APPENDIX F
DRAFT SECTION 404(b)(1) WATER QUALITY EVALUATION
AMERICAN RIVER COMMON FEATURES
GENERAL REEVALUATION REPORT
SACRAMENTO, CALIFORNIA

This document constitutes the Statement of Findings, and review and compliance determination according to the Section 404(b)(1) guidelines for the proposed project described in the American River Common Features Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) issued by the Sacramento District. This analysis has been prepared in accordance with 40 CFR Part 230-Section 404(b)(1) guidelines and USACE Planning Guidance Notebook, ER 1 105-2-100.

I. Project Description

a. Proposed Project

The American River Common Features General Reevaluation Report ARCF GRR project is a cooperative effort by the U.S. Army Corps of Engineers (Corps), the Central Valley Flood Protection Board, its non-federal sponsor, and the Sacramento Area Flood Control Agency, the local sponsor. The Corps has completed the ARCF GRR Draft Environmental Impact Assessment/Environmental Impact Report (EIS/EIR), dated February 2015. The Draft EIS/EIR will be referenced throughout the document to describe the existing conditions in the study area, as well as some potential impacts of the proposed project and the other alternatives.

The ARCF EIS/EIR identifies a number of problems associated with the flood risk management system protecting the city of Sacramento and surrounding areas. There is a high probability that flows in the American and Sacramento Rivers will stress the network of levees protecting Sacramento to the point that levees could fail. The consequences of such a levee failure would be catastrophic, since the area inundated by flood waters is highly urbanized and the flooding could be up to 20 feet deep.

Alternative 1 – Improve Levees

Alternative 1 involves the construction of fix-in-place levee remediation measures to address seepage, slope stability, erosion, and overtopping concerns identified for the American and Sacramento River, NEMDC, Arcade, Dry/Robla, and Magpie Creek levees. Table 1 summarizes the measures proposed under Alternative 1.

Table 1. Alternative 1 – Proposed Levee Improvement Measures by Waterway.

Waterway	Seepage Measures	Stability Measures	Erosion Protection Measures	Overtopping Measures
American River[1]	---	---	Bank Protection, Launchable Rock Trench	---
Sacramento River	Cutoff Wall	Cutoff Wall, Geotextile, Slope Flattening	Bank Protection, Launchable Rock Trench	Levee Raise
NEMDC	Cutoff Wall	Cutoff Wall	---	Floodwall/Levee Raise
Arcade Creek	Cutoff Wall	Cutoff Wall, Geotextiles	---	Floodwall/Levee Raise
Dry/Robla Creeks	---	---	---	Floodwall
Magpie Creek[2]	---	---	---	Floodwall/New Levee/Detention Basin

Notes: [1]American River seepage, stability, and overtopping measures were addressed in the ARCF WRDA 1996 and 1999 construction projects. [2]In addition to the listed measures, some improvements would need to occur on Raley Boulevard, including widening of the Magpie Creek bridge, raising the elevation of the roadway, and removing the Don Julio Creek culvert.

Figure 1 shows the reaches where seepage, slope stability, erosion, and overtopping measures would be required.

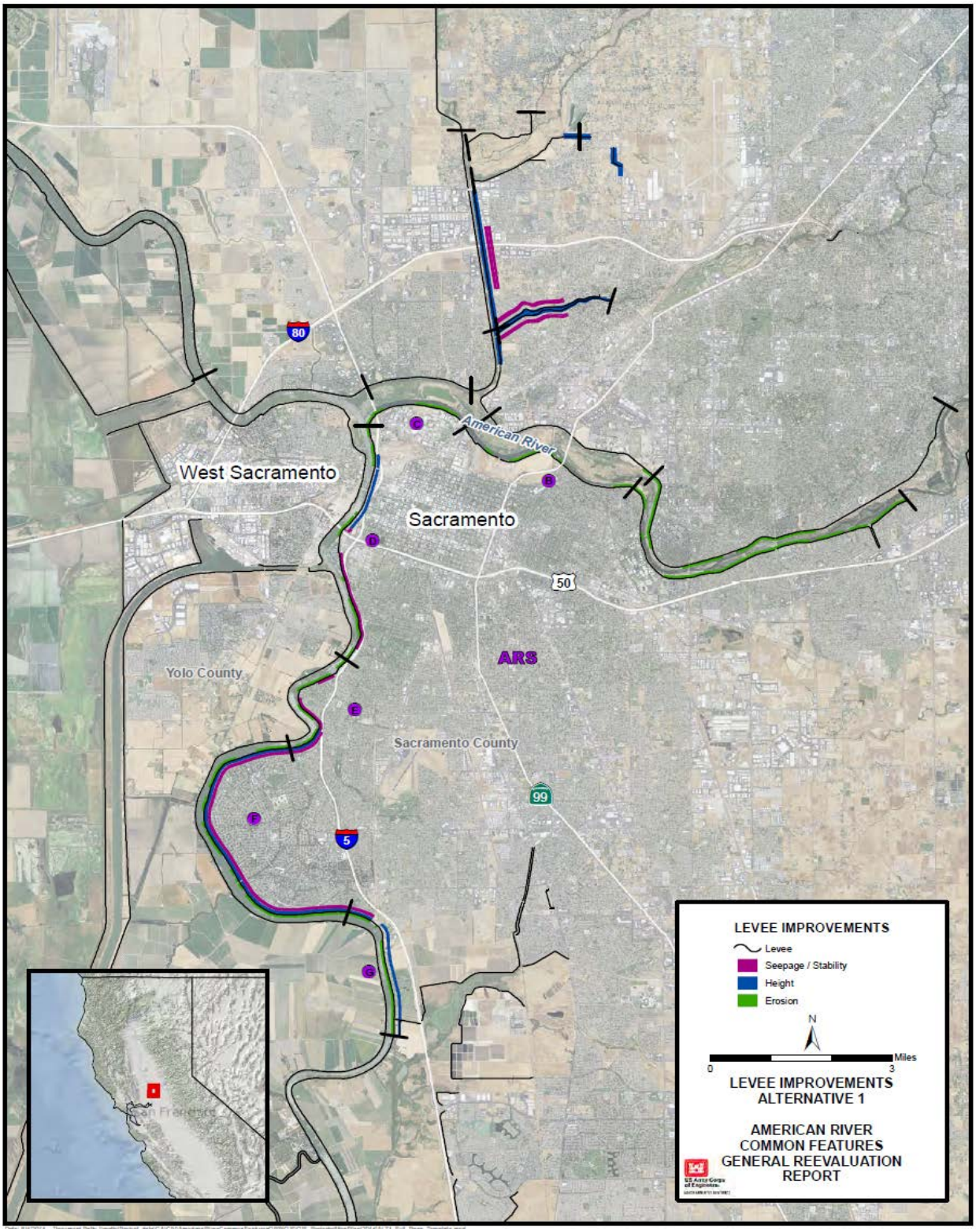

Figure 1. Alternative 1 Proposed Measures.

The proposed project would require discharge of fill material into waters of the U.S. under Section 404 of the Clean Water Act. The following subsections describe the measures proposed for Alternative 1 and identify any possible discharge of fill material associated with each measure.

Seepage and Slope Stability Measures

To address seepage concerns, a cutoff wall will be constructed through the levee crown. The cutoff wall would be installed by one of two methods: (1) conventional open trench cutoff walls, or (2) deep soil mixing (DSM) cutoff walls. The method of cutoff wall selected for each reach would depend on the depth of the cutoff wall needed to address the seepage. The open trench method can be used to install a cutoff wall to a depth of approximately 80 feet. For cutoff walls of greater depth, the DSM method would be utilized. Prior to construction of either method of cutoff wall, the construction site and any staging areas would be cleared, grubbed, and stripped. The levee crown would be degraded up to half the levee height to create a large enough working platform (approximately 30 feet) and to reduce the risk of hydraulically fracturing the levee embankment from the insertion of slurry fluids.

This measure is proposed along the American and Sacramento River, and the East Side Tributaries. Because seepage and slope stability measures would be installed directly into the levee as a cutoff wall, no fill material would be placed into waters of the U.S. by implementing this measure.

Erosion Protection

Erosion protection along the American and Sacramento Rivers would be addressed via either the launchable rock trench method or by standard bank protection. There are no erosion protection measures proposed for the East Side Tributaries. The bank protection measure would involve the placement of fill into waters of the U.S. Construction methods for the bank protection and launchable rock trench measures are described in Section h below.

Overtopping Measures

Levee raises are proposed for the Sacramento River and the East Side Tributaries to address the potential for floodwaters overtopping the levees. For the Sacramento River, Arcade Creek, NEMDC, and Dry/Robla Creeks, there would be no placement of fill into waters of the U.S., because levee raises would be conducted primarily on the crown and landside of the levees and would be designed to avoid placement of fill in the waterways. At Magpie Creek, there is the potential for approximately 1 acre of vernal pool habitat on the landside of the levee to be permanently impacted by construction of a levee raise. Construction methods for the levee raise are described in Section h below.

Alternative 2 – Improve Levees and Widen the Sacramento Weir and Bypass

Alternative 2 includes all of the measures proposed under Alternative 1, with the exception of the approximately 7 miles of levee raises on the Sacramento River. Instead, under Alternative 2, the Sacramento Weir and Bypass would be widened to lower the water surface elevations on the Sacramento River to a level that would only require approximately 1 mile of levee raises instead and divert more flows into the Yolo Bypass. Table 2 shows the measures that would be implemented under Alternative 2. Figure 3 shows the project area and extent of proposed measures under Alternative 2.

Table 2. Alternative 2 - Proposed Levee Improvement Measures by Waterway.

Waterway	Seepage Measures	Stability Measures	Erosion Protection Measures	Overtopping Measures
American River[1]	---	---	Bank Protection, Launchable Rock Trench	---
Sacramento River	Cutoff Wall	Cutoff Wall, Geotextile, and Slope Flattening	Bank Protection, Launchable Rock Trench	Sacramento Bypass and Weir Widening
NEMDC	Cutoff Wall	Cutoff Wall	---	Floodwall/Levee Raise
Arcade Creek	Cutoff Wall	Cutoff Wall, Geotextile	---	Floodwall/Levee Raise
Dry/Robla Creeks	---	---	---	Floodwall
Magpie Creek[2]	---	---	---	Floodwall/New Levee/Detention Basin

Note: [1] American River seepage, stability, and overtopping measures were addressed in the American River Common Features, WRDA 1996 and 1999 construction projects.

[2] In addition to the listed measures, some improvements would need to occur on Raley Boulevard, including widening of the Magpie Creek bridge, raising the elevation of the roadway, and removing the Don Julio Creek culvert.

