Appendix I
Habitat Evaluation

Date: July 8, 2009

To: Jacob McQuirk, Project Manager, California Department of Water Resources

From: Charyce Hatler, Environmental Specialist, California Department of Water Resources

Subject: Delta-Mendota Canal Recirculation 2008 Pilot Study Habitat Evaluation

In late July 2008, Department of Water Resources San Joaquin District Environmental Scientists (ES) were asked to participate in a Newman Wasteway (Wasteway) site visit. The purpose of the visit was to obtain an overview of habitat conditions at the Wasteway prior to the release of recirculation flows as part of the 2008 San Joaquin River Recirculation Project Pilot Study. Other site visit participants included staff from the United States Bureau of Reclamation (Reclamation) and from the San Luis and Delta-Mendota Water Authority (SLDMWA).

The July site visit was the first in a series of three. ES staff was asked to evaluate the effect recirculation flows might have on habitat in the Wasteway. The following habitat evaluation is comprised of field notes, supported by photo documentation. For adequate environmental impact analysis, a complete habitat evaluation would need to be conducted, including formal vegetation community classification, plant and animal surveys, habitat mapping, and wetland delineation.

July 25, 2008

The site visit began at approximately 9:30, and like the following two visits, started on the Wasteway at the Delta-Mendota Canal (DMC) gates. Both headgates were closed, and flow was limited to seal leaks that allowed water from the DMC to enter the Wasteway. Raven (*Corvus corax*) nests (M. Walsh pers. comm.), were located immediately downstream of both gates. Neither nest was in use, but looked as if they might have been used within the last year. Also immediately downstream of the north gate was a vacant swallow nest. Several kinds of aquatic vegetation were identified downstream of the gates including algal mats, *Juncus* sp. (rush), *Ludwigia hexapetala* (water primrose), and *Sorghum halepense* (Johnson grass) (Photo 1A). Several small, unidentified fish were observed.

At Eastin Road, there contained algal mats, and sparse clumps of Johnson grass near the water's edge (no photo at this site). Northern Mockingbirds (*Mimus polyglottos*) and Western Kingbirds (*Tyrannus verticalis*) were observed.

Downstream of the Main Canal, at the end of the Wasteway's concrete lining, vegetation consisted of dense clumps of *Typha* sp. (cattail), *Carex* sp. (sedge), *Brassica* sp. (mustard), *Cirsium* sp. (thistle), *Juglans Californica* (California black walnut), *Baccharis* sp., *Mentha* sp. (mint), water primrose, and volunteer almond trees from the adjacent orchard (Photo 3A).

Approximately 75 feet downstream from the end of the concrete lining, the streamflow split around an island vegetated with *Asclepias* sp. (milkweed), cattail, black walnut, thistle, Baccharis, water primrose, and Johnson grass (Photo 4A). The stream rejoined below the island, but separated, again, about 50 feet downstream. This time, the streamflow diverged around one small, and one larger, island. These islands were vegetated with *Plantago* sp. (plantain), *Salix* sp. (willow), rush, and thistle. Willow and rush also grew along the toe of the right bank (Photo 5A). A Bullfrog, and small, unidentified fish, were observed in the water. Kingbirds, swallows, and Red-winged Blackbirds (*Agelaius phoeniceus*) flew in the area, and perched on vegetation. A beaver dam was identified in this location.

Habitat in the Wasteway looking downstream towards Draper Road, was largely the same as the habitat upstream near the beaver dam (Photo 6A).

Vegetation in the Wasteway upstream of Draper Road contained *Rumex* sp. (dock), cattail, thistle, *Baccharis*, mustard, and sedge. Red-winged Blackbirds and swallows were observed (Photo 7A). The Wasteway channel downstream of Draper Road contained quite a bit of vegetation, and it was difficult to see the water (Photo 8A). Vegetation included rush, thistle, cattail, plantain, and mustard. This site also contained illegally dumped household items.

Downstream of the culvert bridge below Draper Road, vegetation consisted of Baccharis, rush, dock, cattail, and willow. In this location, water primrose covered most of the water surface of the channel (Photo 9A).

Upstream on the Wasteway from Upper Road, the levee toes were lined with cattail, rush, willow, and *Baccharis*. In this location, the water channel was so full of water primrose and *Eichhornia crassipes* (water hyacinth), that it appeared to be covered with a green carpet (Photo 10A). Facing downstream from Upper Road, the vegetation was similar, but the water channel was wider and not as dense with water primrose and water hyacinth (Photo 11A).

Upstream of the culvert bridge at the Wasteway and Highway 33, vegetation consisted of cattail, dock, *Baccharis*, rush, sedge, willow, water primrose, and several unidentified plant species (Photo 12A). There was evidence of a beaver dam.

At the Wasteway bend, the water channel widened, and vegetation primarily consisted of water hyacinth and cattail (Photo 13A). A Great Blue Heron (*Ardea herodias*) was observed.

Downstream of the Wasteway bend, looking towards Braza Road, vegetation consisted of water hyacinth, *Baccharis*, cattail, willow, rush, thistle, and water primrose (Photo 14A). A Great Blue Heron, and a Great Egret (*Ardea alba*) were observed.

Facing upstream from the bridge near the treatment ponds, the water channel was narrower, and the water was swifter than on the downstream side. On the upstream side

were cattail, rush, dock, plantain, willow, thistle, water primrose, *Xanthium* sp. (cocklebur), and some unidentified plant species (Photo 15A). The water channel downstream from this bridge was wider and slower. Downstream vegetation was sparse and consisted primarily of water hyacinth, Johnson grass, and contained considerably more cocklebur than was found on the upstream side (Photo 16A).

Approximately 300 yards upstream of the confluence with the San Joaquin River, the Wasteway's water surface was clear of vegetation, and the banks were lined with sedge, rush, cattail, mustard, cocklebur, and some unidentified plant species. At this location, only small amounts of water hyacinth and water primrose were seen (photo 17A). Large carp swam in the water.

At the confluence with the San Joaquin were willow, rush, dock, cattail, and some water hyacinth (Photo 18A). A suspended sediment plume from the Wasteway entered the San Joaquin at the confluence (Photo 19A).

September 4, 2008

This site visit began at approximately 10:00 and was attended by Reclamation, SLDMWA, and DWR staff. Both DMC gates were open, and the estimated flow was 260 cfs (M. Walsh pers. comm.). Downstream of the gates, the nests were still in tact, but the only vegetation observed was a small, submerged patch downstream of the north headgate (Photo 1B).

At Eastin Road, the water elevation under the bridge was about 1.8 feet, and the vegetation observed at this location during the July 25 visit was no longer present (Photo 2B).

Downstream of Main Canal, at the end of the Wasteway's concrete lining, the water channel appeared wider and more braided than on the July 25 visit. While most of the plant species observed during the July 25 visit were still intact, the amount of water primrose was greatly reduced (Photo 3B).

Approximately 75 feet downstream from the end of the Wasteway's concrete lining, the water channel split around an island, as before, and the vegetation appeared to have the same diversity and density as it did during the July 25 visit (Photo 4B). The water channel rejoined below the island, but the beaver dam had been washed out, and a significant amount of vegetation was gone (Photo 5B).

Habitat in the Wasteway looking downstream towards Draper Road was largely the same as it was during the July 25 visit, except that some of the vegetation had been cleared by the flows, increasing the water surface area (Photo 6B).

The Wasteway upstream of Draper Road looked considerably different than it did on the July 25 visit. Most of the vegetation was removed by the flows, leaving sparse clumps of sedge, rush, and cattail (Photo 7B). Habitat downstream from Draper Road was also

considerably altered. Vegetation along the left bank had been cleared by the flow, and water was clearly visible in comparison to the July 25 visit (Photo 8B).

Downstream of the culvert bridge below Draper Road, vegetation was cleared, or inundated, by the flows. A few stands of rush and sedge remained. There was little evidence of the water primrose and water hyacinth that were abundant on July 25 (Photo 9B).

Facing upstream on the Wasteway from Upper Road, the water hyacinth and water primrose that carpeted the water surface on July 25 were gone. Little of these plants remain in the channel, and much of the other vegetation appears dead (Photo 10B). The water channel was wider than on July 25. Downstream from Upper Road, the water channel was also wider, and had much less water hyacinth and very little water primrose. Most of the cattail looked dead (Photo 11B).

Upstream of the culvert bridge at the Wasteway and Highway 33, quite a bit of vegetation and sediment was removed by the flows. Most of the water primrose that was at this location on July 25, had been removed by the flows, but there was more water hyacinth. Some cattail, sedge, and rush remained in the channel (Photo 12B).

At the Wasteway bend, the water channel was more open than on July 25, but more water hyacinth had accumulated. The cattail and rush that was previously at this site are no longer abundant, and the cattail seemed to be dying (Photo 13B).

Downstream of the Wasteway bend, looking towards Braza Road, the channel was more open than it was on July 25. Little water primrose was evident, but there appeared to be more water hyacinth (Photo 14B).

Upstream of the bridge near the treatment ponds, the channel was wider than on July 25, quite a bit of vegetation had been removed by the flows, cattail were submerged, and water hyacinth had piled up against the right bank (Photo 15B). The channel downstream of this bridge was considerably wider than it was during the previous visit, and sediment and vegetation had been removed by the flows, especially on the right bank (Photo 16B).

Approximately 300 yards upstream of the confluence with the San Joaquin River, habitat in the area was largely the same as it was on July 25, except that water hyacinth had begun to collect on the shoreline (Photo 17B).

At the confluence of the San Joaquin, habitat is the same as it was on July 25 with the exception that there was less exposed beach, and that water hyacinth had accumulated on the shoreline near the confluence and along the left bank of the San Joaquin (Photo 18B). The suspended sediment plume from the Wasteway extended further into the San Joaquin than it did on July 25 (Photo 19B).

September 29, 2008

This site visit began at approximately 9:00 and was attended by Reclamation, SLDMWA, and DWR staff. Both headgates were closed, although seal leaks allowed some DMC water to enter the Wasteway. The vacant nests were still intact, but the only vegetation in the channel was small algal mats and submerged, dead remnants of the plants observed on July 25 (Photo 1C).

At Eastin Road, the water level had dropped considerably, and no vegetation was observed near the water (Photo 2C).

Downstream of Main Canal, at the end of the Wasteway's concrete lining, sediment terraces were exposed on the right and left sides of the channel and vegetation had collapsed into the water on the right bank (Photo 3C). Small, unidentified fish, and a frog or toad, were observed (Photo 3C.2).

The area approximately 75 feet downstream from the end of the Wasteway's concrete lining, appeared the same as it was on September 4, except there was some exposed sediment on the island, and the willows seemed greener and healthier (Photo 4C). Where the streamflow rejoined downstream of the island, the habitat looked quite different than it did on September 4. There was quite a bit of exposed sediment in the channel, and the sediment was bare except for a few clumps of established grass and some newly sprouting grasses. The cattail in this area was still green (Photo 5C).

Habitat in the Wasteway looking downstream towards Draper Road appeared the same as it did on September 4 except for some exposed sediment, and dead, submerged cattail (Photo 6C).

Wasteway habitat upstream of Draper Road was significantly different than it was on July 25 and September 4. Only a remnant water channel remained, bordered by exposed sediment, especially on the right bank (Photo 7C). A Great Egret, Great Blue Heron, and Cattle Egret (*Bubulcus ibis*) were seen foraging near the water. Habitat downstream of Draper Road was also considerably altered. Quite a bit of sediment was exposed, especially along the left bank, and dead, flattened cattail and other vegetation lie on the sediment along with accumulated trash (Photo 8C).

Downstream of the culvert bridge below Draper Road, the water had returned to its original configuration, and was bordered by exposed sediment and dead vegetation (Photo 9C). Instream vegetation downstream of this location also appeared dead.

Upstream of Upper Road, the condition of the area was similar to the way it was on September 4, except that more of the cattail were dying, and some of the water hyacinth was dying where the bank was drier (Photo 10C). The water channel downstream from Upper Road was narrower, and vegetation along the banks appeared dead or dying (Photo 11C). Small fish were observed.

Upstream of the culvert bridge at the Wasteway and Highway 33, sediment was exposed on the left and right banks, the cattail and rush were still green, and some of the water hyacinth had died, but most of it persisted (Photo 12C).

The area at the Wasteway bend was largely dewatered compared to September 4 conditions. Quite a bit of vegetation had died, including some of the water hyacinth, but according to SLDMWA staff, the amount of hyacinth present was the most he'd ever seen (M. Walsh pers. comm., Photo 13C).

Downstream of the Wasteway bend, looking towards Braza Road, the right bank had more exposed sediment, and much of the aquatic vegetation was dying. However, there was more water hyacinth than on September 4 (Photo 14C).

Upstream of the bridge near the treatment ponds, there was exposed sediment on both banks and dead, flattened vegetation. Some of the cattail in the area had died, and the rest was still green. The accumulated water hyacinth remained, and there was evidence of a beaver dam (Photo 15C). A small frog was swimming in the water. The water channel downstream of the bridge near the treatment ponds had returned to about the same configuration it had on July 25, but there was exposed sediment on the right bank. Some of the water hyacinth had died (Photo 16C). Small fish, crawdads, and frogs were in the water.

Approximately 300 yards upstream of the confluence with the San Joaquin River, habitat appeared the same as it was on September 4 except that there was more exposed shoreline on both banks (Photo 17C).

At the confluence with the San Joaquin, habitat appeared the same as it was on September 4 except there was more exposed shoreline on both banks of the Wasteway and on the right bank of the San Joaquin (Photo 18C). While the turbidity plume from the Wasteway wasn't very distinct, even compared to the way it looked on July 25 (Photo 19C), the Wasteway itself appeared stagnant and shimmered with air bubbles (Photo 20C). Small fish were in the water, and dead and live water hyacinth lined the right bank. Raccoon and canid footprints were observed.

