

4.2 HYDROLOGY, FLOODPLAINS, AND WATER QUALITY

Information contained in this section is based on the SR-22 West Orange County Connection *Floodplain Evaluation Report* (December, 2000) and the *Floodplain Evaluation Report Reduced Build Alternative Addendum* (December, 2000). For a more detailed discussion, these documents are available at Caltrans and OCTA under a separate cover.

4.2.1 Surface Water

A. NO BUILD ALTERNATIVE

The No Build Alternative would not include construction other than that addressed in previous environmental documents for approved projects. No new impacts to surface water availability, use, or quality would occur.

B. TSM/EXPANDED BUS SERVICE ALTERNATIVE

The TSM/Expanded Bus Service Alternative would include operational improvements and would not include any major capital improvements to SR-22. It would not result in substantial impacts to surface water availability, use, or quality.

C. FULL BUILD ALTERNATIVE

Use. The three major surface water resources in the study area are the Santa Ana River, San Gabriel River, and Santiago Creek. Los Alamitos Channel is a smaller waterway adjacent to the San Gabriel River that collects runoff from the area and has wetlands. An increase in runoff from the roadway due to an increase in paved area for the Full Build Alternative may minimally affect wetlands near the Los Alamitos Channel. For further information on wetlands refer to Section 4.4, Wetlands, of this document. The San Gabriel River is completely channelized and concrete-lined through the study area and only acts as a transport for water to the Pacific Ocean. It is physically separated from the Full Build Alternative by Los Alamitos Channel.

The beneficial uses for Santiago Creek and the Santa Ana River within the study area include municipal and domestic supply, non-contact water recreation, and groundwater recharge. Because the Full Build Alternative would increase the amount of paved surface area by approximately 24 hectares (60 acres), an increased amount of runoff may enter in the Santa Ana River. This incrementally higher volume of runoff would minimally affect the water in the river that is used for groundwater recharge (see Section 4.2-2).

Quality. Runoff from the roadway would be the most likely source of contamination to surface waters. The most common contaminants in highway runoff are heavy metals, inorganic salts, aromatic hydrocarbons, and suspended solids that accumulate on the road surface as a result of regular highway operation and maintenance activities. Ordinary operations and the wear and tear of our vehicles result in the dropping of oil, grease, rust, hydrocarbons, rubber particles, and other solid materials on the highway surface. These materials are washed off the highway during rain events. Receiving surface waters are susceptible to contamination from these sources (FHWA, 1999). The surface area of pavement on a roadway is one determinant of the amount of runoff. The Full Build Alternative would add approximately 24 hectares (60 acres) of new pavement to the roadway.

Receiving waters for this runoff would be the drainage channels and surface waters of the study area. The majority of runoff flows into the lined channels. The only surface waters that support any vegetation within or downstream from the study area are Los Alamitos Channel, Santa Ana River, and Santiago Creek. These areas currently receive highway and roadway runoff, so existing vegetation is adapted to the polluted conditions. The incremental increase in contaminants would not be expected to result in the loss of this adapted vegetation.

Only a small portion of the runoff flows into the Santa Ana River. The quality of this surface water is important because of its use for groundwater recharge. Most of the recharge from the Santa Ana River occurs north (upstream) of the proposed improvements. The small increase in runoff volume that flows into the Santa Ana River in areas used for recharge would minimally impact groundwater, which in turn may incrementally affect the groundwater's beneficial uses (see Section 4.2.2).

D. REDUCED BUILD ALTERNATIVE

Use. The two major surface water resources in the Reduced Build Alternative are the Santa Ana River and the San Gabriel River. Los Alamitos Channel is a smaller waterway adjacent to the San Gabriel River that collects runoff from the area and has wetlands. An increase in runoff from the roadway due to an increase in paved area for the Full Build Alternative may minimally affect wetlands near the Los Alamitos Channel. For further information on wetlands refer to Section 4.4, Wetlands, of this document. The San Gabriel River is completely lined through the study area and only acts as a transport for water to the Pacific Ocean. It is physically separated from the Reduced Build Alternative by Los Alamitos Channel.

The beneficial uses for the Santa Ana River within the study area include municipal and domestic supply, non-contact water recreation, and groundwater recharge. Because the Reduced Build Alternative would increase the amount of paved surface area by approximately 10 hectares (25 acres), an increased amount of runoff may enter in the Santa Ana River. This incrementally higher volume of runoff would minimally affect the water in the river that is used for groundwater recharge (see Section 4.2-2).

Quality. Runoff from the roadway would be the most likely source of contamination to surface waters. The most common contaminants in highway runoff are heavy metals, inorganic salts, aromatic hydrocarbons, and suspended solids that accumulate on the road surface as a result of regular highway operation and maintenance activities. Ordinary operations and the wear and tear of vehicles result in the dropping of oil, grease, rust, hydrocarbons, rubber particles, and other solid materials on the highway surface. These materials are washed off the highway during rain events. Receiving surface waters are susceptible to contamination from these sources (FHWA, 1999). The surface area of pavement on a roadway is one determinant of the amount of runoff. The Reduced Build Alternative would add approximately 10 hectares (25 acres) of pavement to the roadway.