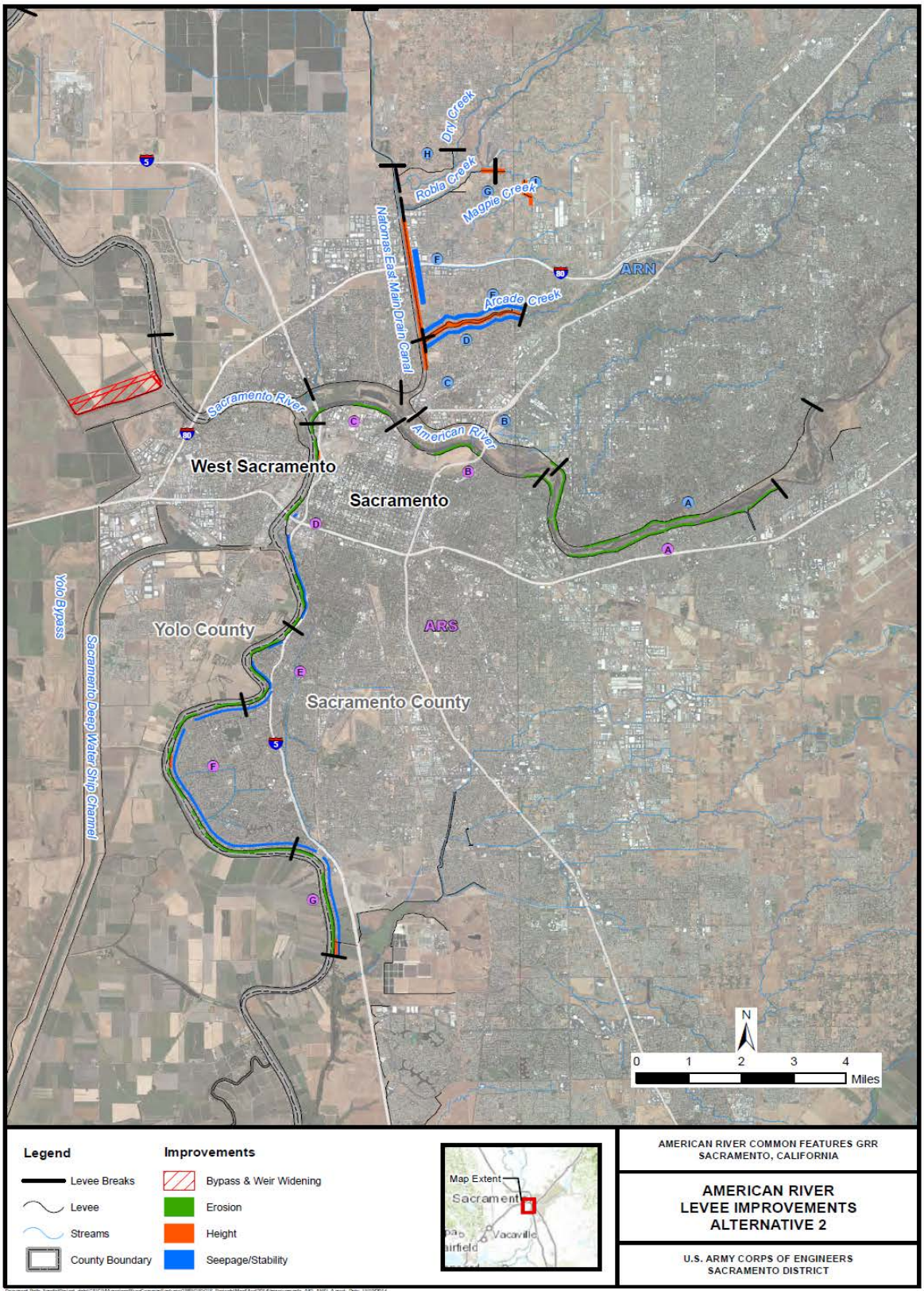

Figure 3. Alternative 2 Proposed Measures.

Sacramento Weir and Bypass Widening

The Sacramento Bypass and Weir currently allow excess flood waters to spill out of the system into the Yolo Bypass thereby reducing the loading on the levee system below. Alternative 2 leverages this existing structure by extending the current weir structure 1,500 feet north along with relocating the bypass levee. The weir, combined with the increased bypass width and operations change, will allow more water to be released out of the system eliminating the need for most of the height improvements along the ARS sub-basin, Reaches D to G. However, this alternative does not reduce the need for seepage, stability and erosion improvements within those reaches. Relocation of the Sacramento Bypass levee would result in the placement of fill in waters of the U.S. Construction methods for this measure are described in Section h below.

b. Location

The proposed project is located in and around the city of Sacramento, California. The ARCF GRR study area includes: (1) approximately 12 miles of the north and south banks of the American River immediately upstream from the confluence with the Sacramento River; (2) the east bank of the NEMDC, Dry, Robla, and Acrade Creeks and the Magpie Creek Diversion Channel (collectively referred to as the East Side Tributaries); (3) the east bank of the Sacramento River downstream from the American River to Freeport, where the levee ties into Beach Lake Levee, the southern defense for Sacramento; and (4) the Sacramento Weir and Bypass, located along the north edge of the city of West Sacramento. Figure 1 shows the proposed study area for Alternative 1 and Figure 2 shows the Alternative 2 study area, which includes the additional measures to the Sacramento Weir Bypass.

c. Purpose and Need

The purpose of this project is to reduce the flood risk and damage in the greater Sacramento area. The Sacramento Metropolitan area is one of the most at risk areas for flooding in the United States. There is a high probability that flows in either the American or Sacramento Rivers will stress the network of levees protecting the study area to the point that levees could fail. The consequences of such a levee failure would be catastrophic since the inundated area is highly urbanized and the flooding could be up to 20 feet deep. Providing flood damage reduction would reduce loss of life and damage to property in the project area.

The Sacramento metropolitan area has a high probability of flooding due to its location at the confluence and within the floodplain of two major rivers. Both of these rivers have large watersheds with very high potential runoff which has overwhelmed the existing flood management system in the past. The existing levee system was designed and built many years ago, before modern construction methods were employed. These levees were constructed close to the river to increase velocities associated with flood flows are eroding the levees, which are critical components of the flood management system needed to reduce the flood risk in the study area.

In addition to the high probability of flooding, the consequences of flooding in the study area would be catastrophic. The flooding would rapidly inundate a highly urbanized area with minimal warning or evacuation time. As the Capital of California, the Sacramento metropolitan area is the center of State government and many essential statewide services are located here. The study area is also at the crossroads of four major highway/interstate systems that would be impassable should a flood occur. The effects of flooding within the study area would be felt not only at the local level, but at the regional, State, and National level as well.

Because of the deposits of hydraulic mining debris that washed into the American and Sacramento River valleys, early levee builders constructed the flood management features by dredging material from the river beds and placing it on the bank near the river. This served several purposes. First, the resulting levee provided a degree of protection from flooding. Second, it removed material from the river bed, allowing it to convey more water. And finally, by placing the levees close to the river's edge, the river flow was confined, speeding its flow, and causing it to erode away the material that had been deposited by hydraulic mining, further increasing the river's capacity.

The levees continue to confine the flow into a relatively narrow channel, still eroding and degrading the river channel. However, by now, most of the sediment deposited in the river channels has been removed. Both the Sacramento River and the American River are confined by levees and have very little sediment in the water. Additionally, on the American River, Folsom Dam blocks sedimentation from upstream sources. Therefore, the energy of the flow tends to erode riverbanks and levees. This channel erosion and degradation could have detrimental effects on the levees by undercutting the foundation materials beneath the levees, particularly if the riverbank consists of easily erodible materials. The erosion of the riverbank adjacent to levee embankments may increase the underseepage through the foundation soils. It can also reduce the stability of the levee slopes by undermining the levee embankment and eroding the levees themselves. Significant erosion can lead to the failure of the levee.

Empirical evidence and prototype experiments indicate that stream bank erosion in the area can be gradual or episodic. That is to say, some erosion occurs almost every year. This is primarily due to the fact that materials have been placed on the banks by landowners in an effort to halt erosion. These materials are generally random materials, placed without regard to engineering standards. The Sacramento District is currently evaluating erosion trends as part of the Water Resources Development Act (WRDA) 2007 authorization for Sacramento River Bank Protection Project (SRBPP).

d. Authority

The basic authority for the Corps to study water resource related issues in the American and Sacramento Rivers is Section 209 of the Flood Control Act of 1962, Pu. L. No.87-875, § 209, 76 Stat. 1180, 1196-98 (1962). The EIS/EIR for the project was prepared as part of the interim general reevaluation study of the ARCF Project, which was authorized by Section 130 Section 130 of the Energy and Water Development and Related Agencies Appropriations Act of 2008, Pub. L. No. 110-161, § 130,

121 Stat. 1844, 1947 (2007). Additional authority was provided in Section 366 of WRDA of 1999. WRDA 1999, Pub. L. No. 106-53, § 366, 113 Stat. 269, 319-320 (1999). Significant changes to the project cost were recommended in the Second Addendum to the Supplemental Information Report of March 2002. This report was submitted to the Assistant Secretary of the Army for Civil Works, but before it could be forwarded to Congress, authorized total cost of the project was increased to $205,000,000 by Section 129 of the Energy and Water Development Appropriations Act of 2004, Pub. L. No. 108-137, § 129, 117 Stat. 269, 1839 (2003). The current estimated cost of the authorized project is $305,340,000. The allowable cost limit is $307,071,000.

e. Alternatives [40 CFR 230.10]

Unless otherwise noted, the information is from the February 2015 American River Common Features Draft EIS/EIR.

(1) No action:

The No-Action Alternative, under NEPA, is the expected future without-project condition. Under CEQA, the No-Action Alternative is the existing condition at the time the notice of preparation was published (February 28, 2008) as modified by what would reasonably be expected to occur in the foreseeable future if the project were not approved. The No Action Alternative assumes that no work would be completed by the Corps and the study area would continue to be at a very high risk of levee failure and subsequent flooding of the Sacramento Metropolitan area. This area includes the California State Capitol and many other State and Federal Agencies. Although the No-Action Alternative would have no impacts on waters of the U.S., it does not meet the project purpose and is, therefore, not considered to be one of the least environmentally damaging practicable alternatives (LEDPA).

(2) Other project designs:

Alternative 1 – Improve Levees

Alternative 1 involves the construction of fix-in-place levee remediation measures to address seepage, slope stability, erosion, and overtopping concerns identified for the American and Sacramento River, NEMDC, Arcade, Dry/Robla, and Magpie Creek levees. A complete summary of the measures proposed under Alternative 1 can be found above in Table 1. The project area for Alternative 1 is shown above in Figure 1. This action is considered a practicable alternative and will be retained and evaluated in determining the LEDPA.

Alternative 2 – Improve Levees and Widen the Sacramento Weir and Bypass

Alternative 2 would include all of the levee improvements described for Alternative 1, except that instead of approximately 7 miles of levee raises along the Sacramento River there would be approximately 1 mile of levee raises. Instead of the full extent of levee raises, the Sacramento Weir and

Bypass would be widened to divert more flows into the Yolo Bypass, as described above. A complete summary of the proposed measures can be found in Table 2 above. The project area for Alternative 2 is shown above in Figure 3. This action is considered a practicable alternative and will be retained and evaluated in determining the LEDPA.

f. General Description of Dredged or Fill Material

(1) General Characteristics of Material

Erosion Protection

Bank protection measures would involve the discharge of fill material into waters of the U.S. Fill materials for bank protection would consist of large stone riprap ranging from 18 to 36 inch large to armor the waterside slope with a fine sand or silt fill over the top to allow for vegetation planting on the berms. The proposed sand or silt for the bank protection would come from clean, imported fill material.

Overtopping Measures

The implementation of levee raises at Magpie Creek would involve the discharge of fill material into waters of the U.S. Fill materials for levee raises would be silty and clayey soils with a minimum content of 20% fine particles, a liquid limit less than 45, and a plasticity index between 7 and 15. No organic material or debris may be present in the soil. The proposed soil would be clean and would be imported from either a tested and approved borrow site, or from an commercial source.

Sacramento Bypass Widening

Relocation of the Sacramento Bypass north levee, as part of the Sacramento Bypass widening, would involve placement of fill into waters of the U.S. Fill materials associated with this action would consist of silty and clayey soils with a minimum content of 20% fine particles, a liquid limit less than 45, and a plasticity index between 7 and 15. No organic material or debris may be present in the soil. The proposed soil would be clean and would likely consist of the current Sacramento Bypass north levee soils, as the existing levee material is proposed for reuse to the maximum extent practicable. Any borrow material necessary would be clean and would be imported either from a tested and approved borrow site, or from a commercial source.

(2) Quantity of Material

Erosion Protection

Approximately 2.75 million tons of rock would be required to construct bank protection sites on the American and Sacramento River. This would result in approximately 11 miles of bank protection fill on the American River and approximately 10 miles on the Sacramento River. Approximately 17 acres of

fill would be placed in the American River. Approximately 15 acres of fill would be placed into the Sacramento River.

Overtopping Measures

Approximately 1 acre of soil fill would be placed in waters of the U.S. to construct the levee raise at Magpie Creek.