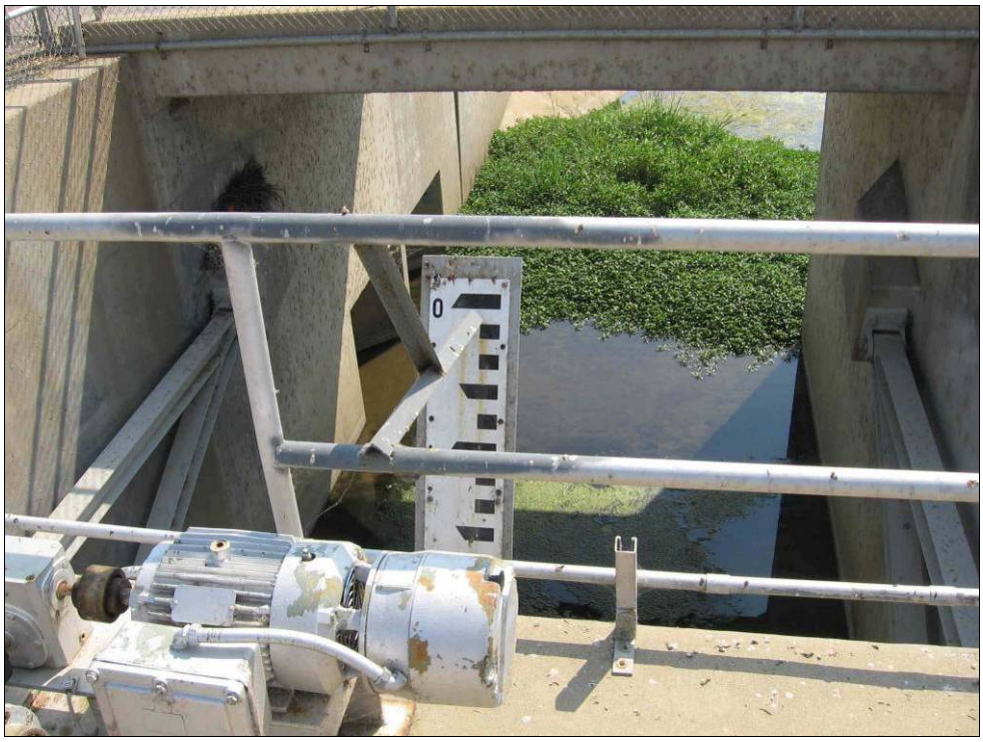

Photo I-1. 1A Wasteway Downstream of North DMC Gate

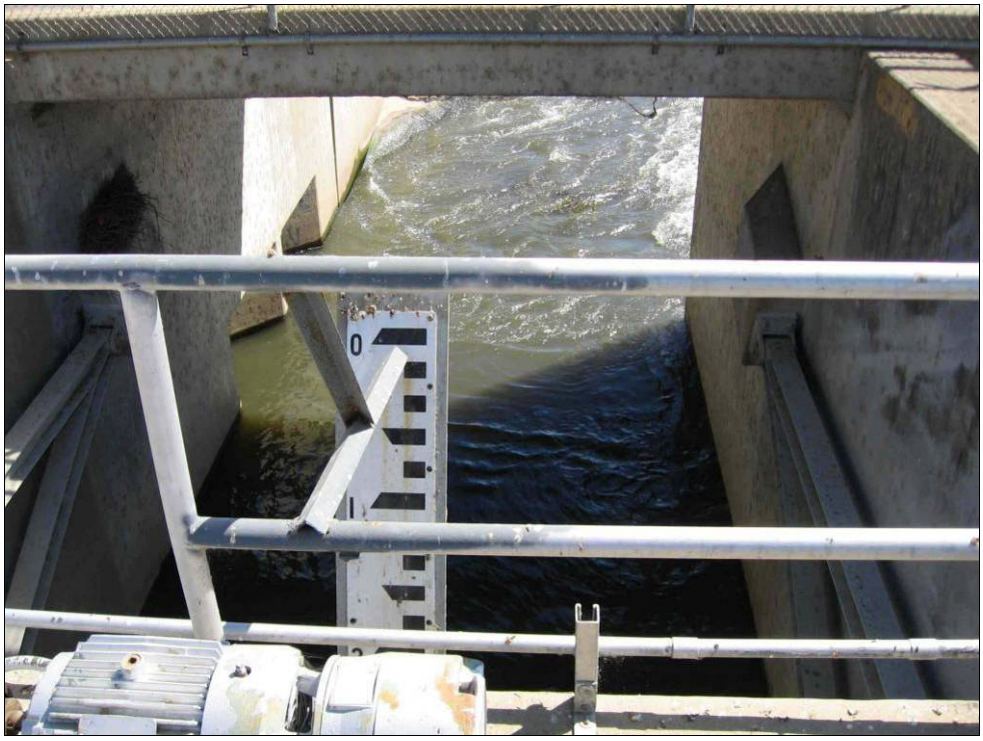

Photo I-2. 1B Wasteway Downstream of North DMC Gate

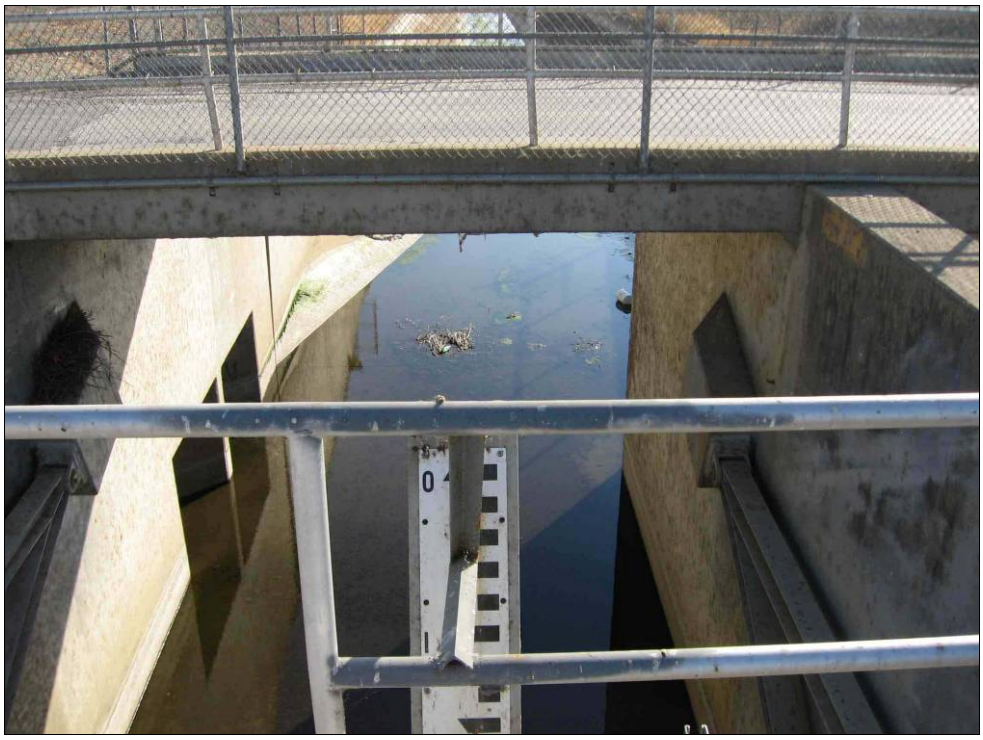

Photo I-3. 1C Wasteway Downstream of North DMC Gate

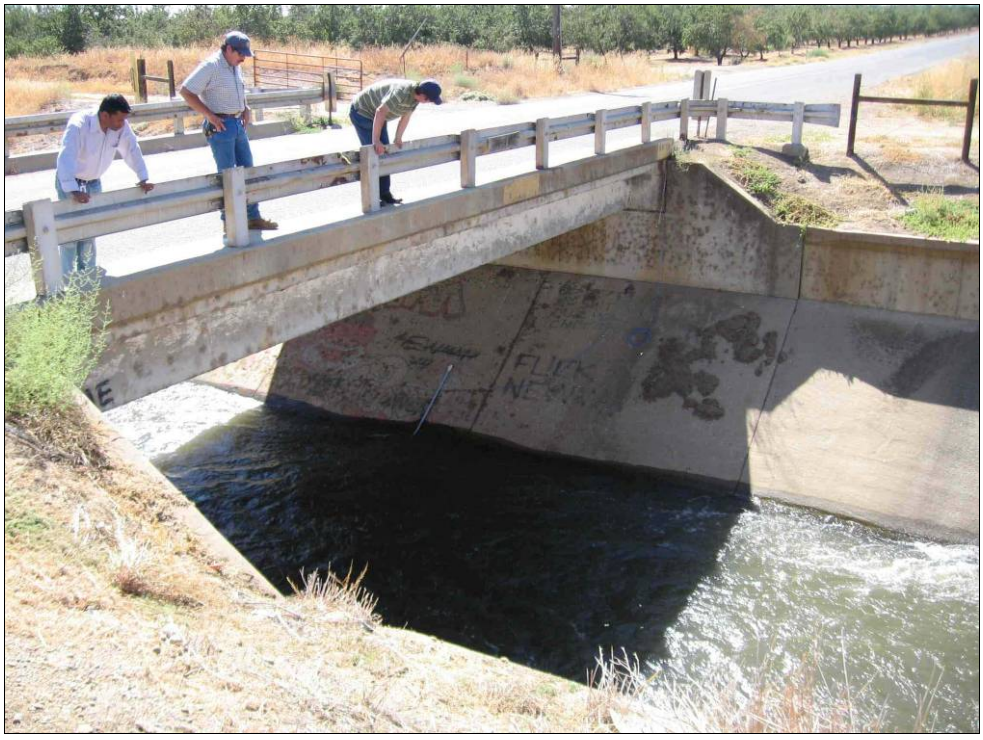

Photo I-4. 2B Wasteway at Eastin Road

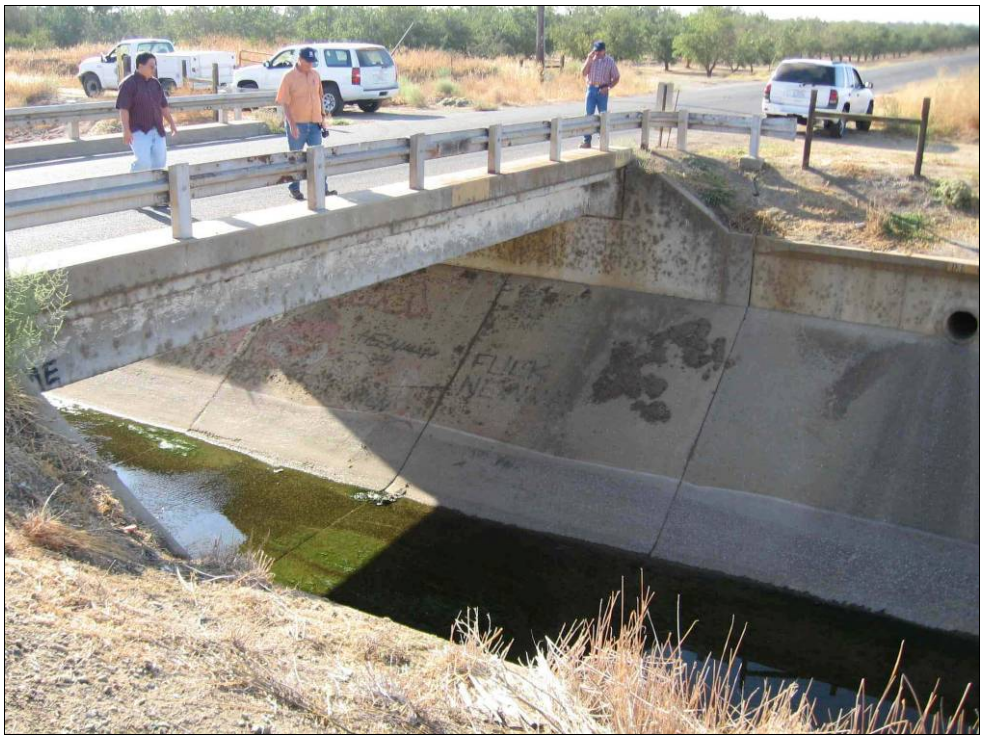

Photo I-5. 2C Wasteway at Eastin Road

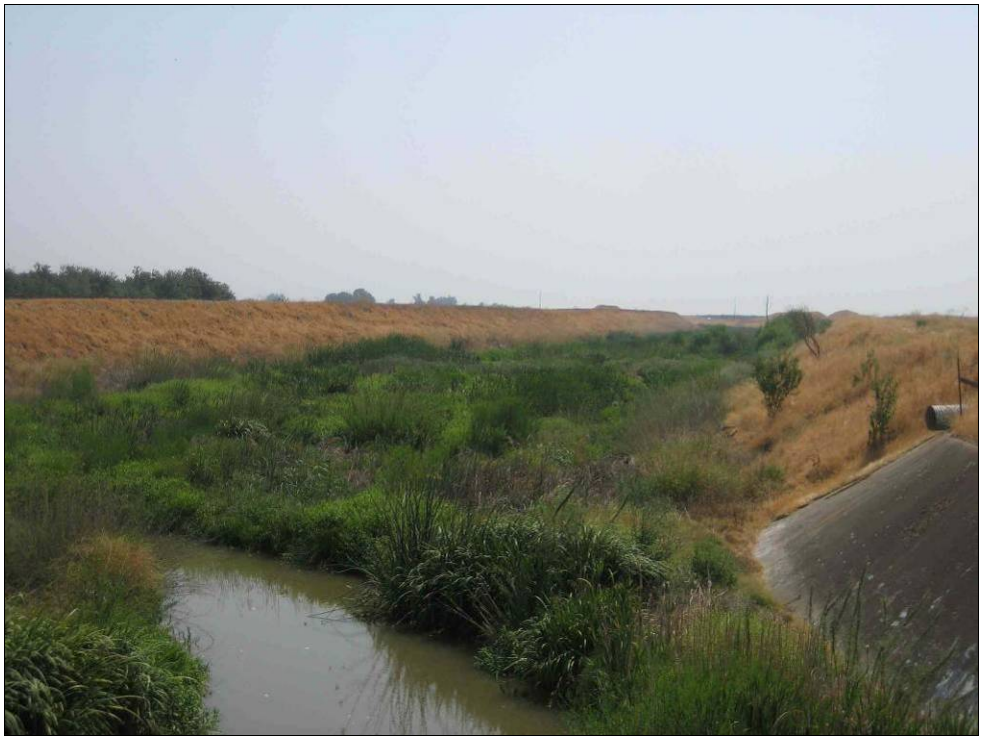

Photo I-6. 3A Wasteway Downstream of Main Canal

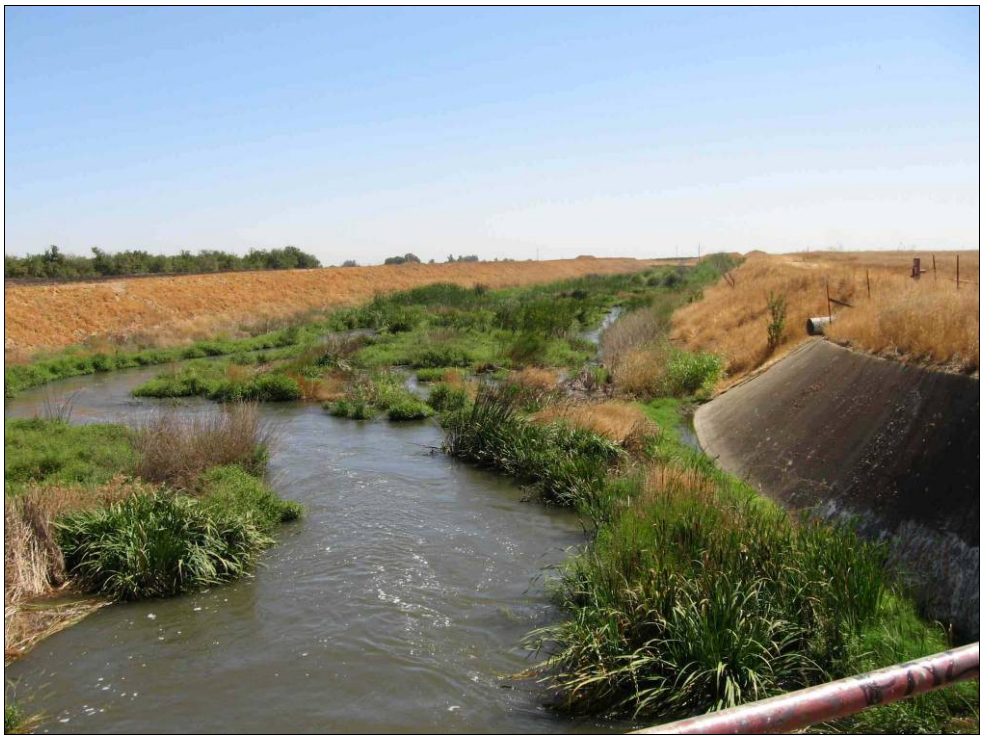

Photo I-7. 3B Wasteway Downstream of Main Canal

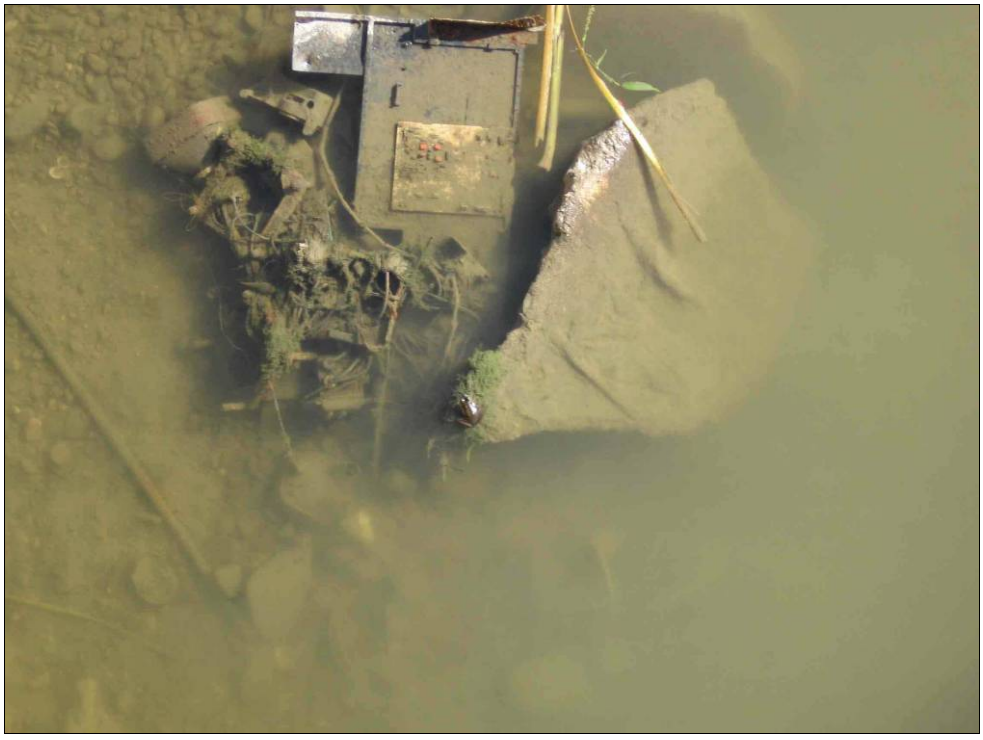

Photo I-8. 3C.2 Debris in Wasteway Downstream of Main Canal