Receiving waters for this run-off would be the drainage channels and surface waters of the study area. The majority of runoff flows into the lined channels. The only surface waters that support any vegetation within or downstream from the study area for the Reduced Build Alternative are Los Alamitos Channel and the Santa Ana River. These areas currently receive highway and roadway runoff, so existing vegetation is adapted to the polluted conditions. The incremental increase in contaminants would not be expected to result in the loss of this adapted vegetation.

Only a small portion of the runoff flows into the Santa Ana River. The quality of this surface water is important because of its use for groundwater recharge. Most of the recharge from the Santa Ana River occurs north (upstream) of the proposed improvements. The small increase in runoff volume that flows into the Santa Ana River in areas used for groundwater recharge would minimally impact groundwater, which in turn may incrementally affect the groundwater's beneficial uses (see Section 4.2.2).

Thresholds of Significance for CEQA:

- Potential for new/enlarged structures which may result in change in floodplain elevation

A. NO BUILD ALTERNATIVE

No new impacts to surface water availability, use, or quality would occur.

B. TSM/EXPANDED BUS SERVICE ALTERNATIVE

There would be no impacts to surface water availability, use, or quality.

C. FULL BUILD ALTERNATIVE

Use. As previously discussed, the Santa Ana River, San Gabriel River, and Santiago Creek are the major surface water resources in the study area. An increase in runoff from the roadway due to an increase in paved area for the Full Build Alternative would negligibly affect wetlands near the Los Alamitos Channel. There would be a slight increase in runoff from the paved roadway. Refer to Table 4.2-1.

Quality. Runoff from the roadway would be the most likely source of contamination to surface waters. These include common contaminants such as heavy metals, inorganic salts, aromatic hydrocarbons, and suspended solids that accumulate on the road surface resulting from highway operation and maintenance activities. The Full Build Alternative would add approximately 24 hectares (60 acres) of new pavement to the roadway.

The only surface waters that support any vegetation within or downstream from the study area are Los Alamitos Channel, Santa Ana River, and Santiago Creek. These areas currently receive highway and roadway runoff, so existing vegetation is adapted to the polluted conditions. The incremental increase in contaminants would not be expected to result in the loss of this adapted vegetation resulting in less than significant impacts.

Only a small portion of the runoff flows into the Santa Ana River. The quality of this surface water is important because of its use for groundwater recharge. The small increase in runoff volume that flows into the Santa Ana River in areas used for recharge would have less than significant impact to groundwater, which in turn may incrementally affect the groundwater's beneficial uses (see Section 4.2.2).

D. REDUCED BUILD ALTERNATIVE

Use. The two major surface water resources in the Reduced Build Alternative are the Santa Ana River and the San Gabriel River. Los Alamitos Channel is a smaller waterway adjacent to the San Gabriel River that collects runoff from the area and has wetlands. The San Gabriel River is completely lined through the study area and only acts as a transport for water to the Pacific Ocean. It is physically separated from the Reduced Build Alternative by Los Alamitos Channel.

Since the Reduced Build Alternative would increase the amount of paved surface area by approximately 10 hectares (25 acres), an increase in the amount of runoff may enter in the Santa Ana River. The incrementally higher volume of runoff would be a slight increase in runoff from the paved roadway. (see Section 4.2-2).

Quality. Runoff from the roadway would be the most likely source of contamination to surface waters. Contaminants such as heavy metals and inorganic salts are washed off the highway during rain events. The surface area of pavement on a roadway is one determinant of the amount of runoff. The Reduced Build Alternative would add approximately 10 hectares (25 acres) of pavement to the roadway.

Receiving waters for this run-off would be the drainage channels and surface waters of the study area. The majority of runoff flows into the lined channels. The only surface waters that support

any vegetation within or downstream from the study area for the Reduced Build Alternative are Los Alamitos Channel and the Santa Ana River. These areas currently receive highway and roadway runoff, so existing vegetation is adapted to the polluted conditions. The incremental increase in contaminants would not be expected to result in the loss of this adapted vegetation.

Only a small portion of the runoff flows into the Santa Ana River. The small increase in runoff volume that flows into the Santa Ana River in areas used for groundwater recharge would result in less than significant impact to groundwater, which in turn may incrementally affect the groundwater's beneficial uses (see Section 4.2.2).

4.2.2 Groundwater

A. NO BUILD ALTERNATIVE

The No Build Alternative would not include construction other than that addressed in previous environmental documents for approved projects. No new impacts to groundwater availability, use, or quality would occur.

B. TSM/EXPANDED BUS SERVICE ALTERNATIVE

The TSM/Expanded Bus Service Alternative would include operational improvements to bus service and would not include any major capital improvements to SR-22. Impacts to the availability, use, or quality of groundwater would be minimal.