Sacramento Weir and Bypass

There are approximately 14 acres of canals and drainage ditches in the widened Sacramento Weir and Bypass area that would be permanently impacted by this measure. However, the widened Sacramento Bypass area of approximately 325 acres would become permanent waters of the U.S., therefore the effect from this measure would be offset by the new floodplain habitat created within the widened bypass.

(3) Source of Material

Erosion Protection

Riprap for bank protection, seepage berms, and adjacent levees would be imported from a licensed, permitted facility that meets all Federal and State standards and requirements. The material would be transported along either existing roadways and construction access roads, or for Sacramento River sites could be imported via river barge hauling.

Overtopping Measures

Potential locations for borrow material, soil maps and land use maps were obtained for a 25-mile radius surrounding the project area. Borrow sites would be lands that are the least environmentally damaging and would be obtained from willing sellers. Material will be excavated from upland areas and not waterways, wetlands, or water bodies. The criteria used to determine potential locations were based on current land use patterns, soil types from Natural Resources Conservation Service (NRCS), and Corps' criteria for material specifications. The data from land use maps and NRCS has not been field verified, therefore, to ensure that sufficient borrow material would be available for construction the Corps looked at all locations within the 25 miles radius for 20 times the needed material. This would allow for sites that do not meet specifications or are not available for extraction of material.

It is estimated that a maximum of 1 million cubic yards (CY) of borrow material (soil) could be needed to construct the project. Because this project is in the preliminary stages of design, detailed studies of borrow material needs for each alternative have not been completed. For the purposes of NEPA/CEQA, the analysis evaluates the maximum foreseeable volume of borrow material that could be

needed to construct the project. Actual volumes exported from any single borrow site would be adjusted to match demands for fill. The source of the material will come from inland areas (i.e. rock quarries).

The excavation limits on the borrow sites would provide a minimum buffer of 50 feet from the edge of the borrow site boundary. From this setback, the slope from existing grade down to the bottom of the excavation would be no steeper than 3H:1V. Excavation depths from the borrow sites would be determined based on available suitable material and local groundwater conditions. The borrow sites would be stripped of top material and excavated to appropriate depths. Once material is extracted, borrow sites would be returned to their existing use whenever possible, or these lands could be used to mitigate for project impacts, if appropriate. Waters of the U.S. will not be impacted by source material being used.

Sacramento Weir and Bypass

Soil necessary for the Sacramento Weir and Bypass levee relocation would be reused from the existing levee to the maximum extent practicable. Any additional borrow soil needed would be acquired through the methods discussed above for Overtopping Measures.

g. Description of the Proposed Discharge Site

(1) Location

Erosion Protection

Erosion protection measures would be constructed along approximately 12 miles of the north and south banks of the American River immediately upstream from the confluence with the Sacramento River. In addition, they would be construction along the east bank of the Sacramento River downstream from the American River to Freeport, where the levee ties into Beach Lake Levee, the southern defense for Sacramento.

Overtopping Measures

Overtopping measures are proposed along the west bank of the Magpie Creek Diversion Canal from just downstream from Raley Boulevard to about 100 feet south of Vinci Avenue Bridge.

Sacramento Weir and Bypass

The Sacramento Bypass is located in Yolo County approximately 4 miles west of Sacramento along the northern edge of the city of West Sacramento. The Sacramento Weir runs along the west bank of the Sacramento River and separates the river from the Bypass. The Sacramento Bypass is

located in a rural area owned by the State of California and operated as the Sacramento Bypass Wildlife Area.

(2) Size

Erosion Protection

Approximately 17 acres of fill would be placed in the American River. Approximately 15 acres of fill would be placed into the Sacramento River.

Overtopping Measures

Approximately 1 acre of fill would be placed in vernal pool habitat.

Sacramento Weir and Bypass

Approximately 14 acres of fill would be placed in canals and drainage ditches in the widened Sacramento Bypass.

(3) Type of Site

Erosion Protection

To construct the erosion protection measures, riprap will be placed in the American and Sacramento River along the waterside slope of the levee.

Overtopping Measures

To construct the levee raise along the Magpie Creek levee, soil will be placed along the landside of the levee in vernal pool habitat.

Sacramento Weir and Bypass

To relocate the Sacramento Bypass levee, soil fill will be placed in canals and drainage ditches.

(4) Type of Habitat

Erosion Protection

Habitat types along the footprint of the bank protection measures include valley foothill riparian habitat and open water habitat. These habitat types are described below.

Valley Foothill Riparian Habitat. Valley foothill riparian habitat occurs along the Sacramento and American River levees. The overstory of the riparian habitat consists of mature, well-established trees: Fremont cottonwood (*Populus fremontii ssp. fremontii*), valley oak (*Quercus lobata*), black willow (*Salix gooddingii*), and box elder (*Acer negundo var. californicum*). During the reconnaissance-level field visits, Oregon ash (*Fraxinus latifolia*), western sycamore (*Platanus racemosa*), and white alder (*Alnus rhombifolia*) were also observed. The shrub layer consists of smaller trees and shrubs; representative species observed were poison oak (*Toxicodendron diversilobum*), sandbar willow (*Salix exigua*), and Himalayan blackberry (*Rubus discolor*). Elderberry shrubs (*Sambucus mexicana*), the host plant of the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), which is Federally listed as threatened, were observed in the riparian habitat along the Sacramento River north and south levees. Riparian habitat is listed as a sensitive natural community by the CNDDB (2009).

Open Water. The American and Sacramento Rivers are located within the study area and would both be impacted by placement of fill into waters of the U.S. Both of these rivers are navigable waterways that are jurisdictional under Section 404 of the Clean Water Act.

Overtopping Measures

Habitat types in the footprint of the levee raises at Magpie Creek include potential vernal pool habitat. Vernal pool habitat is described below.

Vernal Pools. Vernal pools are depressions in areas where a hard underground layer prevents rainwater from draining downward into the subsoils. When rain fills the pools in the winter and spring, the water collects and remains in the depressions. In the springtime the water gradually evaporates away, until the pools become completely dry in the summer and fall. Vernal pools support plants and animals that are specifically adapted to living with very wet winter and spring conditions followed by very dry summer and fall conditions. The pools are most beautiful in the spring, when many specially-adapted flowering plants are in full bloom following initial evaporation of surface water. Almost all plants that occur in vernal pools are annuals, meaning they germinate, flower, set seed, and die all within one year. Many vernal pool plant species have seeds that can remain dormant for many years, an adaptation that allows them to survive through periods of drought. Many specially-adapted crustaceans, amphibians, and insects also occur only in vernal pools.

Sacramento Weir and Bypass

Habitat types in the expanded Sacramento Weir and Bypass area include primarily agricultural habitats, such as irrigated grain, row, and field crops. The habitat impacted by placement of fill is primarily open water habitat, as described above for the bank protection sites, in the form of small canals and drainage ditches.

(5) Timing and Duration of Discharge

Erosion Protection

The construction schedule for the ARCF project was estimated based on a 3 month construction window per year due to logistical constraints. Construction would likely occur during the summer months due to special status species work windows and the flood season. Construction of erosion protection measures on the American River would take approximately 9 years. Construction of the overall work proposed for the Sacramento River, including the seepage, slope stability, and height improvements, would take approximately 8 years, with bank protection construction occurring intermittently throughout that time frame.

Overtopping Measures

Construction of the levee raises at Magpie Creek would occur in one construction year. Similar to the erosion protection schedule discussed above, this schedule assumes a 3 month construction window. Construction would likely occur during the summer months due to special status species work windows and the flood season.

Sacramento Weir and Bypass

Relocation of the Sacramento Bypass levee would occur in one construction year. Similar to the erosion protection schedule discussed above, this assumes a 3 month construction window. Construction would likely occur during the summer months due to special status species work windows and the flood season.

h. Description of Disposal Method

Erosion Protection

Erosion protection along the American and Sacramento Rivers would be addressed via either the launchable rock trench method or by standard bank protection. There are no erosion protection measures proposed for the East Side Tributaries. Construction methods for the bank protection and launchable rock trench measures are described below.

Bank Protection

This measure consists of placing riprap on the river's bank, and in some locations on the levee slope, to prevent erosion (Figure 2). Bank protection is proposed along the American and Sacramento River and would result in the placement of fill in waters of the U.S. Construction methods are described below.

When necessary, the eroded portion of the bank would be filled and compacted prior to the rock placement. The sites would be prepared by clearing and stripping the site prior to construction. Small vegetation and loose materials would be removed. In most cases, large vegetation would be permitted to remain at these sites. Temporary access ramps would be constructed, if needed, using imported borrow material that would be trucked on site.

Riprap would be imported from an offsite location via haul trucks and temporarily stored at a staging area located in the immediate vicinity of the construction site. A loader would be used to move riprap from the staging area to an excavator that will be placing the material. The excavator would place a large rock berm in the water up to an elevation slightly above the mean summer water surface. A planting trench would be established on this rock surface for revegetation purposes. The excavator would either be working from the top of the bank placing riprap on the bank beneath it and in the water, or from on top of the rock berm that it established.

The placement of rock onto the levee slope would occur from atop the levee. Rock placement from atop the levee would require one excavator and one loader for each potential placement site. The loader would then bring the rock from a staging area to the excavator and the excavator then places it on the waterside of the levee slope

The riprap would be placed on the existing bank at a slope varying from 2V:1H to 3V:1H depending on site specific conditions. After riprap placement has been completed, a small planting berm would be constructed in the rock where feasible to allow for some revegetation of the site, outside of the vegetation free zone as required by ETL 1110-2-583. This vegetation will be designed on a site specific basis to minimize the O&M responsibility of the LMA and in such a way to not impact the hydraulic conveyance of the channel.

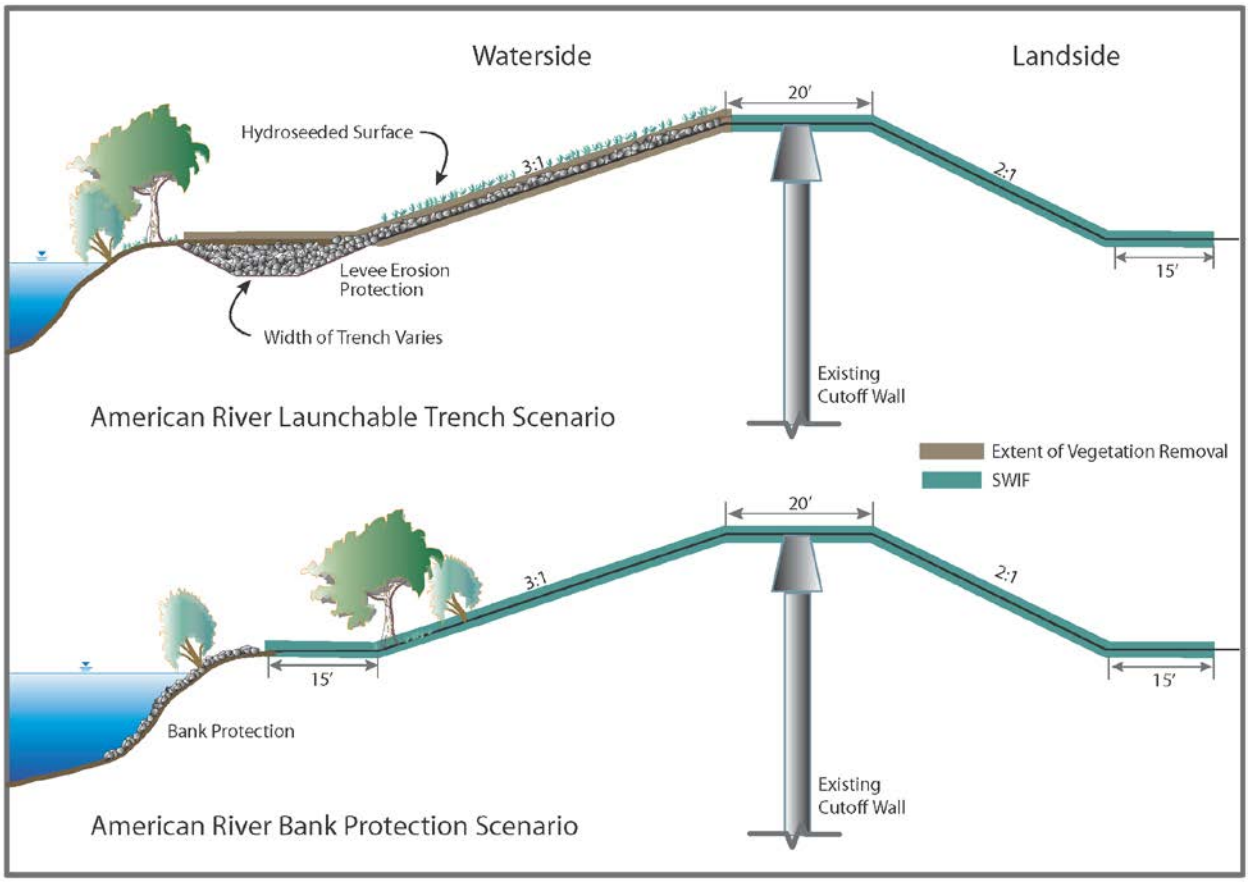

Figure 2. Erosion Protection Measures Typical Design.