Photo I-9. 3C Wasteway Downstream of Main Canal

Photo I-10. 4A Wasteway 75 ft Downstream from Concrete Lining

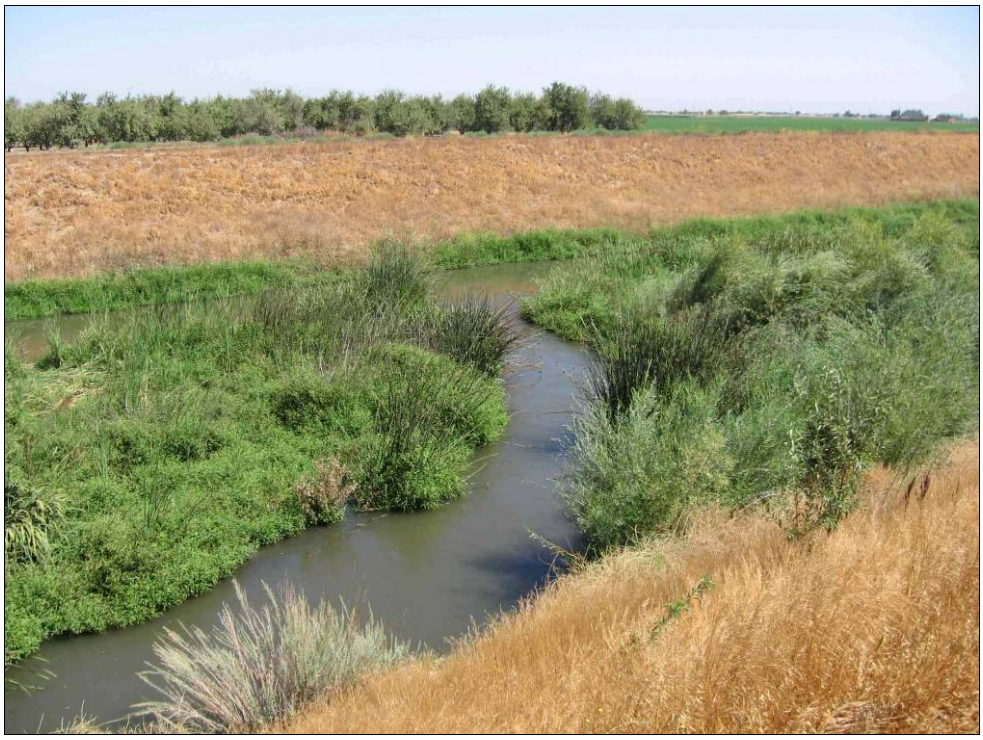

Photo I-11. 4B Wasteway 75 ft Downstream from Concrete Lining

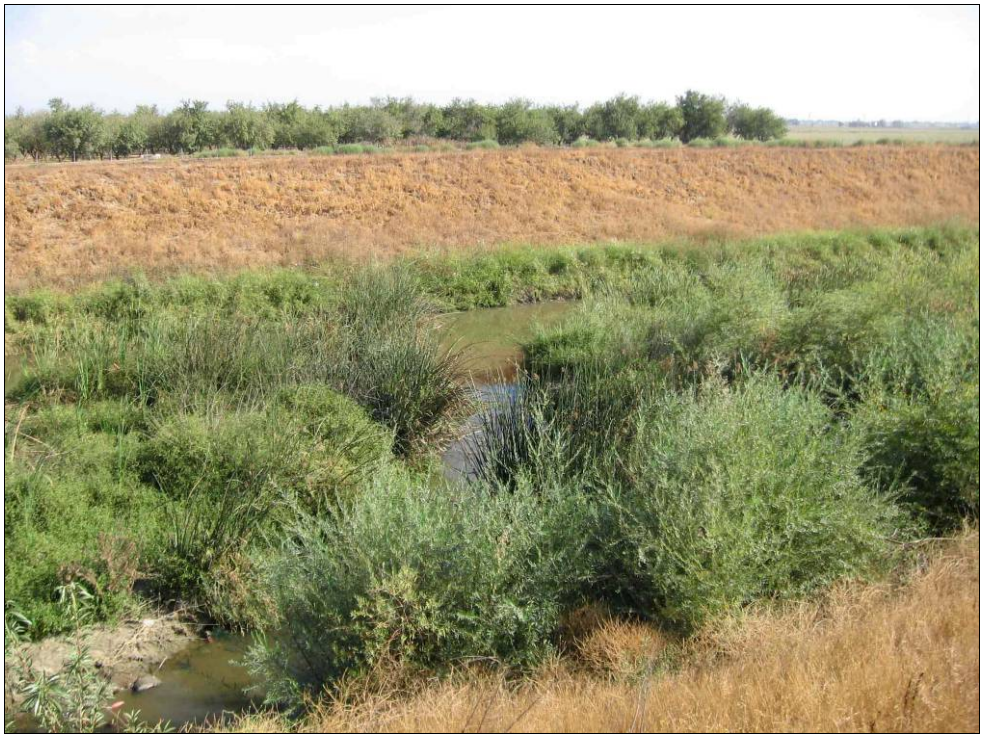

Photo I-12. 4C Wasteway 75 ft Downstream from Concrete Lining

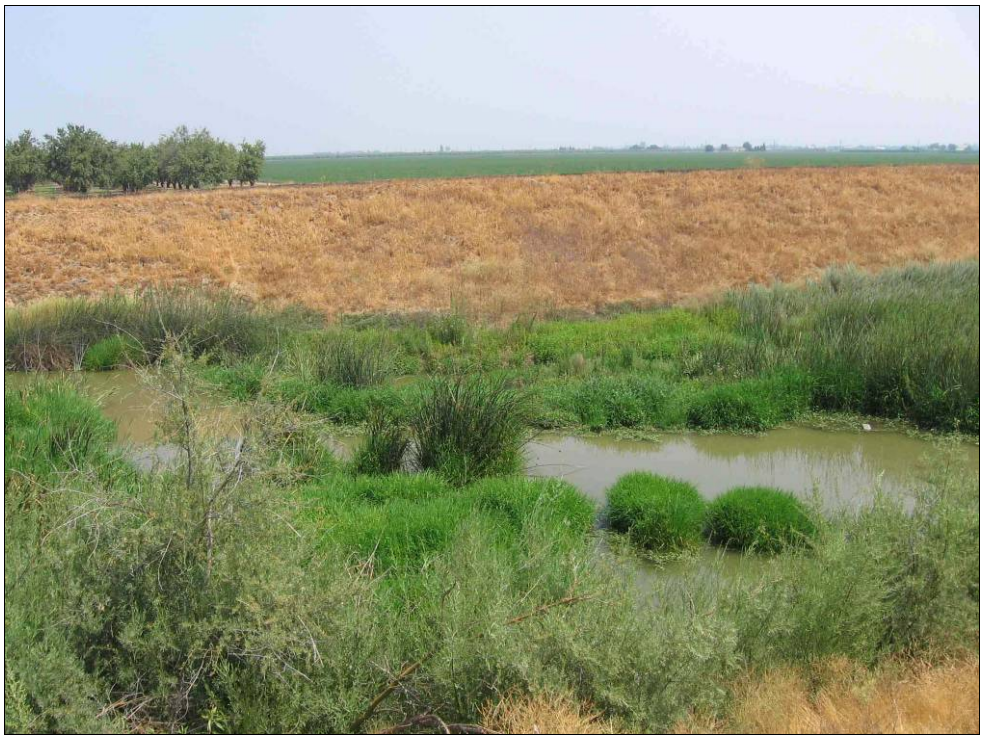

Photo I-13. 5A Wasteway 125 ft Downstream from Concrete Lining

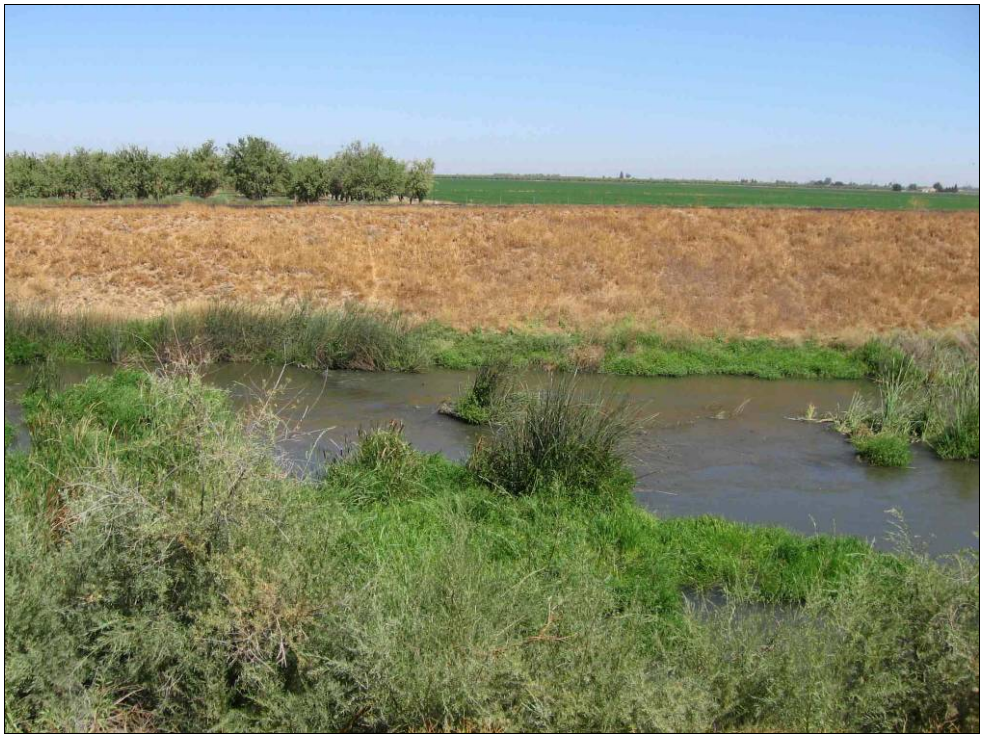

Photo I-14. 5B Wasteway 125 ft Downstream from Concrete Lining

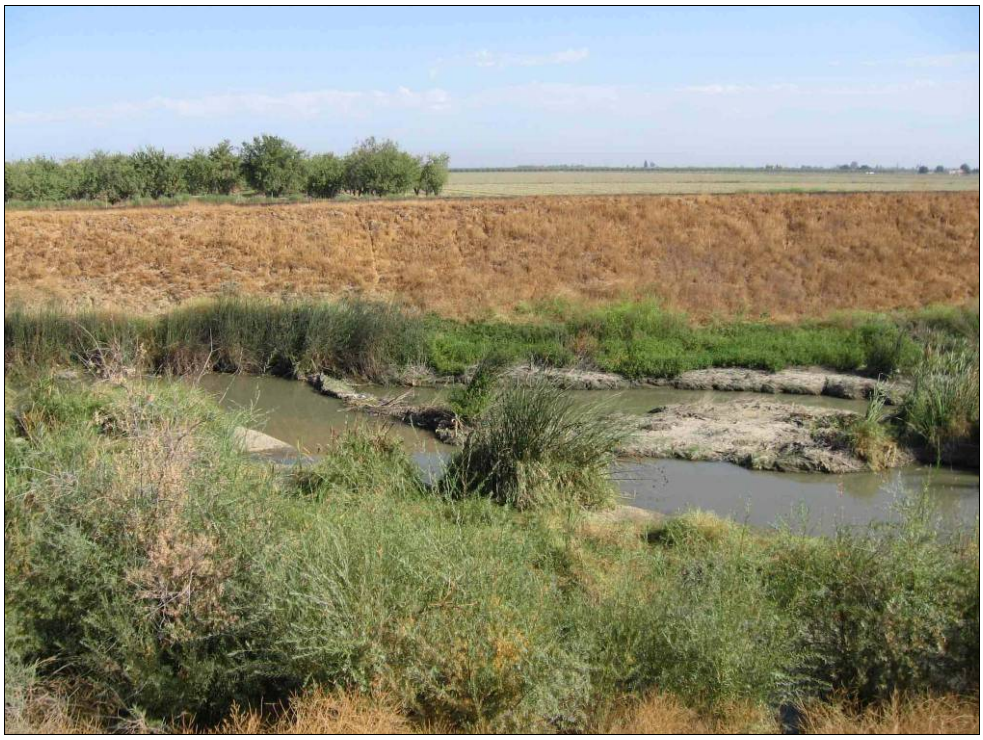

Photo I-15. 5C Wasteway 125 ft Downstream from Concrete Lining

Photo I-16. 6A Wasteway looking Downstream towards Draper Road

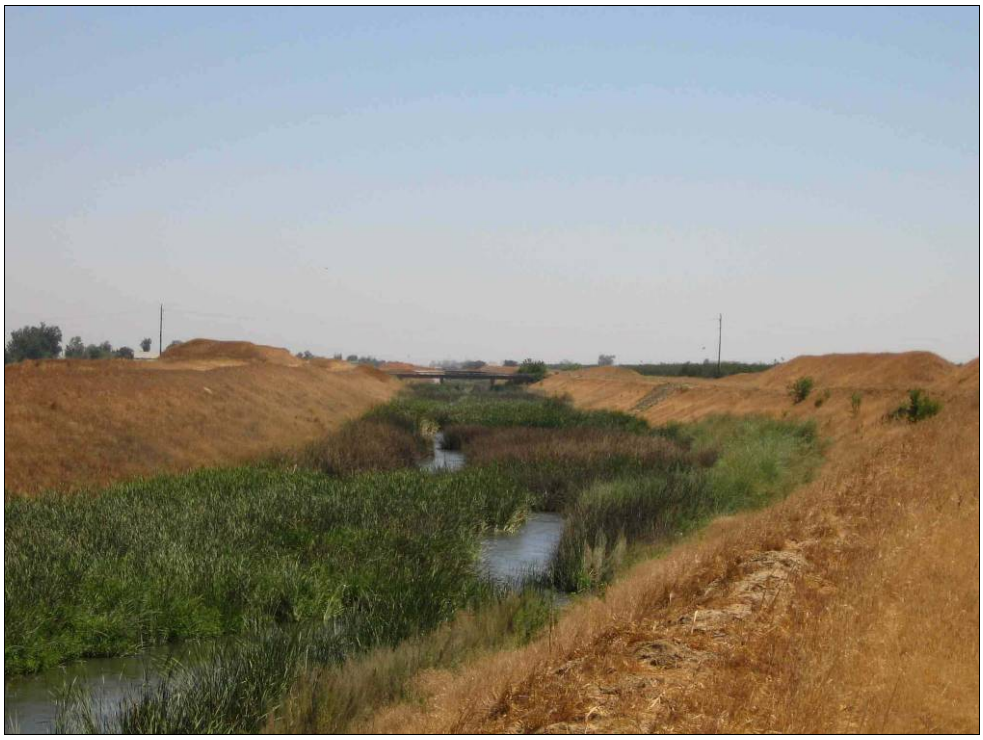

