The direct long-term impacts compared to the no action condition will be similar to those compared to the existing condition. The changes in emission of various substances attributable to the seasonal use of agricultural lands as wetlands. Concentrations of the substances in the delta will be slightly altered because of the different flow regime prevailing under the No Action Condition.

INDIRECT IMPACTS

Action 8 will produce no indirect impacts on water quality.

ACTION 10: RESTORE RIPARIAN HABITAT

GENERAL DESCRIPTION OF ACTION

Corridors of riparian vegetation will be restored along the San Joaquin River and its tributaries and along the shores of islands.

DIRECT SHORT-TERM IMPACTS

LONG-TERM IMPACTS COMPARED TO THE EXISTING CONDITION

The restoration of corridors of riparian vegetation will increase shading of stream waters. The only water quality parameter directly affected will be temperature. Water temperature in small streams where a dense canopy shades much of the water surface for thousands of feet could be reduced by several degrees (1). Water temperature in broader streams and where the riparian corridor is fragmented will be reduced by lesser amounts.

DIRECT LONG-TERM IMPACTS COMPARED TO NO ACTION CONDITION

The direct long-term impacts compared to the no action condition will be the same as those compared to the existing condition.

INDIRECT IMPACTS

Action 9 will produce no indirect impacts on water quality.

NOTES

BAY REGION

A series of programatic actions are proposed for the bay. The programatic actions are listed in Table ERP-2. An initial screening was conducted to divide actions into two categories; those with minimal impacts on water quality; and those with potentially significant impacts. Actions were judged to have minimal impacts on water quality if they do not change the emission rate of pollutants or their concentration of pollutants in water bodies or if the changes they produce are clearly negligeable. The results of the screening is shown in Table ERP-2. Actions judged to have potentially significant impacts were analysed further as described below and a determination made of their significance. Where an impact is determined to be significant, mitigation measures are suggested. No mitigation measures are required when the impacts are judged to be less-than-significant.

ACTION 1: RESTORE TIDAL PERENNIAL AQUATIC HABITAT AND TIDAL WETLANDS

GENERAL DESCRIPTION OF ACTION

The acreage of shallow water aquatic habitat and saline emergent wetlands will be increased by constructing setback levees and restoring tidal flow to 10,000 to 14,500 acres of land adjacent to Suisun Bay and Marsh, San Pablo Bay, the Napa and Petaluma Rivers and Sonoma Creek. The land to be converted is currently used for agriculture. Most of the aquatic habitat will consist of shallow open water with emergent vegetation around its margins.

DIRECT SHORT-TERM IMPACTS

Creation of aquatic habitat will involve construction activities, principally the removal of sections of existing levee and the construction of new levees. Most of the aquatic habitat will be created by constructing new levees behind the existing levees. Once new levees are in place the existing levees will be breached and then allowed to gradually erode.

The impacts of levee construction will depend on the method of construction and the nature of the materials used. Possible sources of material include dredging spoils from the delta and the Bay Area. Because the source of material is uncertain the impacts associated with its excavation at the source are not discussed here.

Because levee construction will occur in dry conditions, adverse effects on water quality will be less than if construction had to be undertaken in water. The new levees will be compacted, armored if necessary, and seeded. Minor and localized increases in water turbidity can be expected when the new levees are first exposed to water. Any adverse effect on turbidity could be reduced by allowing vegetation to become established on the new levees before breaching the existing levees.

Construction will have negligeable effects on other constituents of concern other than turbidity and suspended solids content. Even if dredged spoils, containing small amounts of toxic materials, are are used for levee construction the risk of theri release into bay waters is low because the new levees will be built in the dry.

DIRECT LONG-TERM IMPACTS COMPARED TO EXISTING CONDITION

The action involves the conversion of agricultural lands on the fringes of Suisun and San Pablo Bays to aquatic habitat. Currently, the agricultural lands emit various substances which are discharged to the bay. After implementation of this action, the created aquatic habitat will continue to emit various substances, but their types and quantity will be different. Table 1 indicates whether the action will change the emission of constituents of concern. Changes in emission of metals, trace elements and microbes are expected to be negligeable and are not discussed further. All other changes are discussed below.

Organics

Much of the agricultural land bordering Suisun and San Pablo Bays and the tidal reaches of tributary streams is at an elevation below that of the bay at high tide and is separated from it by levees. The agricultural land is of low quality and is used primarily for dry farming hay or as pasture. Little of the land is irrigated. Small acreages of irrigated pasture exist where there is a suitable water supply (*Need to check this*). Excess runoff and irrigation water drains from fields to perimeter ditches which flow to sumps adjacent to the levees. Runoff and agricultural drainage water is pumped over the levees and into the bay. The water discharged to the bay is probably similar to delta drainage water shown in Table 2.

Conversion of land from agriculture to aquatic habitat in the Bay will change the rate of DOC emission as it will in the Delta (See earlier discussion). However, changes in DOC emission are of little significance because, even in Suisun Bay, Bay waters are too saline for use as drinking water supplies.

Pesticides

Currently, pesticides are used sparingly on the agricultural lands adjacent to the Bay. The most commonly used pesticides are .... Conversion of agricultural lands to aquatic habitat will eliminate the use of pesticides on the lands subject to this action. and thus the discharge of pesticide-contained agricultural drainage water.

Salts

Conversion of agricultural land to shallow water aquatic habitat and saline emergent wetlands. will have little effect on the emission of salts. It could, however, have some effect on salt concentrations in the bay for the reasons noted below.