Launchable Rock Trench

This measure includes construction of a launchable rock filled trench, designed to deploy once erosion has removed the bank material beneath it (Figure 2). All launchable rock trenches would be constructed outside of the natural river channel. As a result, launchable rock trenches would be above the ordinary high water mark and fill materials would not be placed into waters of the U.S. However, this measure is described in detail below because it is a practicable alternative to the bank protection measure.

The vegetation would be removed from the footprint of the trench and the levee slope prior to excavation of the trench. The trench configuration would include a 2:1 landside slope and 1:1 waterside slope and would be excavated at the toe of the existing levee. All soil removed during trench excavation would be stockpiled for reuse or disposal. The bottom of the trench would be constructed close to the summer mean water surface elevation in order to reduce the rock launching distance and amount of rock required.

After excavation, the trench would be filled with riprap that would be imported from an offsite location. After rock placement the trench would be covered with a minimum of 3 feet of the stockpiled soil to allow for planting over the trench. Rock placed on the levee slope would be covered with the stockpiled soil. All disturbed areas would be reseeded with native grasses and small shrubs where appropriate. Some vegetation could be permitted over the trench if planted outside the specified vegetation free zone required by ETL 1110-2-583. This vegetation would likely be limited to native grasses, shrubs, and trees with shallow root systems to ensure that they do not limit the functionality of the trench during a flood event. This vegetation would only be permitted if they establish in a way that does not put undue burden on the maintaining agency and in locations that do not interfere with the conveyance capacity of the channel.

Overtopping Measures

To begin levee raising, the area would be cleared, grubbed, stripped, and, where necessary, portions of the existing embankment would be excavated to allow for bench cuts and keyways to tie in additional embankment fill. Excavated and borrow material (from nearby borrow sites) would be stockpiled at staging areas. Haul trucks or scrapers would bring borrow materials to the site, which would then be spread evenly and compacted according to levee design plans. The existing levee centerline would be shifted landward, where necessary in order to meet the Corps' standard levee footprint requirements. The levee crown patrol road would be re-established and a new toe access corridor would be added 10 feet landward of the levee toe in areas where levee raises are required.

Sacramento Weir Bypass

For this alternative, the existing north levee of the Sacramento Bypass would be degraded and a new levee constructed approximately 1,500 feet to the north. A new weir would be extended north of the existing Sacramento Weir without impacting the existing structure. The new weir will be extended approximately 1,500 feet and include a seepage cutoff wall below. The increase in Bypass flows through the new weir would occur during high water events only, when the flow released from Folsom Dam on the American River exceeds 115,000 cfs. The existing Sacramento Weir and Bypass would be operated consistent with current conditions based on the stage at the I Street gage.

The new north levee of the Sacramento Bypass will be constructed per new levee construction standards, including 3H:1V waterside and landside slopes and a minimum crest width of 20 feet. As both the existing north and south levees have experienced underseepage and slope stability related distress, the new north levee would include a 300-foot wide drained landside seepage berm (5 feet thick at the landside levee toe tapering to 3 feet thick at the berm toe and constructed of random fill with a 1.5-foot thick drainage and filter layer at the base) with a system of relief wells located at least 15 feet landward of the berm toe and spaced at 200-foot intervals. Existing infrastructure, including roads, railways, canals, and pump stations will be relocated to maintain current operation. Placement of fill into waters of the U.S. would occur as a result of the relocation of canals and drainage ditches associated with the Bypass widening.

II. Factual Determinations

a. Physical Substrate Determinations (Sections 230.11 (a) and 230.20)

(1) Comparison of Existing Substrate and Fill

The project area generally consists of deep soils derived from alluvial sources, which range from low to high permeability rates and low to high shrink-swell potential. Soils immediately adjacent to the Sacramento River are dominated by deep, nearly level, well-drained loamy and sandy soils. The natural drainage is good, and the soils have slow to moderate subsoil permeability. The river terraces consist of very deep, well drained alluvial soils. The porous nature of the soils underneath the existing levee system is an important consideration for the design of levee improvements within the ARCF GRR study area. The major source of sediments deposited in the ARCF GRR study area is from the erosion of the Sierra Nevada mountain range and foothills to the east of the Sacramento Valley. Naturally occurring asbestos (NOA) is known to occur in the foothill metamorphic belt. Therefore, NOA may be present; however, the likelihood of project area soils containing significant concentrations of NOA is low due to the long distance from the source rock.

As discussed in Section If(1) above, fill material for bank protection construction would consist of large stone riprap ranging from 18 to 36 inch large to armor the waterside slope with a fine sand or silt fill over the top to allow for vegetation planting on the berms. The proposed sand or silt for the bank protection would come from clean, imported fill material. The fill material for the overtopping measures and the Sacramento Bypass levee relocation would consist of silty and clayey soils with a minimum content of 20% fine particles, a liquid limit less than 45, and a plasticity index between 7 and 15. No organic material or debris may be present in the soil. The proposed soil would be clean and would be imported from either a tested and approved borrow site, or from an commercial source.

(2) Changes to Disposal Area Elevation

Erosion Protection

Due to the placement of rock bank protection along the river banks, there would be an increase in elevation of approximately 1.5 feet in the locations where fill is placed in the waters of the U.S.

Overtopping Measures

Raising the Magpie Creek levee would increase the ground elevation in the footprint of the fill placement by anyway from a few inches to a few feet, depending on the slope of the levee.

Sacramento Weir and Bypass

There would be a significant increase in elevation in the footprint of the new Sacramento Bypass levee, as the levee would be constructed above the existing ground surface elevation.

(3) Migration of Fill

Erosion Protection

The erosion repairs within the project area is likely to somewhat reduce the sediment supply for riverine reaches directly downstream because the riprap would hold the bank or levee in place. However, from a system sediment perspective, the bank material that would be protected in the project reaches is not a major source of sediment compared to the upstream reaches of the Sacramento, Feather and especially the Yuba River systems.

A typical bank protection site has an approximate life span of 50 years. Over that time period, there would be a natural erosion and migration of fill occurring at the site; however it would occur at a slightly slower rate than natural conditions if no bank protection were to occur. The sites would be designed to avoid significant migration of newly placed fill through the use of geotextiles and the establishment of on-site vegetation.

Overtopping Measures

Sediment associated with the levee raise at Magpie Creek is not expected to migrate over time. The soil placed would be compacted and would be seeded with natural grasses to avoid long-term erosion impacts.

Sacramento Weir and Bypass

Sediment placed to construct the relocated Sacramento Bypass levee is not expected to migrate over time. The Bypass is dry the majority of the time. During a flood event there would be some natural erosion associated with flood flows in the bypass, however, the levee would be constructed in a manner to ensure that it would not significantly degrade during a typical flood event.

(4) Duration and Extent of Substrate Change

Erosion Protection

There would be a permanent change of substrate on the riverbanks from alluvial soils to stone riprap. However the rock berms would be covered with a silty or sandy layer of soil in order to allow for the planting of vegetation along the river banks. This silty or sandy layer of soil would be of a similar substrate type to the existing condition.

Overtopping Measures

There would be a permanent change of substrate from vernal pool hardpan soils to the silty clayey soils described above for levee construction.

Sacramento Weir and Bypass

There would be a permanent change of substrate in the drainage canals to the silty clayey soils described above for levee construction. However, relocation of the Sacramento Bypass levee would not substantially alter the majority of the soil in the footprint of the new levee construction. Since the existing levee would be used to construct the new levee, and the borrow material used in the levees likely originated in the Bypass footprint, these soils would be consistent with the soil content of the overall area.

(5) Changes to Environmental Quality and Value

Potential impacts to water quality include increased turbidity during bank protection construction, runoff of exposed soils, and cement, slurry, or fuel spills during construction. Emissions from construction equipment, haul trucks, and barges also pose a potential impact to environmental quality and value during the duration of construction activities. BMPs would be implemented during construction to reduce these impacts to less than significant. There would be a permanent change in substrate in the footprint of the placement area; however these sites would be designed to be as consistent as feasible with natural riverbanks through the placement of silt over the rock layer and the planting of on-site shrubby vegetation and native grasses. To the extent feasible, large trees on the lower waterside slope would be left in place to maintain shaded riverine aquatic habitat for special-status fish species.

Alternative 2 would reduce water surface elevation in the Sacramento River downstream of the confluence of the American River without significantly increasing water surface elevation in the Yolo Bypass downstream of the confluence of the Sacramento Bypass. Impacts associated with the placement of fill in waters of the U.S. to water and air quality are the same as Alternative 1, with the

addition of the 14 acres of canals and drainage ditches that would be permanently impacted as part of the Sacramento Bypass widening. However, Alternative 2 would also create approximately 300 acres of new floodplain habitat within the widened Sacramento Bypass. Impacts to existing soil and substrate conditions are the same as Alternative 1.

(6) Actions to Minimize Impacts

Alternatives 1 and 2 require the same mitigation measures to reduce impacts to environmental quality:

- Implementation of SMAQMD's Basic Construction Emission Control Practices and other BMPs to control fugitive dust, runoff, and emissions.
- Preparation of a Stormwater Pollution. Protection Plan, Spill Prevention Control and Countermeasures Plan, and a Bentonite Slurry Spill Contingency Plan.
- Conduct earthwork during low flow periods (July 1 through November 30).
- To the extent possible, stage construction equipment and materials on the landside of the subject levee reaches in areas that have already been disturbed.
- Minimize ground and vegetation disturbance during project construction by establishing designated equipment staging areas, ingress and egress corridors, spoils disposal and soil stockpile areas, and equipment exclusion zones prior to the commencement of any grading operations.
- Stockpile soil on the landside of the levee reaches, and install sediment barriers (e.g., silt fences, fiber rolls, and straw bales) around the base of stockpiles to intercept runoff and sediment during storm events. If necessary, cover stockpiles with geotextile fabric to provide further protection against wind and water erosion.
- Install sediment barriers on graded or otherwise disturbed slopes as needed to prevent sediment from leaving the project site and entering nearby surface waters.
- Install plant materials to stabilize cut and fill slopes and other disturbed areas once construction is complete. Plant materials could include an erosion control seed mixture or shrub and tree container stock. Temporary structural BMPs, such as sediment barriers, erosion control blankets, mulch, and mulch tackifier, could be installed as needed to stabilize disturbed areas until vegetation becomes established.
- Conduct water quality tests specifically for increases in turbidity and sedimentation caused by construction activities.

b. Water Circulation, Fluctuation, and Salinity Determinations

(1) Alternation of Current Patterns and Water Circulation

Since Alternative 1 consists of fix-in-place levee improvements, implementation of these measures would have no effect on current patterns and water circulation.