Photo I-17. 6B Wasteway looking Downstream towards Draper Road

Photo I-18. 6C Wasteway looking Downstream towards Draper Road

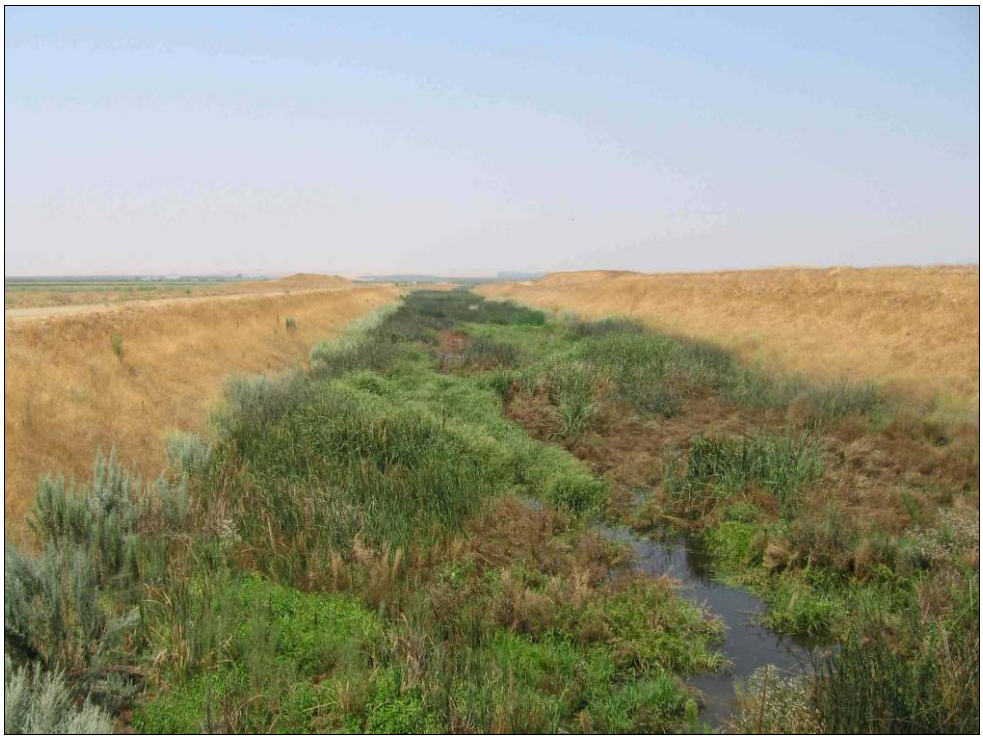

Photo I-19. 7A Wasteway looking Upstream from Draper Road

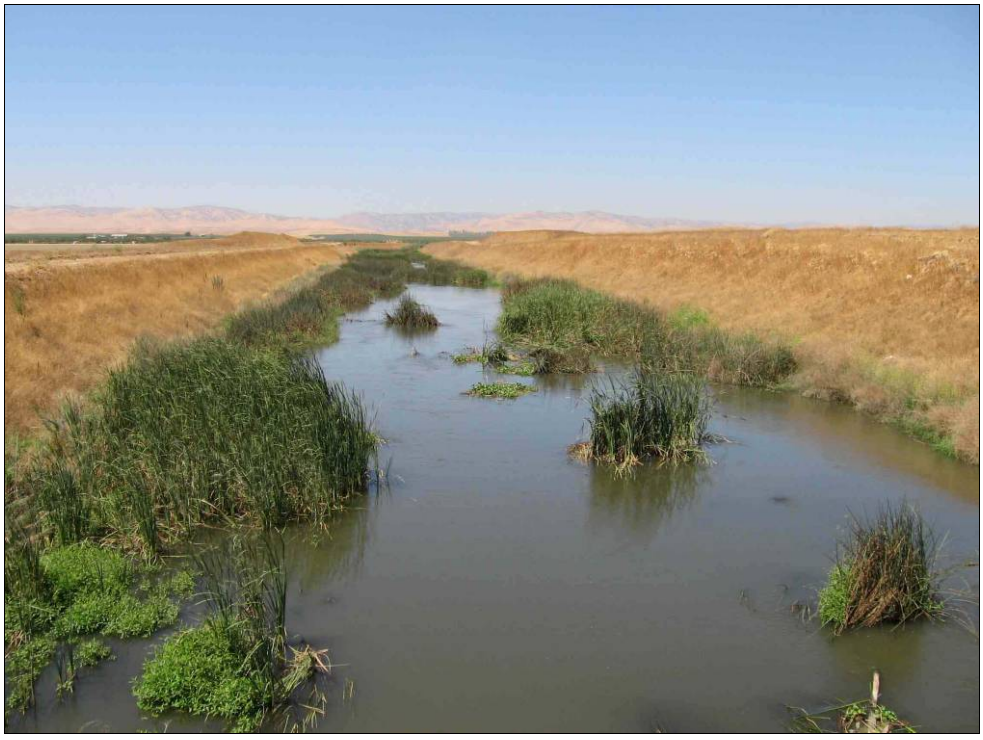

Photo I-20. 7B Wasteway looking Upstream from Draper Road

Photo I-21. 7C Wasteway looking Upstream from Draper Road

Photo I-22. 8A Wasteway looking Downstream from Draper Road

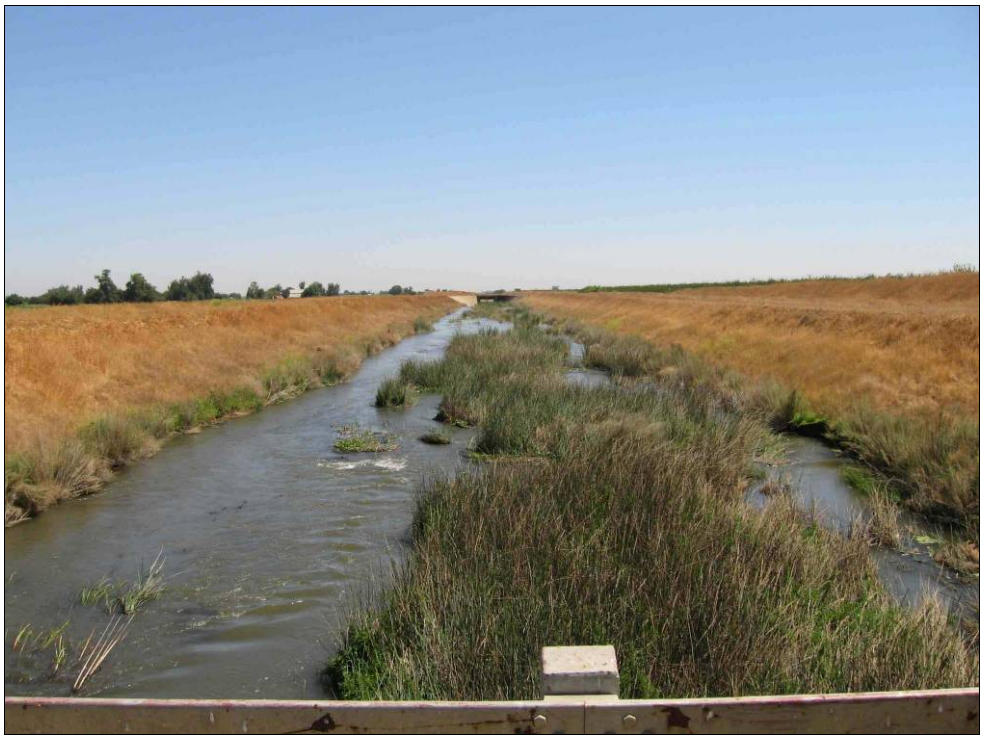

Photo I-23. 8B Wasteway looking Downstream from Draper Road

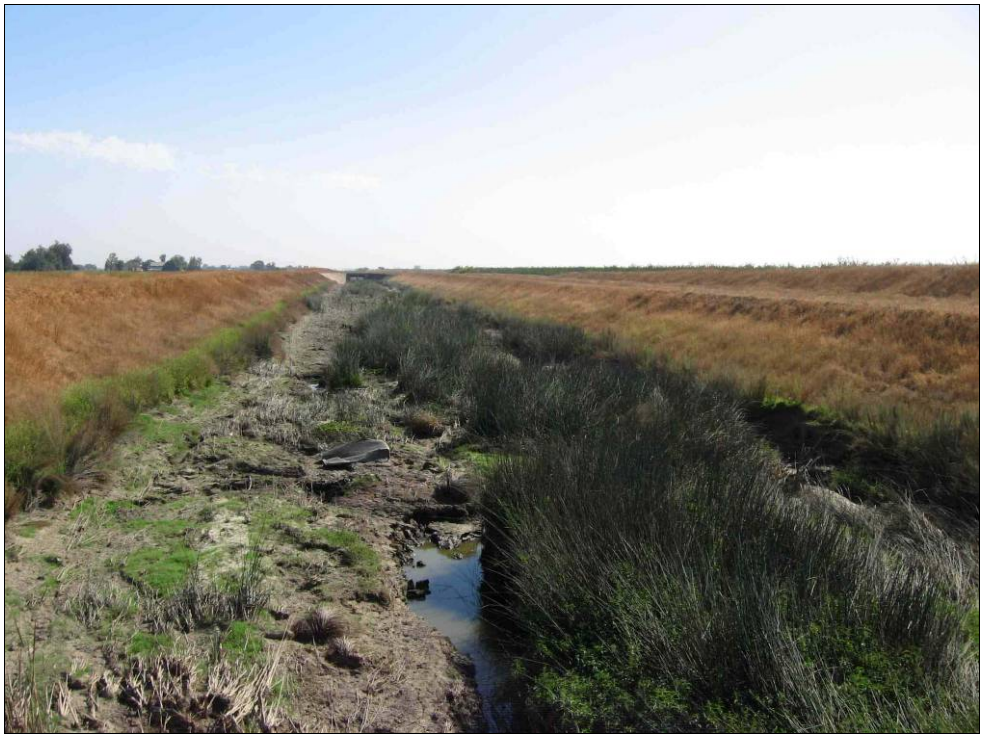

Photo I-24. 8C Wasteway looking Downstream from Draper Road

Photo I-25. 9A Wasteway Downstream of Culvert Bridge below Draper Road

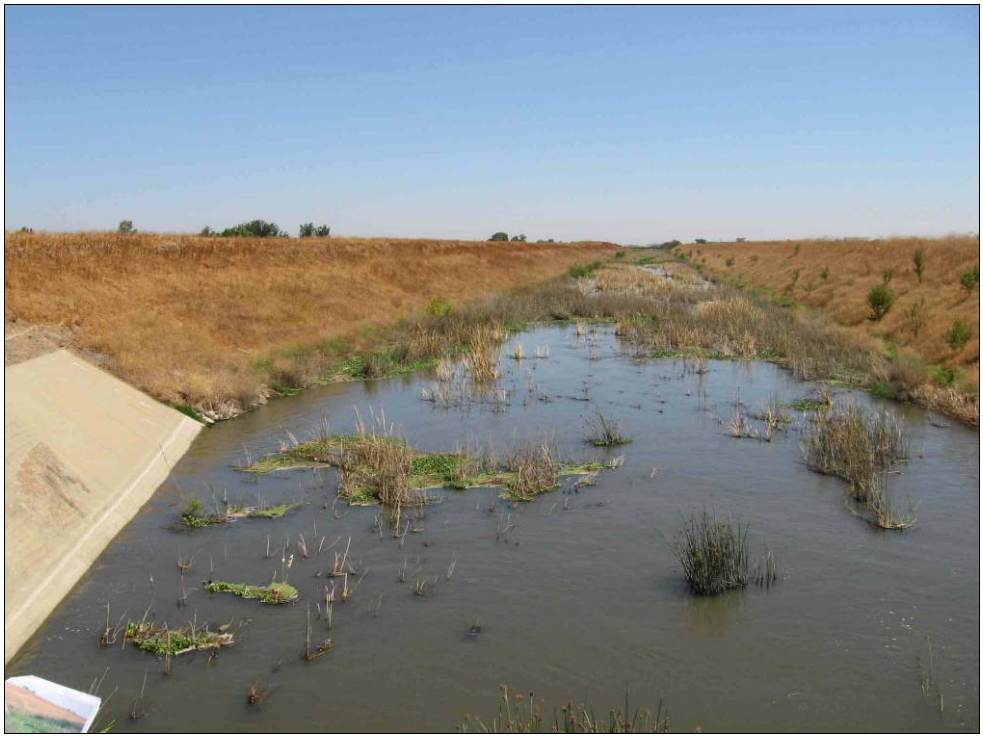