The evapotranspiration rate from open water will be greater than that from the corresponding acreage of agricultural land. The estimated evapotranspiration rate for open water in the north bay is -- inches. The corresponding value for dry farmed hay fields is -- inches. The increase in evapotranspiration on the fringes of the North Bay is unlikely to have much effect on the salinity of bay waters because the area involved in the land conversion is small relative to the Bay's surface area.

Nutrients

DIRECT LONG-TERM IMPACTS COMPARED TO NO ACTION CONDITION

The direct long-term impacts compared to the no action condition will be similar to those compared to the existing condition. The changes in emission of various substances attributable to the conversion of agricultural lands to aquatic habitat will be the same.

INDIRECT IMPACTS

Action 1 will produce no indirect impacts on water qaulity

DETERMINATION OF SIGNIFICANCE

NOTES

ACTION 10: RESTORE RIPARIAN HABITAT

GENERAL DESCRIPTION OF ACTION

Riparian vegetation and riverine aquatic habitat will be restored along the Napa and Petaluma Rivers, Sonoma Creek and along waterways in Suisun Marsh. Ten to fifteen miles (*should this be 40 to 60 miles- disagreement between sources*) will be restored. Restoration procedures will depend on circumstances at a particular site. Restoration in stream reaches without levees or riprap would involve clearing of non-native vegetation, minor regrading and replanting with appropriate native species. Depending on the characteristics of the adjacent land use, fencing of the riparian area to exclude livestock may be necessary.

DIRECT SHORT-TERM IMPACTS

LONG-TERM IMPACTS COMPARED TO THE EXISTING CONDITION

The restoration of corridors of riparian vegetation will increase shading of stream waters. The only water quality parameter directly affected will be temperature. Water temperature in small streams where a dense canopy shades much of the water surface for thousands of feet could be reduced by several degrees (1). Water temperature in broader streams and where the riparian corridor is fragmented will be reduced by lesser amounts.

DIRECT LONG-TERM IMPACTS COMPARED TO NO ACTION CONDITION

The direct long-term impacts compared to the no action condition will be the same as those compared to the existing condition.

INDIRECT IMPACTS

Action 9 will produce no indirect impacts on water quality.

NOTES

LEVEE SYSTEM INTEGRITY PROGRAMMATIC ACTIONS

GEOGRAPHIC AREA-DELTA

ACTION 1: REHABILITATE EXISTING LEVEES TO PL-99 STANDARDS

GENERAL DESCRIPTION OF ACTION

The waterside of levees will be armored with riprap to ensure stability; some levees also will have waterside and/or landside berms that will add stability and provide wildlife habitats and opportunities. The action will be conducted on 1100 total miles of levees which and will result in about 10,000 to 15,000 acres of PL-99 levees. It is currently assumed that the existing levees to be rehabilitated cover approximately 7500 to 11,250 acres, so this action will increase the total area of levees by about 2500- 3750 acres.

DIRECT SHORT-TERM EFFECTS

Construction of berms and installation of rip-rap on the waterside of the levees will resuspend some borrow material and possibly some levee sediments, creating a small turbidity plume in and downstream of the berm construction area. Existing suspended sediment concentrations in the Delta range from 20 mg/l during low flow conditions to over 1000 mg/l during high flows (Draft ISDP EIR/EIS, 1995), and the effects of a short-term localized increase in turbidity and suspended solids is not considered significant in the context of the large natural variability in the system.

Constituents that tend to be associated with the sediments (e.g., metals) will also be resuspended; however data on the levels of concentrations of metals of concern in levee sediments (Table 4-3, Draft ISDP EIR/EIS, 1995) indicate that concentrations are generally below sediment guidelines developed by the San Francisco Regional Water Quality Control Board for wetland creation and upland reuse (reference).

DIRECT LONG-TERM IMPACTS COMPARED TO EXISTING CONDITIONS

Organics

The creation of berms on the waterside of the levees and widening of the levees to meet PL-99 standards will result in a conversion of about 2500-3750 acres of agricultural lands to wider levees that, depending on specific design features, may provide for additional shallow water habitat and/or riparian habitat. It is assumed that most of the conversion would be to riparian habitat which would result in a net decrease in DOC loading to the Delta. Given the limited acreage of land conversion involved, the reduction is not considered significant in affecting the DOC levels in the Delta and at the export facilities.

Salts

When water is diverted from the Delta and applied to agricultural land, some of it is released to the atmosphere through evaporatranspiration, some percolates into the ground, flushing salts from the surficial sediments, and some excess flows enter the tailwater sections of fields. Percolated water and tailwater are collected in subsurface agricultural drains and returned to the Delta via pumps. The volume of the drainage water is estimated to be 25% to 50% of the applied water and the average salt content of drainage water is 2 to 4 times greater that that of applied water (Appendix C2, page C2-5, Draft Delta Wetlands EIR/EIS, 1995). The net effect of this is that, although the salt load in the diverted and return flows are comparable, irrigated agriculture, by diverting and reducing flows, causes salt concentrations in the Delta to increase.

The effect of conversion of agricultural lands to shallow water habitat and riparian habitat depends on amount of evapotranspiration resulting under the Action compared to existing conditions. Evapotranspiration from open water (which would reflect shallow water habitat) is estimated to be about 55 inches per year whereas evapotranspiration from cropland is approximately 30-35 inches per year (Tables C4-1, 4-2,4-3Delta Wetlands EIR). However, it is assumed that the Action primarily will result in riparian vegetation whose net water demands will be less than that of current agricultural crops. Given this, the Action is likely to result in a decrease in salinity loads to the Delta. The amount of this decrease will be small given the relatively small acreage involved.

Pesticides
(Go over Revital's data before completing this section - specifically address pesticide levels in return flows)

Nutrients