Alternative 2 would result in a diversion of flows from the Sacramento River to the Yolo Bypass that would slightly raise water surface elevations in the Yolo Bypass during frequent events (10 year) compared to both the existing and future without project conditions. To avoid potential effects to the Yolo Bypass, the widened portion of the Sacramento Weir will only be operated when the release from Folsom Dam is increased to above 115,000 cfs. With the Folsom Dam improvements in place, releases from Folsom Dam would be above 115,000 cfs for flood events greater than 1/100 ACE event.

Therefore, for events up to and including the 1/100 ACE event, only the existing weir will be operated per the criteria previously established. For events greater than the 1/100 ACE event when the release from Folsom Dam will go above 115,000 cfs, the new weir will be opened. As a result of the increased flood storage space and anticipatory releases at Folsom Dam, this translates into a reduction of flows into the Yolo Bypass with Alternative 2 in place compared to the existing conditions. Table 3 compares the flows at various locations for the Existing, Future Without Project, and with Alternative 2 in place. For the 1/100 ACE event and greater, the benefits of the Folsom Dam improvements would be realized in the form of reduced flows compared to the Existing condition.

Table 3. Comparison of 10-, 100-, and 200-year Frequency Flows under Various Conditions.

10 year event	**Existing Condition**	**Future Without Project Condition (also Alternative 1)**	**Alternative 2**
American River	43,000 cfs	72,000 cfs	72,000 cfs
Sacramento Bypass	50,000 cfs	66,000 cfs	66,000 cfs
Yolo Bypass below Sac Bypass	270,000 cfs	296,000 cfs	296,000 cfs
100 year event	**Existing**	**Future Without Project and Alt. 1**	**Alt. 2 (TSP)**
American River	145,000 cfs	115,000 cfs	115,000 cfs
Sacramento Bypass	131,000 cfs	115,000 cfs	115,000 cfs
Yolo Bypass below Sac Bypass	555,000 cfs	535,000 cfs	535,000 cfs
200 year event	**Existing**	**Future Without Project and Alt. 1**	**Alt. 2 (TSP)**
American River	320,000 cfs	160,000 cfs	160,000 cfs
Sacramento Bypass	183,000 cfs	149,000 cfs	164,000 cfs
Yolo Bypass below Sac Bypass	656,000 cfs	631,000 cfs	643,000 cfs

Although Alternative 2 would result in the creation of a new drainage area within the Sacramento Bypass, the area would be contained within the levee system and would not result in substantial additional erosion, siltation, or runoff. The expanded bypass would not create or contribute flows in excess of the existing capacity of the system, as shown in Table 12 above.

(2) Interference with Water Level Fluctuation

Because the Sacramento and American River systems are regulated by upstream dams which allow a specific amount of water to be released into systems, the Alternative 1 and the no action/no project alternative would not change water level fluctuation patterns. Alternative 2 would change the water level fluctuation patterns by reducing and stabilizing the maximum water surface elevations on the Sacramento River during flood events, as described in Table 3 above.

Potential implications of the simulated long-term changes in bed profiles can be increased stress along the toe of the project levees or overbank berms in the degradational reaches, which may result in increased scour along unrevetted channel sections. In the aggradational reaches, an increase in bed elevations may result in higher flood stages and reduced flood conveyance.

(3) Salinity Gradients Alteration

Salinity gradients would not be affected, as salinity normally only increases in the river system during low flow events when there is a higher than average tidal influx from the Delta. With-project conditions in the system would remain consistent with existing conditions during normal and low flow periods. Flows would be slightly altered during high water events, however the flood flows during these events would ensure that salinity is not intruding into the riverine system.

(4) Effects on Water Quality

The Basin Plan states that where ambient turbidity is between 5 and 50 nephelometric turbidity units (NTUs), projects would not increase turbidity on the Sacramento River by more than 20 percent above the ambient conditions. Furthermore, if the ambient diurnal variation in turbidity fluctuates in and out of the 5 and 50 NTUs threshold, the Basin Plan states that averaging periods can be applied to data to determine compliance. For example, during the summer months, the Sacramento River turbidity could be less than 50 NTUs, and during the winter months, the turbidity could be more than 50 NTUs because of the higher flow rate causing more river scouring. Thus, the monthly average was calculated using hourly CDEC data and is presented in Table 3-3 below. Specific construction activities that are part of the potential alternatives would need to comply with the above-stated thresholds for turbidity.

Water quality impacts that could result from project construction activities and project operations were evaluated based on the construction practices and materials that would be used, the location and duration of the activities, and the potential for degradation of water quality or beneficial uses of project area waterways.

Table 3-3. Monthly Average Total Suspended Sediment and Turbidity for the Sacramento River at Freeport from 1997 to 2007.

Month	Discharge (cfs)	TSS (mg/L)	TSS Load (tons)	Turbidity (NTU)
January	41,414	104	11,670	64
February	44,084	83	9,839	68
March	39,586	70	7,476	15
April	28,552	51	3,946	11
May	25,152	48	3,279	12
June	21,461	30	1,741	17
July	20,432	37	2,019	21
August	18,235	27	1,332	9
September	16,121	29	1,266	10
October	11,950	29	940	6
November	13,612	24	868	8
December	25,105	81	5,463	12

Note: Flow and TSS data are from the USGS and are presented as monthly average from 1997 to 2007. Turbidity data are from CDEC from March 2007 to January 2009 and also are presented as a monthly average. Turbidity data are from the Sacramento River at Hood, a few river miles downstream from the USGS station.
Source: USGS 2013; DWR 2012b.

Where bank protection construction is proposed, riprap would be placed along the river bank to prevent erosion. The placement of riprap along the river banks would temporarily generate increased turbidity in the immediate vicinity of the construction area. Additionally, placement of riprap in the water could result in a sediment plume, generated from the channel bottom and levee side, becoming suspended in the water and could generate turbidity levels above those identified as acceptable by the Basin Plan. Turbidity effects from landside construction (e.g., vehicle, staging, placement of construction equipment) would be limited to stormwater runoff carrying loose soil from staging areas and construction vehicle access areas. Best management practices would be implemented to reduce the effect of runoff into the stormwater system to less than significant. Best management practices include such things as coir mats or hay bales to prevent runoff, rock groins to retain sediment, sand bags to prevent erosion, and drain screens to prevent sediment from traveling outside the construction area footprint and into the storm drains system.

As rock riprap is placed in the open water, significant indirect effects would result as the sediment and turbidity plume would drift further downstream and later affect the water qualify in those areas found further downstream of the project area. By implementing avoidance and minimization measures impacts could be reduced to less than significant.

Effects to water quality for Alternative 2 would be the same as Alternative 1 with the additional affects associated with the widening of the Sacramento Weir and Bypass. Construction of the new north levee would occur when water is not flowing through the bypass, and therefore there would be not impacts to water quality during construction of the new north levee of the bypass. However, effects could occur during the construction of the expanded weir along the Sacramento River. There is a potential for water quality impacts to occur if the weir is constructed in a way that debris or other construction materials could enter the Sacramento River. However, it is likely that the weir could be constructed behind the existing levee, which would result in no impacts to water quality.

(a) Water Chemistry

The potential of hydrogen (pH) is a unit for measuring the concentration of hydrogen ion activity in water and is reported on a scale from 0 to 14. If a solution measures less than 7, it is considered acidic. If a solution measures more than 7, it is considered basic, or alkaline. If a solution measures 7, it is considered neutral. Many biological functions occur only within a narrow range of pH values. The Basin Plan objective for pH is between 6.5 and 8.5. Furthermore, discharges cannot result in changes of pH that exceed 0.5. The monthly average pH of the Sacramento River from 2003 to 2009 remained stable throughout the year (Table 3-4). Construction materials such as concrete or other chemicals could affect the pH of the Sacramento River if a discharge were to occur. The proposed materials and construction activities have the potential to affect water chemistry during the duration of construction. Construction contractors would be required to prepare and implement a SWPPP and comply with the conditions of the NPDES general stormwater permit for construction activity. The contractor would be required to obtain a permit from the Central Valley RWQCB detailing a plan to control any spills that could occur during construction. The plan would describe the construction activities to be conducted, BMPs that would be implemented to prevent discharges of contaminated stormwater into waterways, and inspection and monitoring activities that would be conducted.

(b) Salinity

The proposed materials and construction activities are not expected to affect salinity.

(c) Clarity

Placement of fill materials would temporarily reduce clarity due to an increase in total suspended solids within the project area. Clarity is not expected to be substantially affected outside the

immediate project area. However, the reduction of clarity caused by construction activities would be short in duration and would return to pre-construction levels upon project completion.

(d) Color

The proposed project is expected to affect color only during fill activities. Placement of fill materials would temporarily induce a color change due to an increase in turbidity. These effects would be consistent with those discussed above for clarity. The change in color caused by construction activities would be short in duration and would return to pre-construction levels upon project completion.

(e) Odor

The proposed project would not result in any major sources of odor, and the project would not involve operation of any of the common types of facilities that are known to produce odors (e.g., landfill, wastewater treatment facility). Odors associated with diesel exhaust emissions from the use of onsite construction equipment may be noticeable from time to time by adjacent receptors. However, the odors would be intermittent and temporary and would dissipate rapidly from the source with an increase in distance. Furthermore, as required by CARB regulation 13 CCR 2449(d)(3), no in-use off-road diesel vehicles may idle for more than 5 consecutive minutes. Therefore, this direct effect would be less than significant. In addition, implementation of mitigation measures, which are required under other air quality effects, would further reduce exhaust emissions and provide advanced notification of construction activity.

(f) Taste

The proposed materials and construction activities are not expected to affect taste.

(g) Dissolved Gas Levels

The proposed materials and construction activities are not expected to affect dissolved gases.

(h) Temperature

Construction activities have the potential to create substantial turbidity, thus affecting water temperature. Proposed mitigation measures, specifically conducting work during low flow periods and installing sediment barriers to reduce sediment from entering waterways would be required to control turbidity and the mobilization of pollutants that may be present in sediments. Most large trees on the lower waterside slope would be left into place to maintain the shaded riverine habitat corridor, which would help to stabilize the long-term water temperature levels after construction. Additionally, shrubs would be planted on the bank protection planting berms during construction to allow the vegetative cover near the banks to redevelop long-term.

(i) Nutrients

The proposed materials and construction activities have the potential to affect nutrient levels in the water. Release of suspended sediments during construction could potentially cause turbidity thresholds for metals and nutrients to be exceeded. Turbidity would be controlled outside the working area using a combination of BMPs as appropriate. Development and implementation of an approved SWPPP would also prevent release of excess nutrients. Long-term nutrient levels would not be significantly altered by project construction because existing vegetation on the waterside slopes of the levee would be protected in place, and the shaded riverine aquatic corridor would still remain a source of nutrients for the rivers. In addition, nutrients from the upstream watershed would remain in the system.

(j) Eutrophication

The project is not expected to contribute excess nutrients into the stream or promote excessive plant growth due to BMPs and the high content of rock in disposal material.

c. Suspended Particulate/Turbidity Determinations

(1) Alteration of Suspended Particulate Type and Concentration

Where bank protection construction is proposed, riprap would be placed along the river bank to prevent erosion. The placement of riprap along the river banks would temporarily generate increased turbidity in the immediate vicinity of the construction area. Additionally, placement of riprap in the water could result in a sediment plume, generated from the channel bottom and levee side, becoming suspended in the water and could generate turbidity levels above those identified as acceptable by the Basin Plan. Turbidity effects from landside construction (e.g., vehicle, staging, placement of construction equipment) would be limited to stormwater runoff carrying loose soil from staging areas and construction vehicle access areas. Best management practices would be implemented to reduce the effect of runoff into the stormwater system to less than significant. Best management practices include such things as coir mats or hay bales to prevent runoff, rock groins to retain sediment, sand bags to prevent erosion, and drain screens to prevent sediment from traveling outside the construction area footprint and into the storm drains system.