Photo I-26. 9B Wasteway Downstream of Culvert Bridge below Draper Road

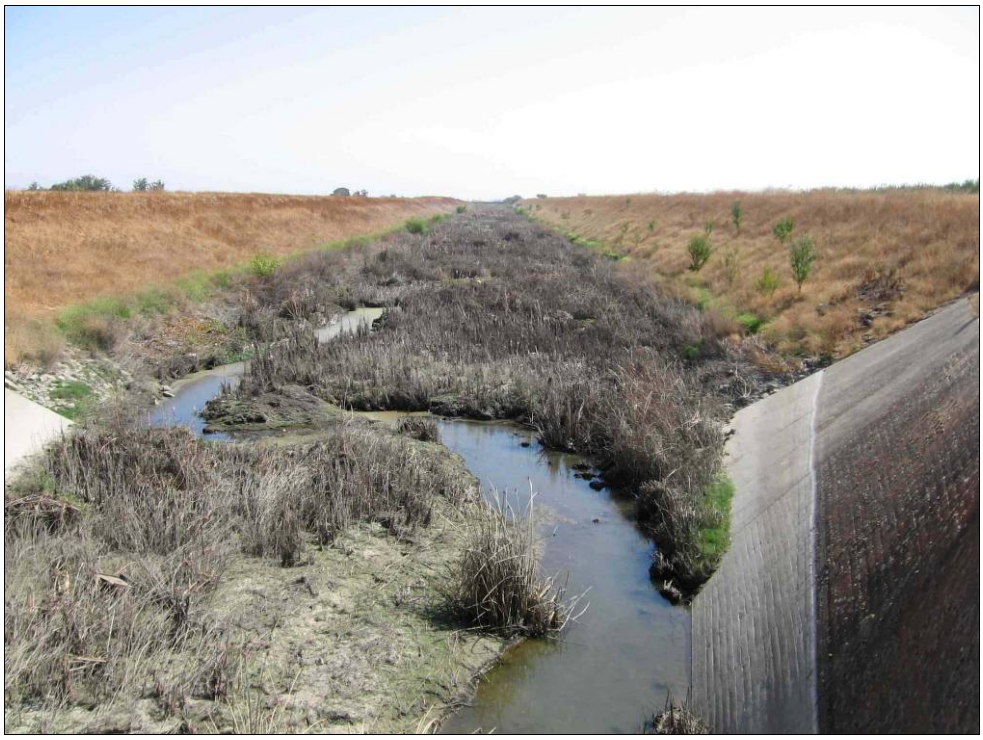

Photo I-27. 9C Wasteway Downstream of Culvert Bridge below Draper Road

Photo I-28. 10A Wasteway Upstream from Upper Road

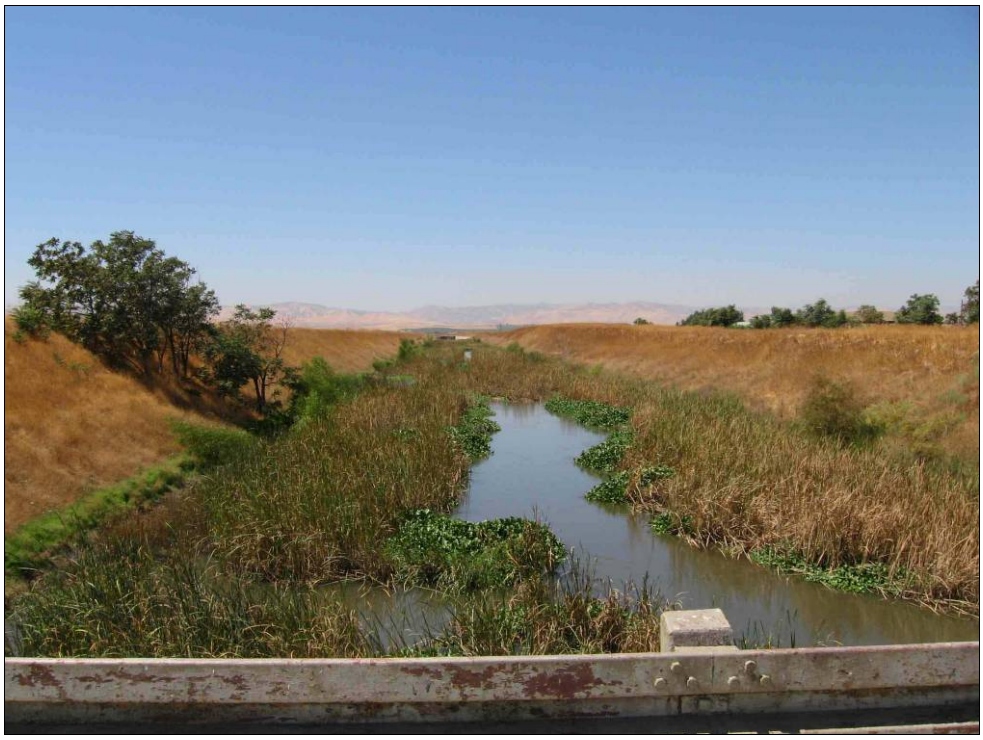

Photo I-29. 10B Wasteway Upstream from Upper Road

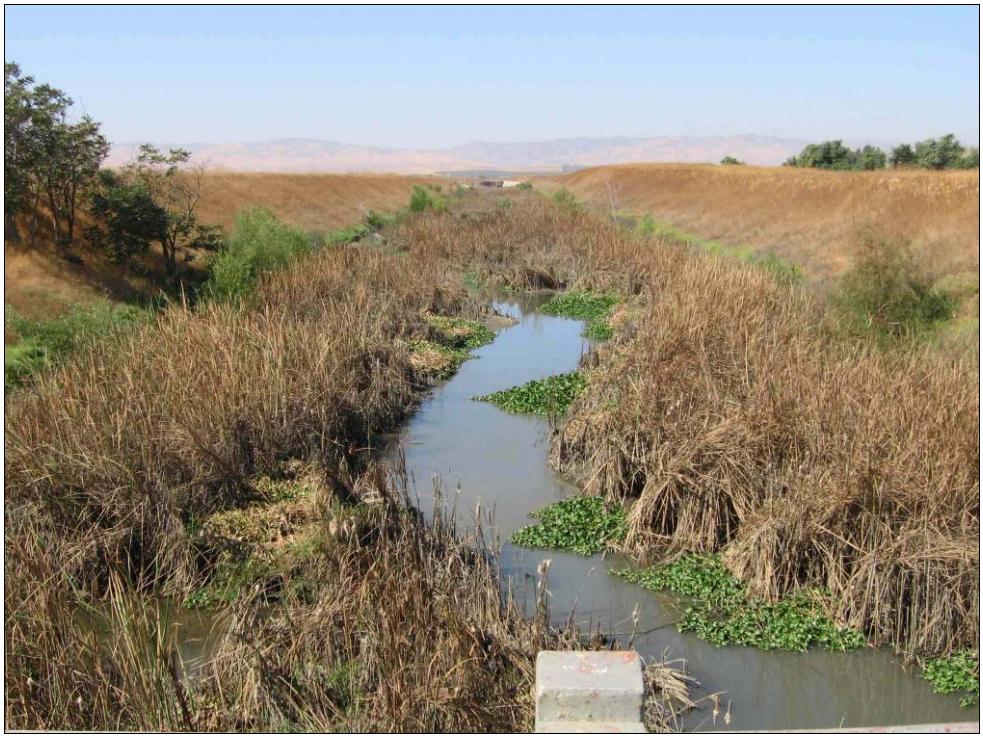

Photo I-30. 10C Wasteway Upstream from Upper Road

Photo I-31. 11A Wasteway Downstream from Upper Road

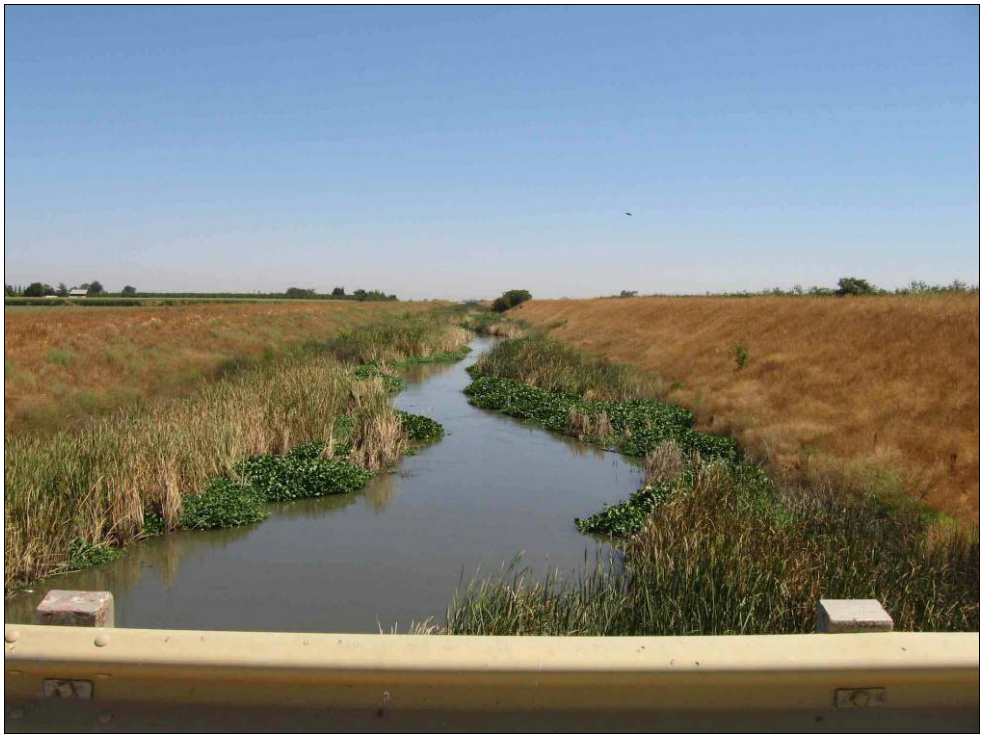

Photo I-32. 11B Wasteway Downstream from Upper Road

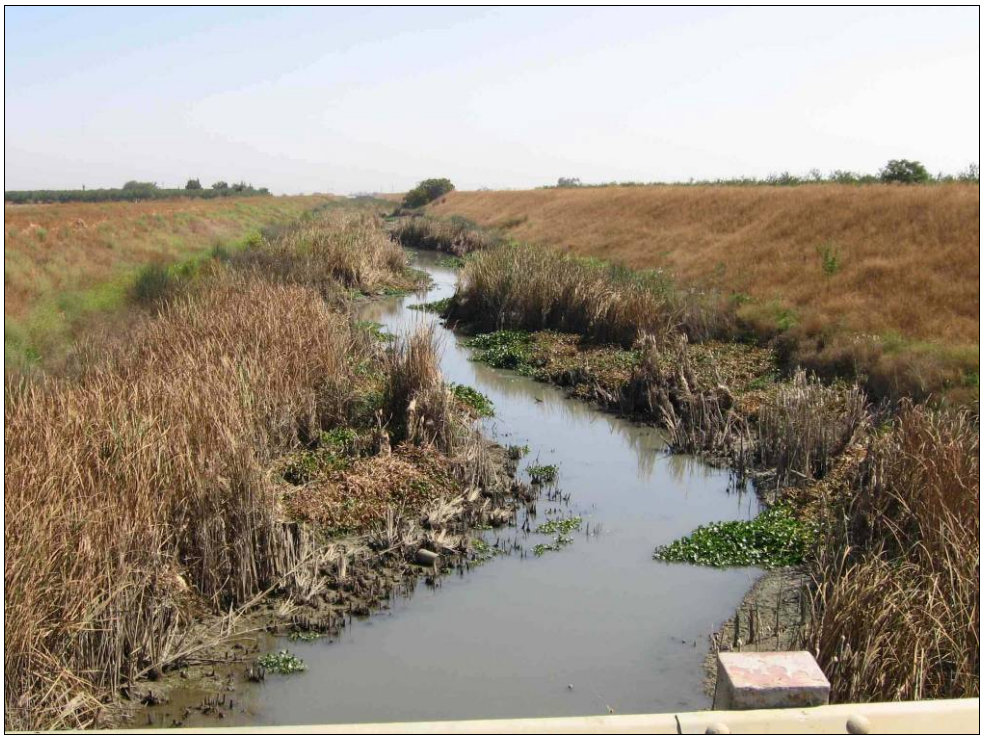

Photo I-33. 11C Wasteway Downstream from Upper Road

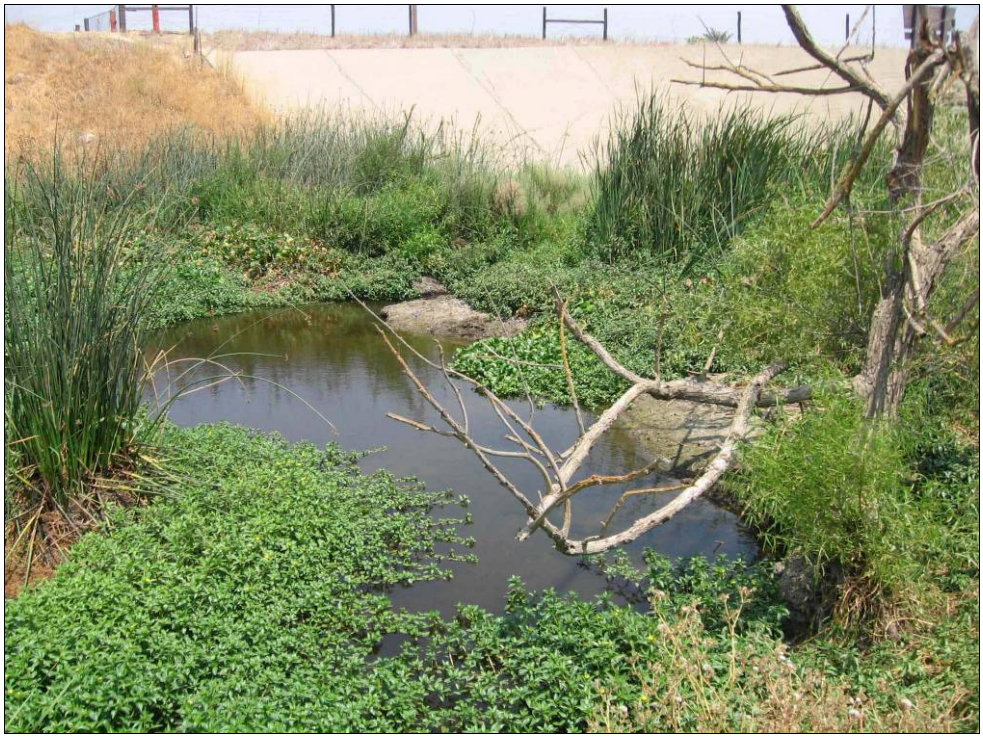

Photo I-34. 12A Wasteway Upstream from Culvert Bridge at Highway 33