As rock riprap is placed in the open water, significant indirect effects would result as the sediment and turbidity plume would drift further downstream and later affect the water qualify in those areas found further downstream of the project area. By implementing avoidance and minimization measures, discussed in Section 3.5.6 of the ARCF GRR EIS/EIR, impacts could be reduced to less than significant.

(2) Particulate Plumes Associated with Discharge

Placement of riprap in the water could result in a sediment plume, generated from the channel bottom and levee side, becoming suspended in the water and could generate turbidity levels above those identified as acceptable by the Basin Plan. As rock riprap is placed in the open water, significant indirect effects would result as the sediment and turbidity plume would drift further downstream and later affect the water qualify in those areas found further downstream of the project area. By implementing avoidance and minimization measures, discussed in Section 3.5.6 of the ARCF GRR EIS/EIR, impacts could be reduced to less than significant.

(3) Changes to Environmental Quality and Value

There could be significant affects to water quality due to increased turbidity during construction, as discussed above. Additionally, on the Sacramento River, the use of barges to install the riprap could cause additional turbidity as the barge moves into the site and anchors. This is considered a significant affect to water quality during construction. Once construction is complete there could be reduced turbidity in the direct vicinity of the site because there would be no exposed soil to erode and deposit into the river. Further, the bank protection sites would include the installation of riparian vegetation which could slow the flows down and reduce turbidity during high flows. This alternative would result in significant effects to water quality during construction activities. Additionally, upstream and downstream of the bank protection area could erode because no rock protection is present now, however, this could occur with or without the construction of the project.

Construction contractors would be required to prepare and implement a SWPPP and comply with the conditions of the NPDES general stormwater permit for construction activity. The contractor would be required to obtain a permit from the Central Valley RWQCB detailing a plan to control any spills that could occur during construction. The plan would describe the construction activities to be conducted, BMPs that would be implemented to prevent discharges of contaminated stormwater into waterways, and inspection and monitoring activities that would be conducted.

(4) Actions to Minimize Impacts

Environmental commitments included in the project to reduce the potential for impacts to water quality include: preparation and implementation of the SWPPP, Spill Prevention Control and Countermeasures Plan (SPCCP), and a bentonite slurry spill contingency plan (BSSCP).

<u>d. Contaminant Determinations</u>

The proposed project is not expected to add contaminants to any body of water; however, if there were a release of contaminants into adjacent water bodies, that could result in significant effects. Therefore, BMPs are proposed during construction to ensure that no contaminants enter the waterways.

Under Alternative 1, construction activities would involve the use of potentially hazardous material, such as fuels, oils and lubricants, and cleaners, which are commonly used in construction projects. Construction contractors would be required to use, store, and transport hazardous materials in compliance with Federal, State, and local regulations during project construction and operation. Testing of borrow sites would occur prior to the use of material and sites which have contaminated soils would not be used for this project. Any hazardous substance encountered during construction would be removed and properly disposed of by a licensed contractor in accordance with Federal, State, and local regulations. Compliance with applicable regulations would reduce the potential for accidental release of hazardous materials during transport and construction activities. The risk of significant hazards associated with the transport, use, and disposal of these materials is low.

Project areas would be tested for HTRW contaminants prior to construction, and any materials found would be disposed of in accordance with all Federal, State, and local regulations at an approved disposal site. Implementation of these mitigation measures would reduce the impacts from hazardous materials at project sites to less than significant. If significant time has elapsed between approval of this document and construction, additional investigations should be done to reduce the risk of encountering a site during construction. If construction activities would occur in close proximity to sites listed in the existing conditions section, a Phase II ESA should also be conducted. This would further reduce the risk of exposure to workers and the public during construction and assist in the remediation planning.

Alternative 2 would have the same impacts as Alternative 1, with the additional affects associated with the expansion of the Sacramento Weir and Bypass. A known HTRW site, the Old Bryte Landfill, is currently present within the area proposed for the expanded Sacramento Bypass. No construction activities would occur in proximity to this site until the site has been completely remediated and meets all Federal, State, and local regulatory requirements. Therefore, this alternative would have no impacts.

Compliance with applicable regulations would reduce the potential for accidental release of hazardous materials during construction of both Alternatives 1 and 2. The contractor would also be required to prepare a SWPPP, which details the contractors plan to prevent discharge from the construction site into drainage systems, lakes, or rivers. This plan would include BMPs, as detailed in Section 3.5.6 of the ARCF GRR EIS/EIR, which would be implemented at each construction site.

In addition, a SPCCP would be prepared prior to project construction. An SPCCP is intended to prevent any discharge of oil into navigable water or adjoining shorelines. The contractor would develop and implement an SPCCP to minimize the potential for adverse effects from spills of hazardous, toxic, or petroleum substances during construction and operation activities. The SPCCP would be completed before any construction activities begin. Implementation of this measure would comply with state and Federal water quality regulations. The SPCCP would describe spill sources and spill pathways in addition to the actions that would be taken in the event of a spill (e.g., an oil spill from engine refueling would be immediately cleaned up with oil absorbents). The SPCCP would outline descriptions of containments facilities and practices such as doubled-walled tanks, containment berms, emergency shut-offs, drip

pans, fueling procedures and spill response kits. It would also describe how and when employees are trained in proper handling procedure and spill prevention and response procedures.

e. Aquatic Ecosystem and Organism Determinations

(1) Effects on Plankton

Plankton are drifting organisms that inhabit the pelagic zone of oceans, seas, or bodies of fresh water. Project construction activities would be temporary and short-term. The only short-term effect would be a less abundant supply of plankton for the Delta smelt, and other fish and aquatic organisms. With implementation of mitigation measures and BMPS, this project would not introduce materials that would disrupt the nutrient supply for plankton, and as a result effects to plankton would be temporary and not significant.

(2) Effects on Benthos

Benthic organisms may be disturbed during construction, but following construction, the rock berm would be covered with a silty soil layer, and native benthic organisms would be expected to recolonize the area.

(3) Effects on Nekton

Nekton are actively swimming aquatic organisms that range in size and complexity from plankton to marine mammals. Native fish present in the project area can be separated into anadromous species and resident species. Native anadromous species include four runs of Chinook salmon, steelhead trout, Delta smelt, and green sturgeon. All of these anadromous species are expected to use habitat in parts of the study area.

Within the ARCF GRR study area, the Sacramento River and Sacramento Bypass are designated critical habitat for winter-run Chinook salmon. Critical habitat for spring-run Chinook salmon includes all river channels and sloughs within the ARCF study area on the Sacramento River and on the American River from the confluence to the Watt Avenue bridge (NMFS 2006b). Critical habitat for Central Valley steelhead includes the stream channels and the lateral extent as defined by the ordinary high-waterline or bank-full elevation in the designated stream reaches of the Sacramento and American River, NEMDC and Dry/Robla creek portions of the ARCF project area. Critical habitat for delta smelt consists of all water and all submerged lands below ordinary high water and the entire water column bounded by and contained in Suisun Bay (including the contiguous Grizzly and Honker bays); the length of Goodyear, Suisun, Cutoff, First Mallard (Spring Branch), and Montezuma sloughs; and the contiguous waters in the Delta (USFWS 1994). Critical habitat for delta smelt is designated in the following California counties: Alameda, Contra Costa, Sacramento, San Joaquin, Solano, and Yolo (USFWS 2003). Designated critical habitat for the southern DPS of green sturgeon includes the Sacramento River downstream of Keswick Dam, the Feather River downstream of Oroville Dam, and the Yuba River downstream of Daguerre Dam;

portions of Sutter and Yolo Bypasses; the legal Delta, excluding Five Mile Slough, Seven Mile Slough, Snodgrass Slough, Tom Paine Slough and Trapper Slough; and San Francisco, San Pablo, and Suisun bays.

Under Alternative 1, rock placement would most likely disturb the native resident fish by increasing vibration, water turbulence, and turbidity, causing them to move away from the area of placement. In some pelagic native juvenile species utilizing the near shore habitat for cover, moving away from that cover could put them at a slight risk of predation. Direct effects were not considered significant to resident native fish species because it was determined that existing conditions would not be worsened by project construction which includes the creation of planting berms to provide shade and instream woody material elements of SRA habitat. The natural bank element of SRA would be lost with the placement of rock along the levee slope. Over time sediment would settle into the rock voids and provide similar substrate characteristics as a natural bank. The direct effects would also not result in a substantial reduction in population abundance, movement, and distribution. Direct effects on the Sacramento River in relation to rock placement would be the same as described above for the American River. The East Side Tributaries construction of cutoff walls and flood walls would take place above the waterline which would not have significant direct effects.

Effects associated with Alternative 2 would be the same as described in Alternative 1 above. Proposed construction in the Sacramento Bypass would take place during the dry season when no water would be flowing through the project area from the Sacramento River. There would be no significant direct effects to native fish populations because they would not be present in the construction footprint during the proposed construction. By widening the Sacramento Weir and Bypass, the project would create additional floodplain habitat, which could benefit native fish consistent with the results of the Knaggs Ranch Study. The increase of floodplain habitat could increase opportunities for successful rearing and feeding during seasonal flooding. As a result, indirect effects of the Sacramento Bypass and Weir widening for native fish species would be considered a benefit to the species.

(4) Effects on Aquatic Food Web

Effects on the aquatic food web, or the plankton, benthic, and nekton communities, would be temporary and less than significant. Indirect effects were not considered significant to resident native fish species because it was determined that existing conditions would not be worsened by project construction, and would not result in a substantial reduction in population abundance, movement, and distribution.

(5) Effects on Special Aquatic Sites

(a) Sanctuaries and Refuges

No sanctuaries and refuges are within the project area.

(b) Wetlands

Because of the natural flow of water in this area, wetlands in the existing bypass are not expected to be impacted by construction of the project. There is a potential for additional wetlands to develop in the additional 300 acres since this land will no longer be farmed. While the loss of rice fields has a negative effect on GGS, which is discussed in Special Status Species (Section 3.8), the conversion of this land back to its natural state would have benefits to other wildlife and could become an expansion of the Sacramento Bypass Wildlife Refuge in Alternative 2. Reasonable effort will be taken in the detailed design of the project to avoid disturbance to existing wetlands and implementation of environmentally sustainable designs. Any destruction, loss, or degradation of wetlands would be compensated through creation of new wetland habitat.

(c) Mud Flats

No mud flats are within the project area.

(d) Vegetated Shallows

No vegetated shallows are within the project area.

(e) Coral Reefs

No coral reefs are within the project area.

(f) Riffle and Pool Complexes

No riffle pool and complexes are within the project area.

(6) Threatened and Endangered Species

Implementation of Alternative 1 or 2 could result in direct effects to VELB if elderberry shrubs are incidentally damaged by construction personnel or equipment. Impacts may also occur if elderberry shrubs need to be transplanted because they are located in areas that cannot be avoided by construction activities. Potential impacts due to damage or transplantation include direct mortality of beetles and/or disruption of their lifecycle.

Construction activities with the potential to affect giant garter snake and their habitat exist with both alternatives. Because avoidance, minimization, and compensation measures would be implemented in accordance with the requirements of the Endangered Species Act (ESA), California Endangered Species Act (CESA) and other relevant regulatory requirements, and the protect would

protect habitat in place and create habitat, potential adverse effects on special-status species and on sensitive habitats would be reduced to a less than significant level. There would be direct affects to Giant Garter Snake (GGS), Fish species, and Swainson's Hawks during construction under Alternatives 1 and 2. Indirect effects would be due to loss of habitat.

Special status fish species use the American and Sacramento Rivers for migration, therefore, cumulative effects for fisheries were evaluated on changes to habitat that could occur at the construction sites and change in conditions downstream of the project areas as a result of construction. Implementation of the project has the potential to contribute to the loss or degradation of sensitive habitats and to adversely affect special-status fish species. These effects could contribute to the species declines and losses of habitat that have led to the need to protect these species under the Federal ESA and CESA.

The ARCF project will seek a vegetation variance from the Corps vegetation policy. If vegetation variance is approved for the ARCF, trees would remain in place along the lower one-third of the levee and provide essential habitat for many special-status fish species. Beyond the existing trees being left in place, plants would be installed within the planting berm and potentially provide habitat where none currently exist due to long term erosion. Habitat would be replaced for species either on-site or in close proximity to lost habitat for affected species. BMPs discussed in Section 3.5.6 of the ARCF EIS/EIR would be implemented during construction to prevent mortality of endangered or threatened species.

Cumulative effects GGS and their habitat was evaluated within the construction area, haul routes, borrow sites, and immediately adjacent to construction activities. Because avoidance, minimization, and compensation measures would be implemented in accordance with the requirements of the ESA, CESA, and other relevant regulatory requirements, and the project would protect habitat in place and create habitat, potential adverse effects on special-status species and on sensitive habitats would be reduced to a less than significant level. Additionally, other project that could occur in the area would also be implemented in accordance with the requirements of the ESA and CESA.

With various projects being considered in the Sacramento and Delta region, lands available for mitigation and compensation could become difficult to locate. This would be especially true for waterside riparian habitat along the Sacramento River.

Critical habitat for the vernal pool tadpole shrimp is designated in the vicinity of the study area on lands surrounding Mather Field. There is no critical habitat for vernal pool fairy shrimp in the study area. However, there is the potential for one acre of vernal pool habitat to be impacted by the project, as discussed above. During the design phase of the project, a wetland delineation would be conducted near Magpie Creek to verify the estimated impact. If necessary, mitigation would be conducted for this one acre of impact either by purchasing credits at a mitigation bank, or through the conservation and improvement of a parcel of land being purchased as an overflow area near Magpie Creek.

(7) Other Wildlife

Wildlife effects associated with the construction are expected to be temporary and no additional measures to minimize effects are needed for fill occurring in the area. Under Alternative 1, construction of levee improvements and vegetation removal would result in significant loss of vegetation and wildlife habitat on the landside of the Sacramento River Parkway, and along Arcade Creek. Alternative 2 would have the same impacts on the project area in addition to the construction of the Sacramento Weir extension. That would require the widening of the Sacramento Weir and Bypass which would result in a reduced affect to landside vegetation and wildlife.

Because this area is very urbanized under Alternative 1, the primary effects to wildlife would be to avian species. Surveys will be conducted to determine if any nesting birds are present prior to construction. If nesting birds are located adjacent to the project area, coordination with the resource agencies would occur. Trees where nesting birds are located would not be removed while they are actively nesting. However, once the young have fledged the trees may be removed to construct the project. The same impacts apply to Alternative 2 with the addition of construction activities causing any wildlife within the bypass and adjacent areas to relocate to nearby rural lands and away from human activities. Once construction is complete the wildlife is expected to return to the area. Therefore, the impacts to wildlife in the Sacramento Bypass would be less than significant. Both native and non-native fish species, along with some endangered species, use this area of the river and are discussed in Fisheries (Section 3.7) and Special Status Species (Section 3.8).

Mitigation measures would include, when possible, in-kind compensation would be planted on planting berms, on top of launchable rock trenches, or on other lands within the Parkway. A hydraulic evaluation will be conducted to determine whether mitigation could occur in the Sacramento Bypass. Additional mitigation sites are identified in Section 3.6.6 of the ARCF EIS/EIR.

To compensate for the removal of 134 acres of riparian habitat supporting Swainson's hawks and other migratory birds approximately 268 acres of replacement habitat will be created as a mitigation area. Some areas that may be considered for mitigation are Cal Expo and Woodlake. For those mitigation lands within the American River Parkway species selected to compensate for the riparian corridor removal will be consistent with the approved list of trees, shrubs, and herbaceous plants native to the Parkway. Mitigation within the Parkway will prove to be contiguous and create habitat connectivity with wildlife migratory corridors that supports the needs of important native wildlife species, without compromising the integrity of the flood control facilities, the flood conveyance capacity of the Parkway, and Parkway management goals in the Parkway Plan. To comply with the Parkway Plan, lands within the Parkway will be evaluated for compensation opportunities for any riparian habitat removed from Parkway. The exact location of the compensation lands in the Parkway would be coordinated in the design phase of the project with Sacramento County Parks Department and comply with the Parkway Plan objectives and goals. It is assumed that sufficient lands will be available within the Parkway, however, if there is not sufficient land, other locations within Sacramento County

will be identified and pubic coordination will occur. Additional mitigation may be planted in the expanded Sacramento Bypass or on other lands within the Sacramento area that provide similar value to those removed.

(8) Actions to Minimize Impacts

The proposed project is not likely to result in take to these species for either Alternative as long as the applicable conservation and mitigation measures, as detailed in Section 3.8.6 of the ARCF GRR EIS/EIR are adhered to. Among other measures listed in the EIS/EIR, the conclusion of non-jeopardy is based on the Corps' commitments to: (1) avoid direct impacts by maintaining buffers around sensitive habitat (e.g. 100-foot buffer for elderberry shrubs) and/or conducting construction activities outside of sensitive timeframes (e.g. during the giant garter snake active window or fledging period of special-status birds); (2) minimize wetland losses through the purchase of credits from an approved mitigation bank; (3) implement a SWPPP and associated BMPs; including the designation of staging areas for stockpiling of construction materials, portable equipment, vehicles, and supplies and (4) appoint onsight biologists to provide worker environmental awareness training to contractors and to monitor, report, and remove and transport special-status species if necessary or suspend construction activities until special-status species leave the project on their own. Concurrent implementation of these conservation measures would adequately avoid, minimize, and mitigate adverse effects on the special-status fish, wildlife and plant species discussed in this document.

f. Proposed Disposal Site Determinations

(1) Mixing Zone Size Determination

Not applicable.

(2) Determination of Compliance with Applicable Water Quality Standards

Water quality could be affected within the actual construction area and upstream and downstream of the work area. Construction activities such as rock placement, clearing and grubbing, and slope flattening, have the potential to temporarily degrade water quality through the direct release of soil and construction materials into water bodies or the indirect release of contaminants into water bodies through runoff.

The ARCF study is located within the jurisdiction of the Central Valley RWQCB, within the greater Sacramento Valley watershed. The preparation and adoption of water quality control plans, or Basin Plans, and statewide plans, is the responsibility of the SWRCB. State law requires that Basin Plans conform to the policies set forth in the California Water Code beginning with Section 13000 and any State policy for water quality control. These plans are required by the California Water Code (Section 13240) and supported by the Federal CWA. Section 303 of the CWA requires states to adopt water quality standards which "consist of the designated uses of the navigable waters involved and the water

quality criteria for such waters based upon such uses." According to Section 13050 of the California Water Code, Basin Plans consist of a designation or establishment for the waters within a specified area of beneficial uses to be protected and water quality objectives to protect those uses. Adherence to Basin Plan water quality objectives protects continued beneficial uses of water bodies. Because beneficial uses, together with their corresponding water quality objectives, can be defined per Federal regulations as water quality standards, the Basin Plans are regulatory references for meeting the State and Federal requirements for water quality control (40 CFR 131.20). The potential effects of the proposed project on water quality have been evaluated and are discussed in Section 3.5 of the ARCF EIS/EIR. Compliance with the California Water Code will be accomplished by obtaining certifications from the Central Valley RWQCB prior to construction and 404 review internally by the Corps.

(3) Potential Effects on Human Use Characteristics

a) Municipal and Private Water Supplies

The Sacramento River waterways historically were used as places to dispose of contaminants. In recent decades, treatment for municipal wastewater, industrial wastewater, and management of urban stormwater runoff have increased and improved greatly. Industries and municipalities now provide at least secondary treatment of wastewater. The American River originates in the high Sierra Nevada just west of Lake Tahoe, in the Tahoe and El Dorado National Forests. Its three main forks – the South, Middle, and North – flow through the Sierra foothills and converge east of Sacramento. The waters of the American River provide recreation, municipal power, and irrigation for the northern California area. The fill material would not violate Environmental Protection Agency or State water quality standards or violate the primary drinking water standards of the Safe Drinking Water Act (42 USC 300f-300j). Project design, compliance with State water quality thresholds and standard construction and erosion practices would preclude the introduction of substances into surrounding waters. Materials removed for disposal off-site would be disposed of in an appropriate landfill or other upland area.

b) Recreation and Commercial Fisheries

Under Alternative 1, there would be temporary closure of recreation facilities in the American River Parkway during construction, including the bike trails, walking trails, and boat launches. Alternative 2 would affect the same facilities as Alternative 1, but the possible closure of the Sacramento Bypass during hunting season. Notification and coordination with recreation users and bike groups would be arranged. Flaggers, signage, detours, and fencing would be present to notify and control recreation access and traffic around construction sites.

Alternative 1 would cause indirect effects to fish habitat from the removal of vegetation from the levee slopes. Direct effects from the placement of rock at a bank protection sites would cause an increase in turbidity. The same effects for Alternative 1 apply for Alternative 2, with the addition of widening the Sacramento Bypass, which would create a floodplain that could provide a benefit to fish species. For Alternatives 1 and 2, a vegetation variance would allow waterside vegetation to remain on

the lower one-third of the waterside slope along the Sacramento River. Bank protection sites and launchable rock trenches would be revegetated following construction. BMPs would be implemented to address turbidity.

c) Water-related recreation

Recreational boating is one of the primary uses of the American River. Boat access is located at Discovery Park on both the Sacramento and American River side of the park. Boat launches within the Parkway are located at Howe Avenue, Watt Avenue, and Gristmill Park. The river can become very shallow between Sunrise and Howe Avenue when releases from Folsom Dam are reduced, making motorized boating impracticable. Rafting on this stretch of the river is very common during summer months with the highest use on the weekends and holidays.

Under Alternative 1, recreational resources that could potentially be affected by construction of the erosion protection measures include Paradise Beach, the Campus Commons Golf Course, the Guy West Bridge, and the boat launches at Howe Avenue, Watt Avenue, and Gristmill Park. Construction will also occur during the summer months when the Parkway recreation activities are at the peak. There would be short-term term significant effects along the Sacramento River reach of the project, however, there would be no long-term effects because the area would be returned to the pre-construction conditions once completed. The timing of construction cannot be mitigated as it is unsafe to perform construction activities in the floodway during the flood season.

Effects to recreation from the construction of levee improvements under Alternative 2 would be consistent with those analyzed for Alternative 1 with the addition of effects resulting from construction of levee improvements associated with the Sacramento Weir and Bypass widening. Impacts to water-related recreation are the same for both Alternatives.

If any access point needs to be closed during construction, notices will be posted providing alternative access routes. Any recreation facilities affected by the project would be replaced in-kind within the existing area and no long-term impacts are anticipated.

d) Aesthetics

Alternatives 1 and 2 would result in vegetation loss and construction activities would disrupt the existing visual conditions in the Parkway and along the Sacramento River. Trees would be planted after construction is completed on planting berms and on top of launchable rock trenches; however, there would still be a temporal loss of vegetation. Disturbed areas would be reseeded with native grasses.

e) Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves

Many parks are located within the American River Parkway portion of the study. Following is a description of the parks and their activities.

Discovery Park. Located just north of downtown Sacramento at the confluence of the American River and the Sacramento River, this 302-acre park is a popular site for rafters and waders. Discovery Park is the trailhead for the 32-mile long Jedediah Smith Memorial Trail. The park also features a boat launch. Discovery Park was designed to flood and take pressure off American River levees during high water events. For safety reasons, the park closes when water flows into the public areas and remains closed until the water subsides.