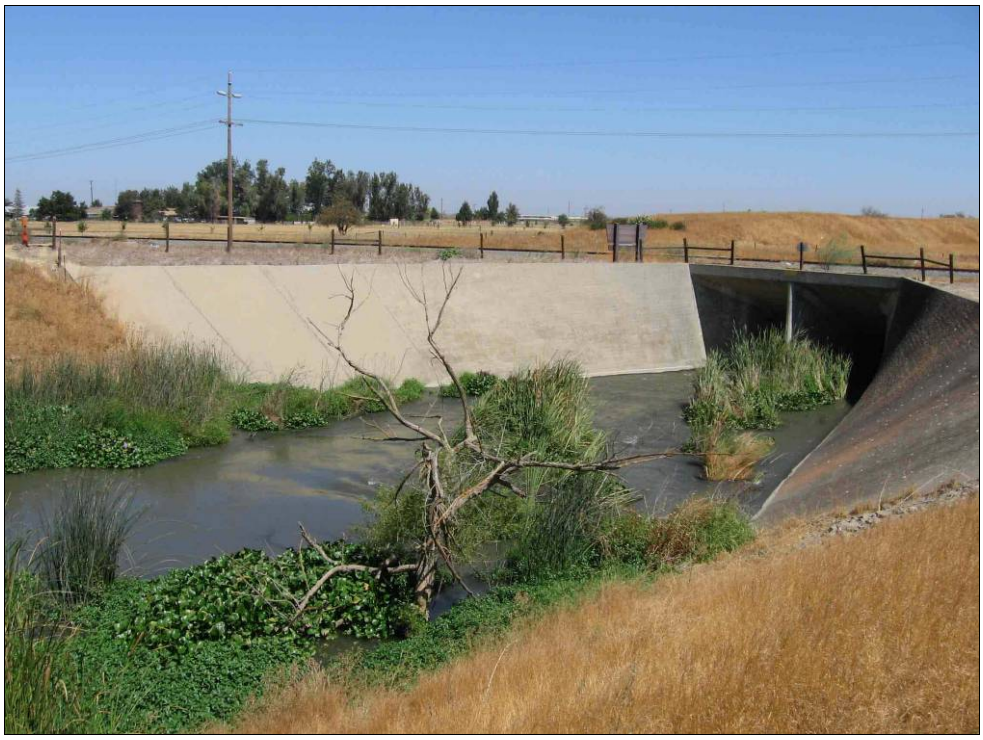

Photo I-35. 12B Wasteway Upstream from Culvert Bridge at Highway 33

Photo I-36. 12C Wasteway Upstream from Culvert Bridge at Highway 33

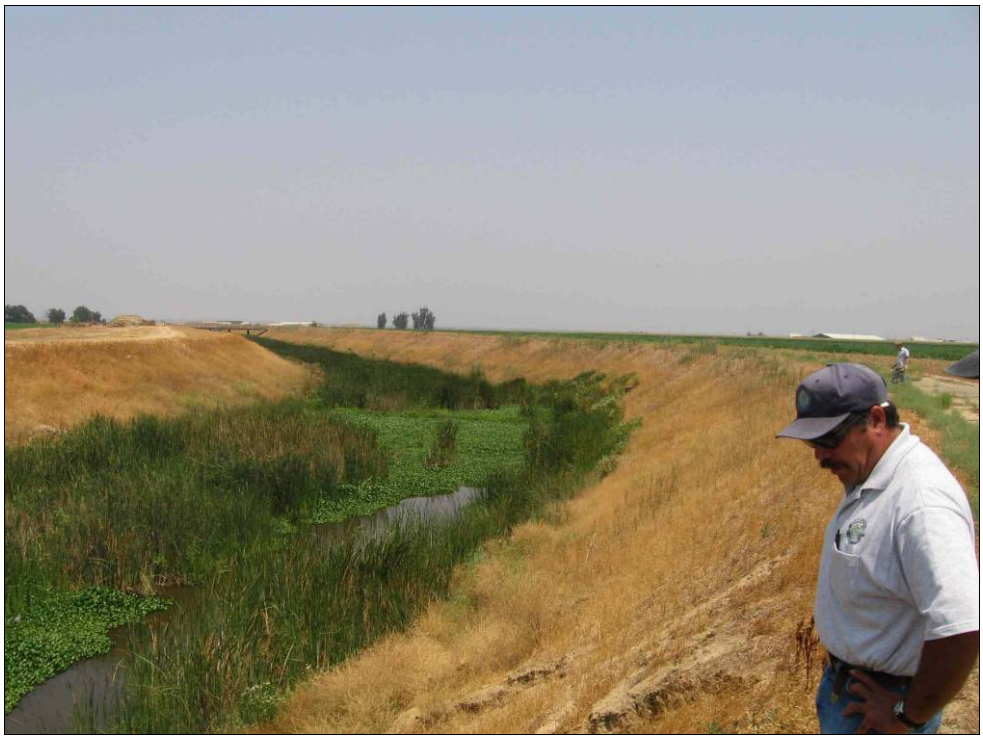

Photo I-37. 13A Wasteway Bend

Photo I-38. 13B Wastewater Bend

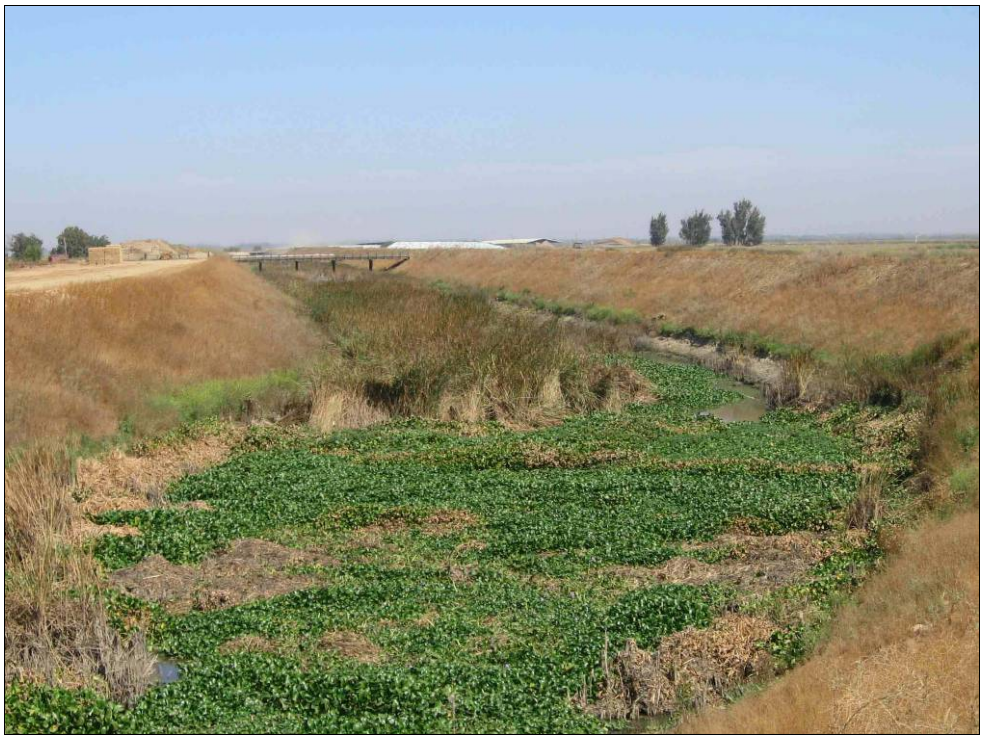

Photo I-39. 13C Wasteway Bend

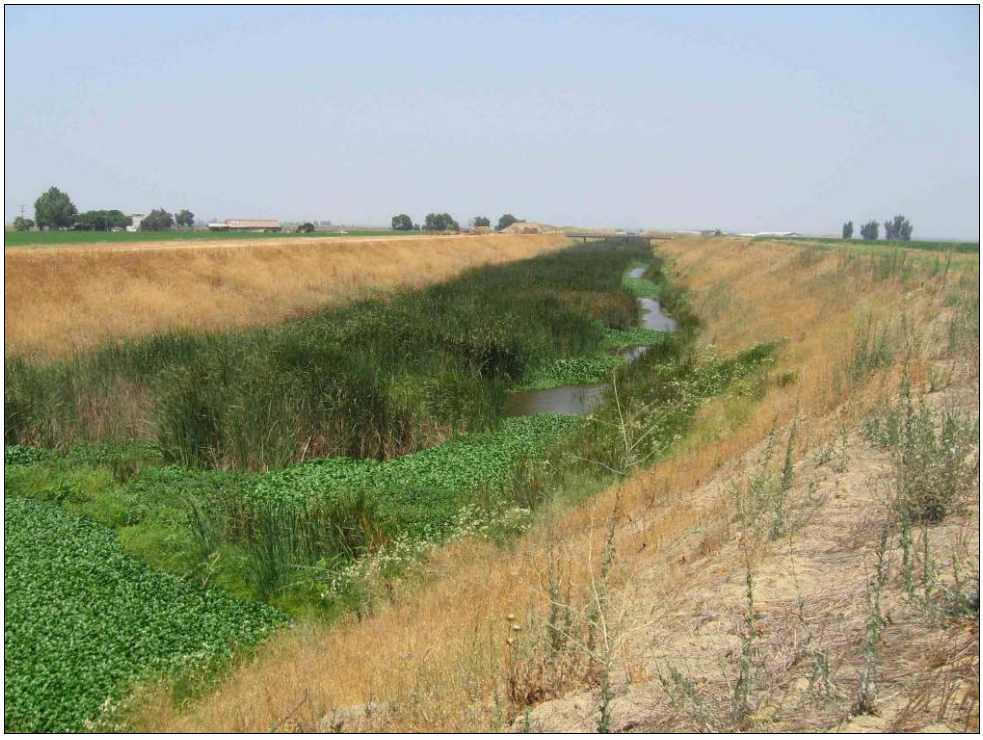

Photo I-40. 14A Wasteway Downstream of Wasteway Bend

Photo I-41. 14B Wasteway Downstream of Wasteway Bend

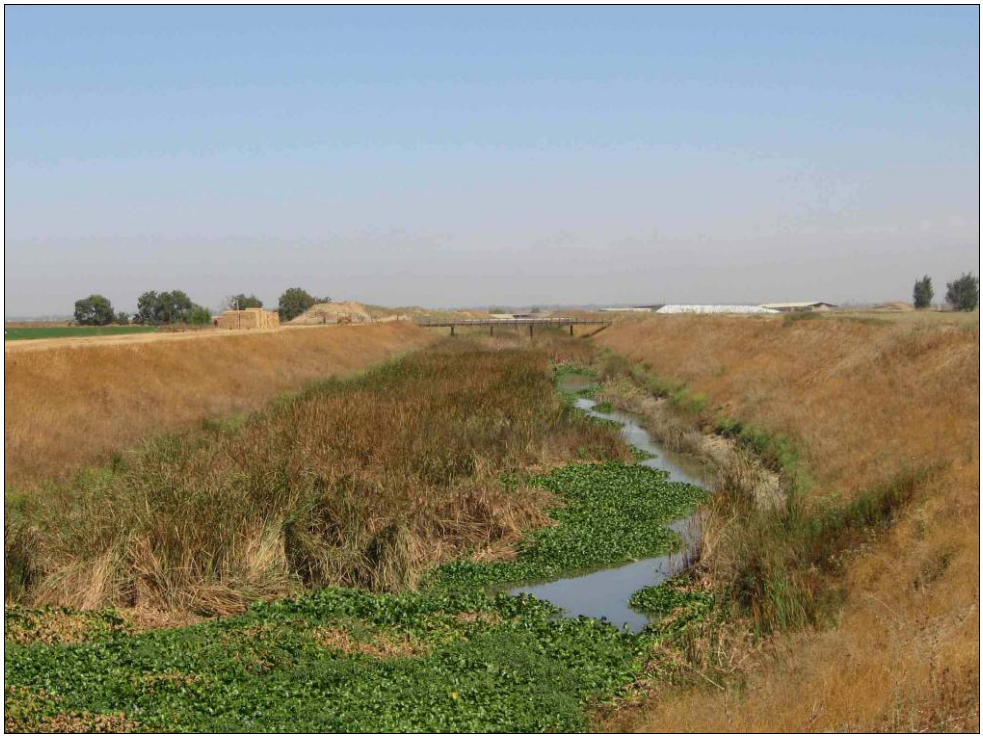

Photo I-42. 14C Wasteway Downstream of Wasteway Bend

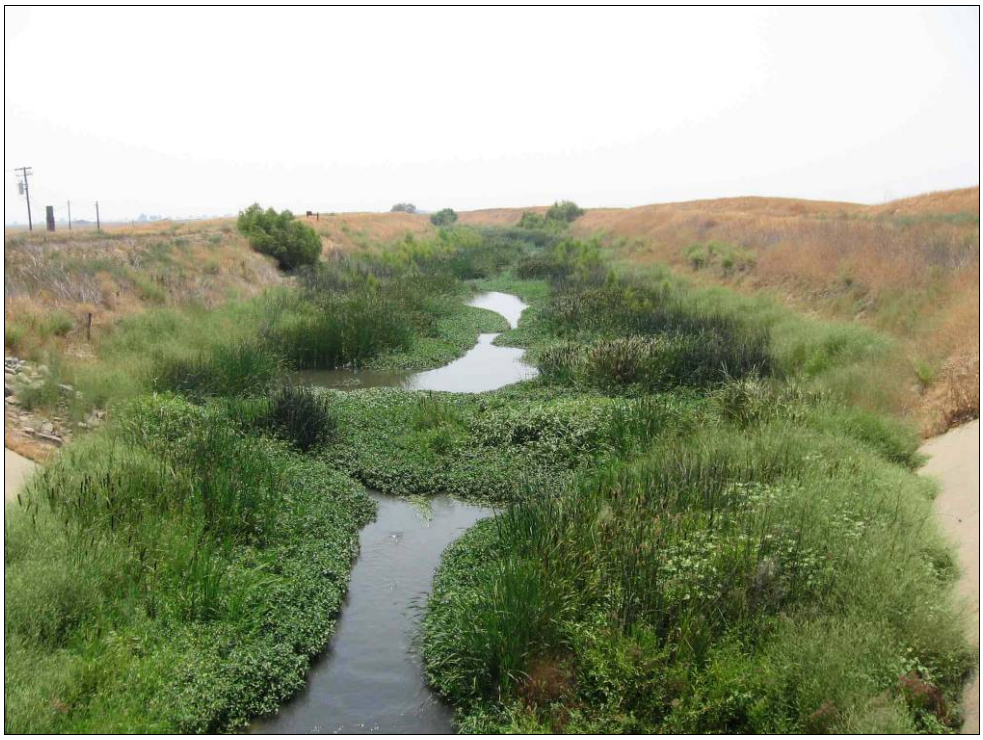

Photo I-43. 15A Wasteway Upstream of Treatment Pond Bridge

Photo I-44. 15B Wasteway Upstream of Treatment Pond Bridge