Sutter's Landing Regional Park. Nestled along the banks of the American River about a mile northeast of downtown Sacramento, this 172-acre park currently offers a wide variety of recreational opportunities including a covered skateboard park, a dog park, picnic areas, basketball and bocce ball courts, as well as access to trails along the American River and a boat launch for kayaks, canoes, and other non-motorized boats. Visitors can also see a diversity of wildlife at this site including river otters, beavers, jackrabbits, cottontails, coyotes, raccoons, gopher snakes, fence lizards, skunks, ground squirrels, voles, and an occasional sea lion, as well as a wide variety of bird species ranging from shorebirds and waterfowl to raptors making it an ideal location for nature watching as well as birding. Other popular activities at this location include walking, jogging, and biking.

Paradise Beach. Just off of U.S. 50 at Howe Avenue, Paradise Beach offers a sandy beach area and is a popular spot for swimming.

Campus Commons Golf Course. Built in 1972, the 1,699 yard Campus Commons Golf Course is a public nine hole executive course located just north of California State University Sacramento, along the American River.

Guy West Bridge. The Guy West Bridge is a pedestrian-only suspension bridge crossing the historic Lower American River. It is modeled after the famed Golden Gate Bridge in San Francisco, but spans only 600 feet compared to the Golden Gate's 6,450 feet. The bridge was constructed to tie the California State University campus to a business and residential community on the north side of the American River.

Howe Avenue. Located down river from California State University, Sacramento, this car-top launch site allows small boats and rafts to be launched into the American River. Because of the swift rapids, this site is not conducive to swimming and wading.

Waterton and Save the American River Association. Just off of U.S. 50 at Watt Avenue, Waterton Access is a small site providing access along the river. The area is inhabited by deer and jackrabbits, so it is ideal for nature watching. The nearby Save the American River Association Access offers similar opportunity.

Watt Avenue. Just off Watt Avenue is an American River access point popular as a take-out spot for rafters, canoeists, and kayakers. Fishing is also popular here because of the range of shallow and deep water.

Gristmill Park. Located off Mira Del Rio Drive and Folsom Boulevard in Rancho Cordova, Gristmill Park is a popular place for fishing, bird watching, and nature watching/photography. The area also has some nice walking paths popular with the locals that wind through oak woodlands along the southern bank of the river in either direction from the parking area. In addition to the usual assortment of birds in these woodlands such as woodpeckers, Northern flickers, and red-shouldered hawks, it is not unusual to spot deer and coyote here as well. Due to the calmness of the river at this location, it is a popular launch spot for kayaking and canoeing.

William Pond Recreation Area. Located off Arden Way, the William Pond Recreation Area is one of the most well-established and popular parks along the river. Named in honor of the first director of County Parks, the park is handicap-friendly and offers a man-made fishing pond with a specialized fishing pier and ramp and paved walking trails that gently slope around the park.

River Bend Park (formerly Goethe Park). River Bend Park, formerly C.M. Goethe Park, is one of Sacramento's oldest county parks. It is located at U.S. 50 and Bradshaw Road and offers many recreation facilities. Horse and hiking trails wind through the park for plenty of wildlife viewing. This facility also has large group picnic sites often used for community events. River Bend Park is the endpoint for many recreational rafters on the American River.

Soil Born Farms. Located on the American River in Rancho Cordova (40 acres) and in Sacramento on Hurley Way (1.5 acres), Soil Born Farms organically grows a wide variety of fruits and vegetables linked to the seasons and temperament of the Sacramento region. All produce is harvested within a day of distribution to local restaurants, famers markets, and at their own farm stand at the American River ranch location from May to November. This nonprofit farm is actively involved in fostering organic farming through their farm apprentice program and youth education. All water used in irrigation comes from the American River and no synthetic pesticides or fertilizers are used.

Miller Park. Adjacent to the Sacramento Marina, off Harborview Drive from Front Street, this 57 acre city park is right on the Sacramento River. The park includes picnic areas, boat trailer parking, and a boat ramp and dock. There is also a store called Rat's Snack Shop.

Garcia Bend Park. Located between Pocket Road and the Sacramento River, this 19-acre community park is a popular place for recreation providing soccer fields, lighted tennis courts, play areas, picnic areas, restrooms, and a public boat ramp providing access to the Sacramento River.

The Riverfront Promenade. A new addition to Sacramento's riverfront, a couple blocks were opened in 2001. It is located just downstream of Old Sacramento and is still in the early stages of development. When complete, the promenade will be a mile long walking and cycling path that connects Old Sacramento to Miller Park.

For Alternative 1, construction of erosion protection measures is expected to take up to 10 years, with construction occurring in multiple locations within the Parkway at the same time. While this would not be a permanent long-term affect, 10 years of linear construction would be considered a significant effect to recreation activities because it would reduce the quality of existing recreation activities. Portions of the road on top of the levee would be closed to pedestrian access during the construction period. Additionally, construction of the launchable rock trench would disturb several miles of bike trails as well as access to public parks and boat launches within or adjacent to the Parkway. Such closures and disturbances would result in non-compliance with the American River Parkway Plan which states that flood control berms, levees and other facilities should be, to the extent consistent with proper operation and maintenance of these facilities, open to the public for approved uses, such as hiking, biking and other recreational activities.

These closures and disturbances would also result in non-compliance with the Wild and Scenic Rivers Act which states that "certain selected river of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations" Recreational resources that could potentially be affected by construction of the erosion protection measures include Paradise Beach, the Campus Commons Golf Course, the Guy West Bridge, and the boat launches at Howe Avenue, Watt Avenue, and Gristmill Park.

Effects to recreation from the construction of levee improvements under Alternative 2 would be consistent with those analyzed for Alternative 1 with the addition of effects resulting from construction of levee improvements associated with the Sacramento Weir and Bypass widening. Construction of levee improvements associated with the Sacramento Weir and Bypass widening would have possible short-term effects on recreational use. During construction, certain areas would be closed to the public while other areas might be used as haul routes or borrow/disposal sites. Activities such as bird watching, walking, running, and jogging along the Sacramento Bypass levee crown and nearby roads would be restricted. Construction activities could potentially overlap with hunting season in the Sacramento Bypass Wildlife Area, which occurs from September 1 through January 31, restricting hunting activities for a limited period of time. In addition, there may be temporary effects to the Yolo Shortline Railroad. Construction activities would have a significant effect on the Yolo Shortline Railroad as portions of the railway may have to be shut down or relocated during construction activities.

To ensure public safety, flaggers, warning signs, and signs restricting access would be posted before and during construction, as necessary. In the event that bike trails would be disrupted, detours would be provided. Detour routes would be clearly marked, and fences would be erected in order to prevent access to the project area. In areas where recreational traffic intersects with construction vehicles, traffic control will be utilized in order to maintain public safety. The public will have continued access to the Parkway and recreation facilities during construction, but bike and running trail users would likely be required to detour onto public roads or alternative trails. If any access point needs to be closed during construction, notices will be posted providing alternative access routes.

These mitigation measures will reduce the effects on recreation; however, impacts would still be significant because of the duration of construction and the inability to provide similar quality recreation during construction. Any recreation facilities affected by the project would be replaced in-kind within the existing area and no long-term impacts are anticipated.

g. Determination of Cumulative Effects on the Aquatic Ecosystem

Effects of the proposed action include reductions in nearshore aquatic and riparian habitats that are used by aquatic and terrestrial species. Placement of riprap on earthen banks alters natural fluvial processes that sustain high-value nearshore and floodplain habitats in alluvial river systems.

Levee maintenance activities by state agencies and local reclamation districts are likely to continue, although any effects on listed species will be addressed through Section 10 of the ESA. Ongoing non-federal activities that effect listed salmonids, Green Sturgeon, Delta Smelt, valley elderberry longhorn beetle, giant garter snake and their habitat, will likely continue in the short- term, at intensities similar to those of recent years. However, some activities associated with the State's proposed Central Valley Flood Protection Plan or state or local efforts to implement the ETL could result in increased effects on listed species. Potential cumulative effects on fish may include any continuing or future non-federal diversions of water that may entrain adult or larval fish or that may incrementally decrease outflows, thus changing the position of habitat for these species.

Potential cumulative effects on all species discussed above could include: wave action in the water channel caused by boats that may degrade riparian and wetland habitat and erode banks; dumping of domestic and industrial garbage; land uses that result in increased discharges of pesticides, herbicides, oil, and other contaminants; and conversion of riparian areas for urban development. In addition, routine vegetation clearing and mowing associated with agricultural practices may affect or remove habitat for the valley elderberry longhorn beetle and giant garter snake.

h. Determination of Secondary Effects on the Aquatic Ecosystem

The placement of rock would not only reduce the risk of erosion, but would also anchor remaining trees in place and reduce the potential for trees falling over during a high flow event. The understory, which provides habitat for small rodents, ground nesting birds and waterfowl, and various reptiles, would be removed in order to provide a clean surface to place the rock. Because the riprap is a hard surface it would not support the growth of large amounts of vegetation. In areas with a soil trench or soil placed over rock on the lower portion of the slope vegetation would be planted or allowed to establish naturally. The riprap would also provide basking areas for some small reptiles such as snakes and lizards. Because the riparian corridor and shaded river aquatic habitat left in place would still provide value to fish and wildlife species, and mitigation would be implemented for trees that were removed, impacts are consider less than significant.

Risk exists for unintentional placement of dredge and/or fill material to be conducted outside of the proposed project area. Unintentional placement could result in additional adverse impacts to water quality, erosion and accretion patterns, aquatic and other wildlife habitat, recreation, aesthetics and air quality. In order to reduce the risk of such impacts, contract specifications would require the contractor to mark the project boundaries, and that the contractor install erosion control (i.e. silt fencing, silt curtains) where possible within any standing waters.

III. Findings of Compliance or Non-Compliance with the Restrictions on Discharge

a. Adaptation of the Section 404(b)(1) Guidelines to this Evaluation

No significant adaptations of the guidelines were made relative to this evaluation.

b. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site

A practicable alternative to the proposed bank protection sites is the launchable rock trench measure, which was described in Section I(h) above. This measure would involve digging a rock trench in the berm at the waterside toe of the levee and filling it with rock. The rock would be covered with soil, and as the berm slowly erodes away during a high water event, the rock would “launch” and cover the bank to form a barrier to prevent further erosion. While this measure would minimize impacts associated with the placement of fill in waters of the U.S., it would have significant impacts to vegetation, wildlife, and recreation during construction. It is anticipated that this measure will be used in some locations on the American and Sacramento Rivers where bank protection is not practicable, however those locations have not been designed yet, and bank protection is the less environmentally damaging measure.

Additionally, in some locations where the river flow velocity is low, it may be practicable to use a biotechnical measure rather than bank protection or launchable trenches to provide erosion protection. This measure would involve using biomaterials such as fallen trees to protect the banks from erosion. This would be the least environmentally damaging measure, however it is not practicable for the majority of the river because currents are too strong. As a result there are only minimal locations where this measure could be feasibly implemented.

Because of the significant effects associated with the launchable rock trench measure, and the feasibility of the biotechnical measures, the bank protection measure is the least environmentally damaging practicable alternative.

c. Compliance with Applicable State Water Quality Standards

The proposed project would implement BMPs to ensure that it does not violate State water quality standards identified in the Central Valley Basin Plan (CVRWQCB 1998).

d. Compliance with Applicable Toxic Effluent Standard or Prohibition Under Section 307 of the Clean Water Act

The discharges of fill materials will not cause or contribute to, after consideration of disposal site dilution and dispersion, violation of any applicable State water quality standards for waters. The discharge operations will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

e. Compliance with Endangered Species Act of 1973

The placement of fill materials in the project area(s) will not jeopardize the continued existence of any species listed as threatened or endangered or result in the likelihood of destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973.

f. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972

Not applicable.

g. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem

Appropriate and practicable steps to minimize potential adverse effects of discharge and fill on the aquatic ecosystem include: placing fill material only where it is needed for the proposed project and confining it to the smallest practicable area. The areas disturbed by construction would be returned as close as possible to pre-project conditions when practicable.

On the basis of the guidelines, the proposed project is specified as complying with the inclusion of appropriate and practical conditions to minimize pollution or adverse effect on the aquatic ecosystem.