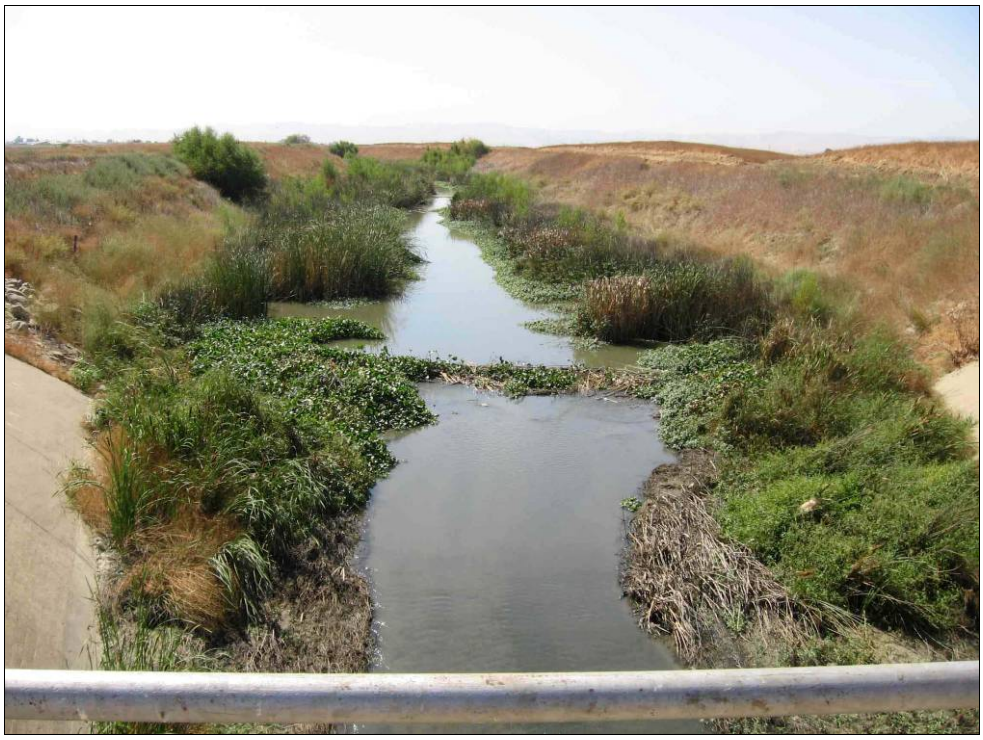

Photo I-45. 15C Wasteway Upstream of Treatment Pond Bridge

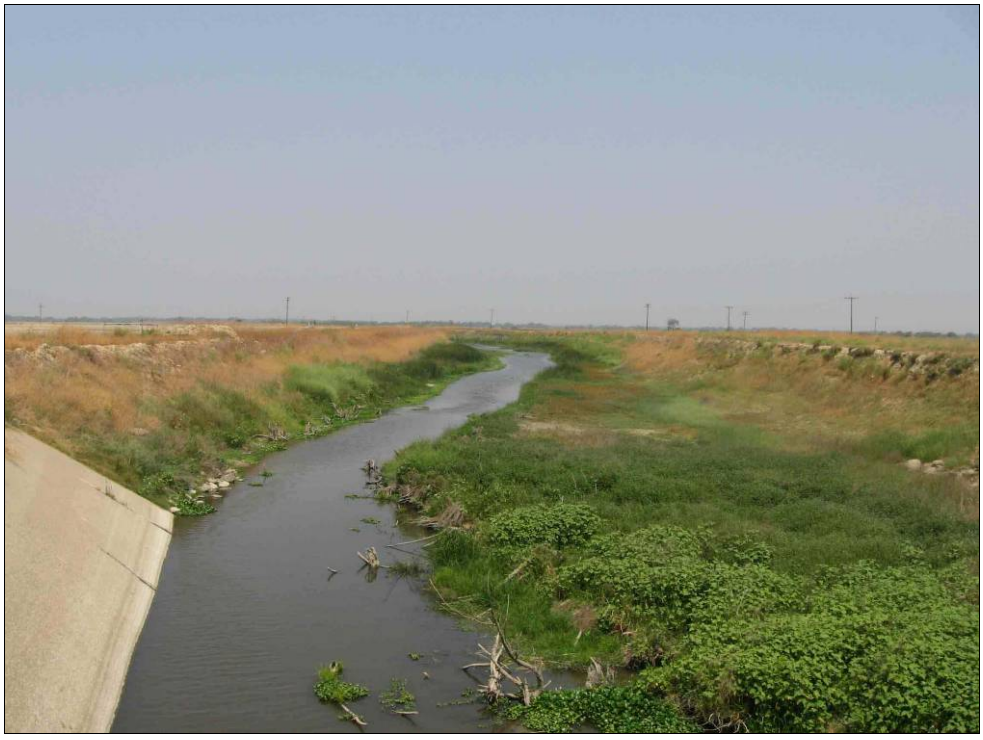

Photo I-46. 16A Wasteway Downstream of Treatment Pond Bridge

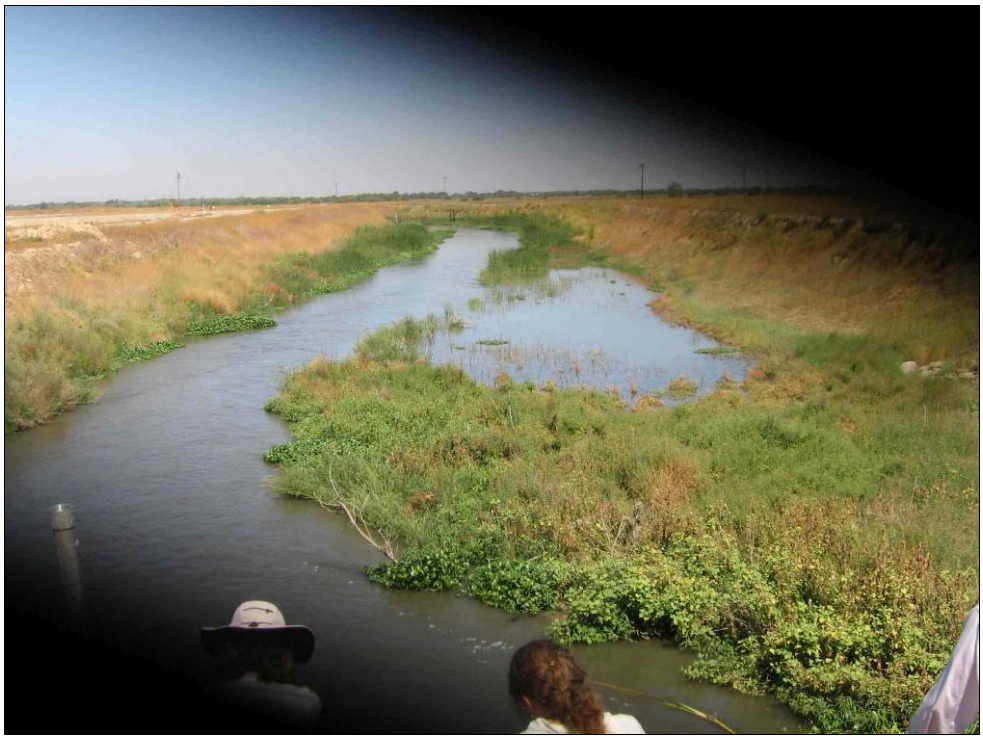

Photo I-47. 16B Wasteway Downstream of Treatment Pond Bridge

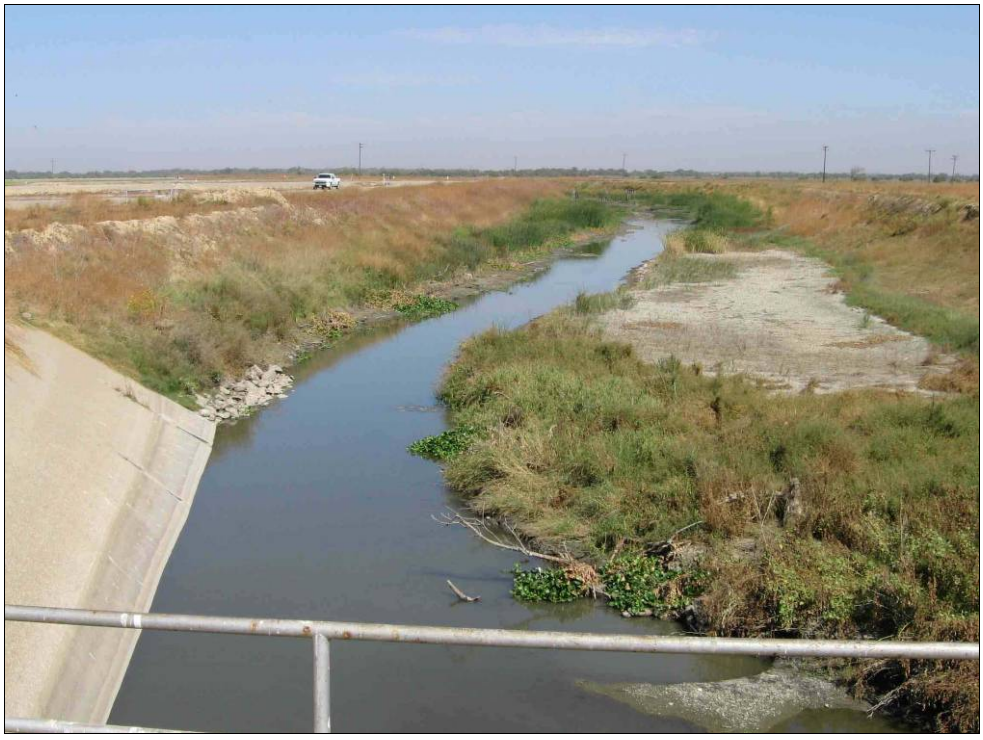

Photo I-48. 16C Wasteway Downstream of Treatment Pond Bridge

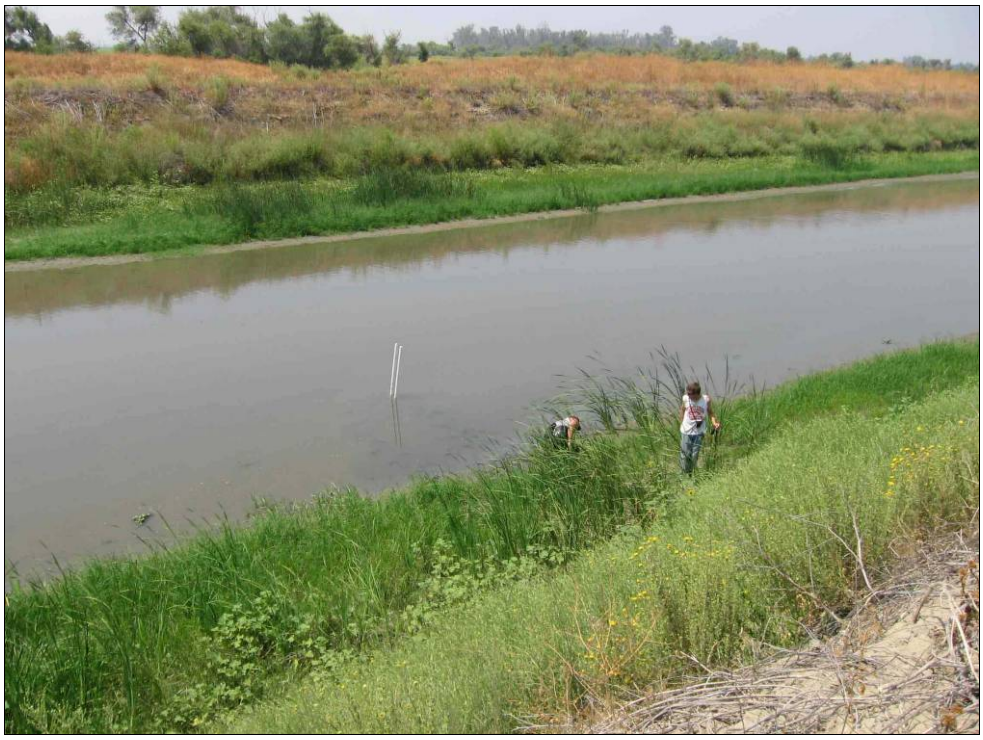

Photo I-49. 17A Wasteway 300 yds Upstream of San Joaquin River Confluence

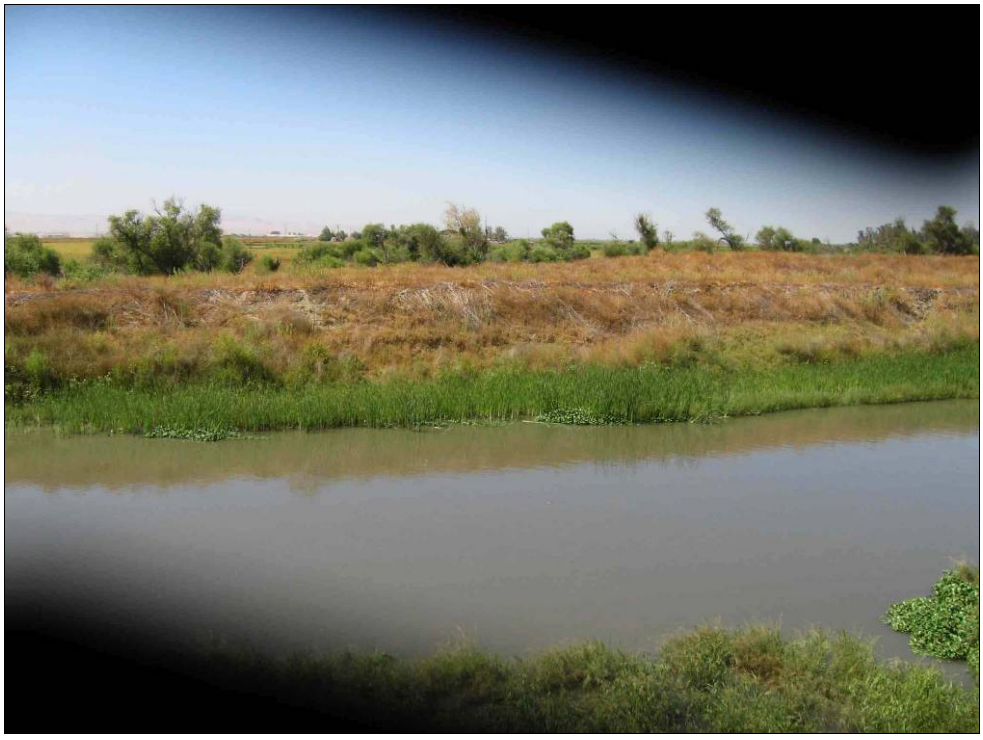

Photo I-50. 17B Wasteway 300 yds Upstream of San Joaquin River Confluence

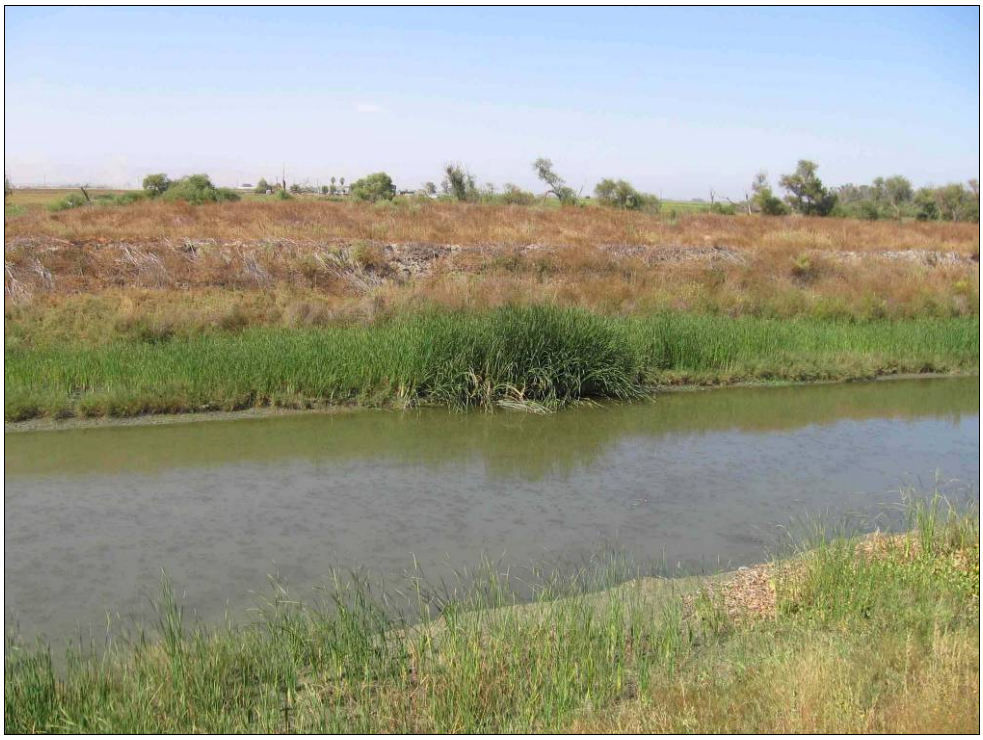

Photo I-51. 17C Wasteway 300 yds Upstream of San Joaquin River Confluence

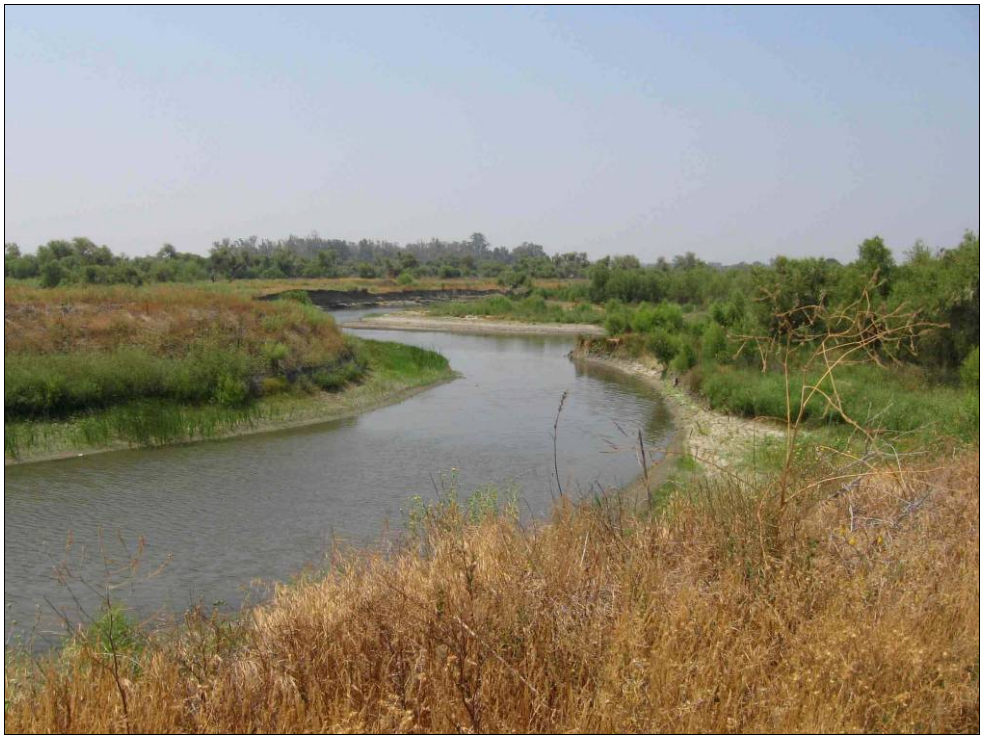

Photo I-52. 18A Wasteway Near Confluence of San Joaquin River

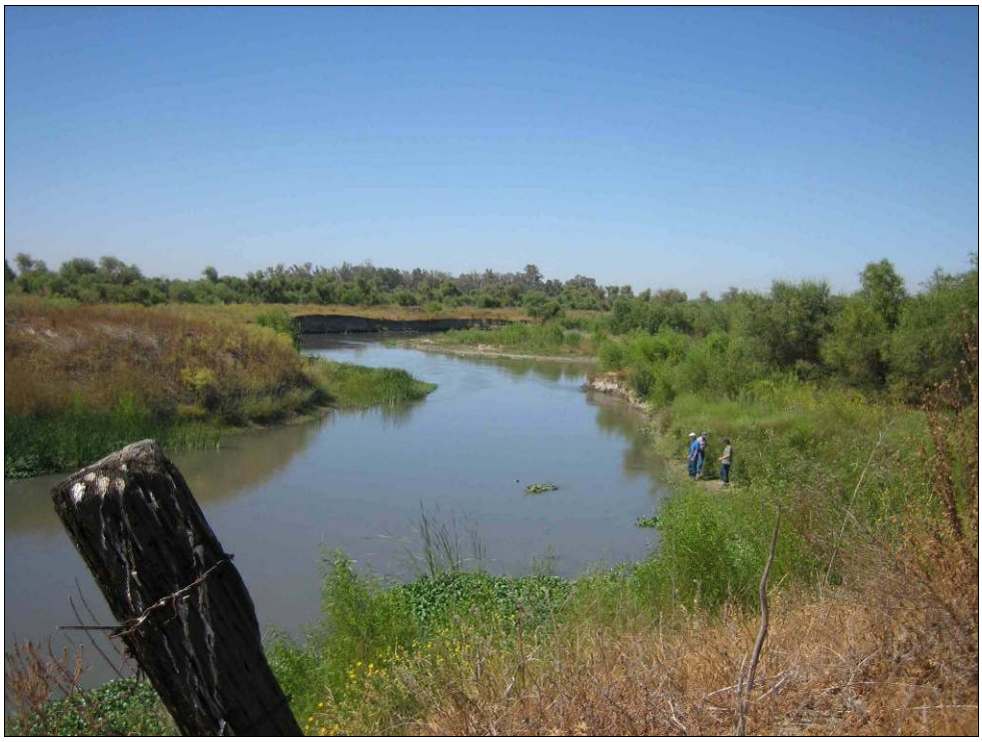

Photo I-53. 18B Wasteway Near Confluence of San Joaquin River

Photo I-54. 18C Wasteway Near Confluence of San Joaquin River

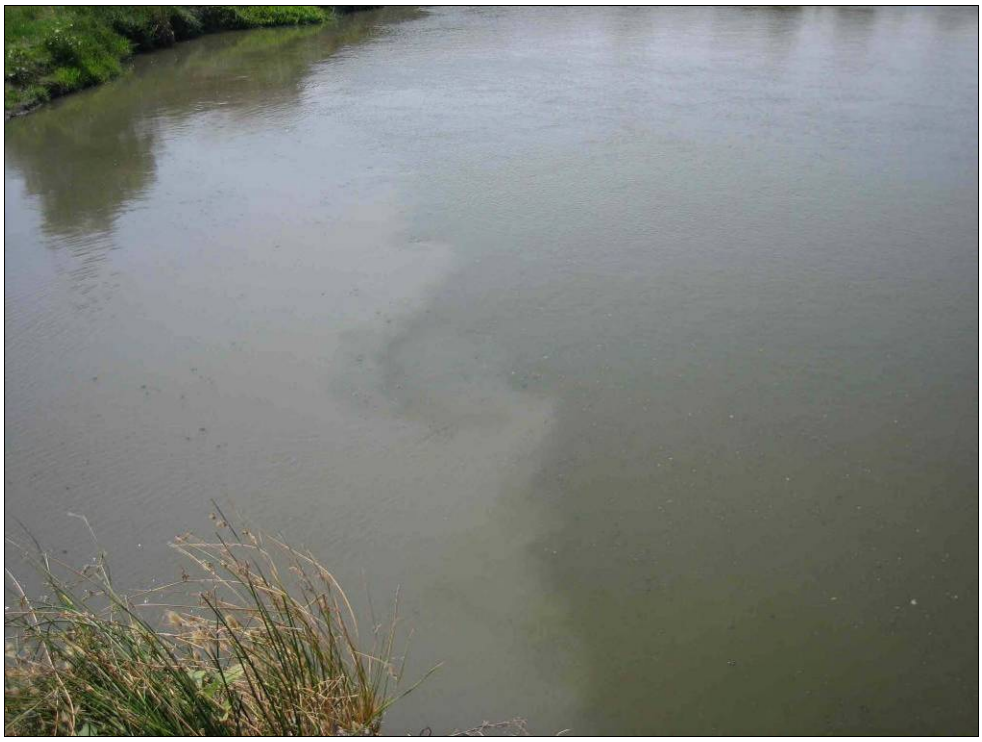

Photo I-55. 19A Sediment Plume at Confluence of Wasteway and San Joaquin River

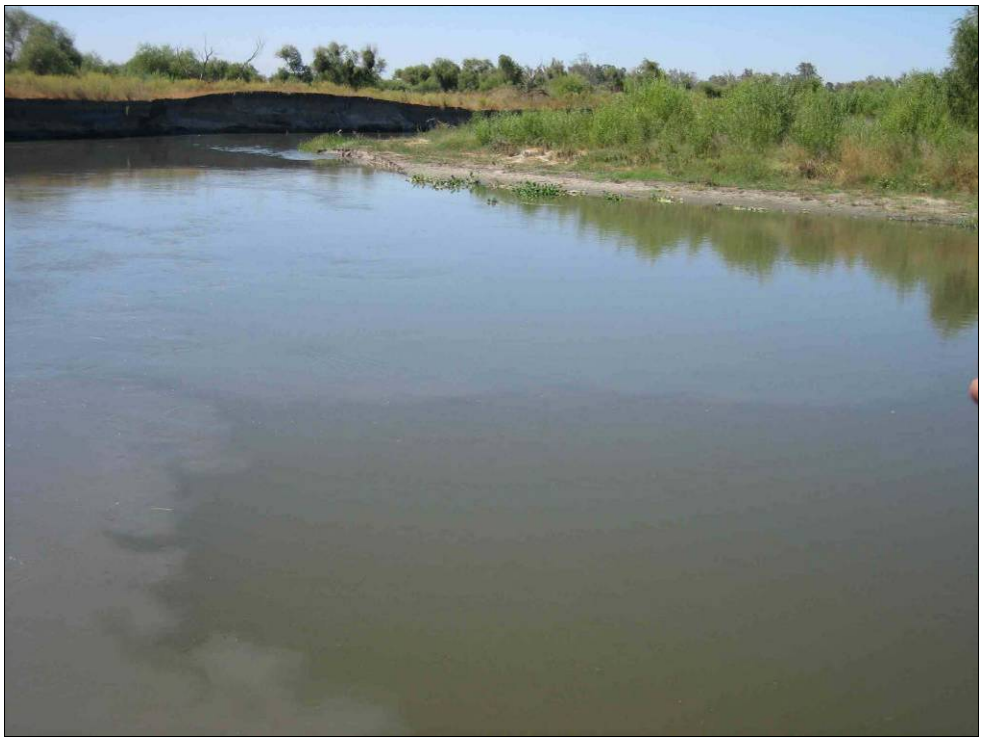

Photo I-56. 19B Sediment Plume at Confluence of Wasteway and San Joaquin River

Photo I-57. 19C Sediment Plume at Confluence of Wasteway and San Joaquin River

Photo I-58. 20C Air Bubbles at Confluence of Wasteway and San Joaquin River

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