C. FULL BUILD ALTERNATIVE

Availability. The Orange County groundwater basin is split into two zones, the Pressure Area and the Forebay. Groundwater recharge is primarily possible in the Forebay. The Full Build Alternative would add approximately 24 hectares (60 acres) of pavement to the roadway. About a third of the study area, from Harbor Boulevard east, is located above the Forebay groundwater recharge area. Because additional surface areas would be covered with impermeable surfaces – approximately 10 hectares (25 acres) – there would be a slight decrease in groundwater recharge. The majority of groundwater recharge occurs within the Santa Ana River, however. The Full Build Alternative would include widening of the portion of the roadway that passes over the Santa Ana River. The availability of water for groundwater recharge in the river would be unaffected by the Full Build Alternative, because areas above the river would drain into it.

Use. Groundwater in the area is used for municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply. Improvements included in the Full Build Alternative would not affect any groundwater wells. Any reduction in groundwater quantity, as noted below, would be minimal. Therefore, current uses of groundwater in the area would not be affected.

Quality. OCWD regulates groundwater quality, taking regular samples as a preventative measure to ensure consistently high-quality groundwater. Runoff from the roadway may result in increased contamination entering the groundwater from percolation of surface waters. Receiving groundwater is susceptible to the types of contamination described in Section 4.2.1. Contamination of groundwater tends to occur gradually because contaminants percolate downward through the soil at slow rates, where the ground serves as a filter (FHWA, 1999). The Full Build Alternative may incrementally add to highway runoff due to the increase in surface area of paved areas. Highway runoff is conveyed through a system of drainage pipes and flood control channels.

D. REDUCED BUILD ALTERNATIVE

Availability. The groundwater basin is split into two zones, the Pressure Area and the Forebay. Groundwater recharge is primarily possible in the Forebay. The Reduced Build Alternative would add approximately 8 hectares (20 acres) of pavement to the roadway. About a third of the study area, from Harbor Boulevard east, is located above the Forebay groundwater recharge area. Because additional surface areas would be covered with impermeable surfaces – approximately three hectares (eight acres) – there would be a slight decrease in groundwater recharge. The majority of groundwater recharge occurs within the Santa Ana River, however. The Reduced Build Alternative would include widening of the portion of the roadway that passes over the Santa Ana River. The availability of water for groundwater recharge in the river would be unaffected by the Reduced Build Alternative because areas above the river would drain into it.

Use. Groundwater in the area is used for municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply. Improvements included in the Reduced Build Alternative would not affect any groundwater wells. Any reduction in groundwater quantity, as noted below, would be minimal. Therefore, current uses of groundwater in the area should not be affected.

Quality. OCWD regulates groundwater quality, taking regular samples as a preventative measure to ensure consistently high-quality groundwater. Runoff from the roadway may result in increased contamination entering the groundwater from percolation of surface waters. Receiving groundwater is susceptible to the types of contamination described in Section 4.2.1. Contamination of groundwater tends to occur gradually because contaminants percolate downward through the soil at slow rates, where the ground serves as a filter (FHWA, 2000). The Reduced Build Alternative may incrementally add to highway runoff due to the increase in surface area of paved areas. Highway runoff is conveyed through a system of drainage pipes and flood control channels.

Thresholds of Significance for CEQA:

- Potential on groundwater availability, use, or quality

A. NO BUILD ALTERNATIVE

The No Build Alternative would have no impacts to groundwater availability, use, or quality.

B. TSM/EXPANDED BUS SERVICE ALTERNATIVE

The TSM/Expanded Bus Service Alternative would result in no impacts to the availability, use, or quality of groundwater.

C. FULL BUILD ALTERNATIVE

Availability. The Full Build Alternative would add approximately 24 hectares (60 acres) of pavement to the roadway. Approximately one-third of the study area, from Harbor Boulevard east, is located above the Forebay groundwater recharge area. Since additional surface areas would be covered with impermeable surfaces –approximately 10 hectares (25 acres) – there would be a slight decrease in groundwater recharge. This alternative would include widening of the portion of the roadway that passes over the Santa Ana River. The availability of water for groundwater recharge in the river would be negligibly by the Full Build Alternative since areas above the river would drain into it.

Use. Groundwater in the area is used for municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply. Improvements included in the Full Build Alternative would not affect any groundwater wells. Any reduction in groundwater quantity, as

noted below, would result in less than significant impact. Therefore, current uses of groundwater in the area would be negligibly impacted.

Quality. Runoff from the roadway may result in increased contamination entering the groundwater from percolation of surface waters. Receiving groundwater is susceptible to the types of contamination described in Section 4.2.1. The Full Build Alternative may incrementally add to highway runoff due to the increase in surface area of paved areas. Highway runoff is conveyed through a system of drainage pipes and flood control channels. This would result in less than significant impacts to the quality of water.

D. REDUCED BUILD ALTERNATIVE

The Reduced Build Alternative would add approximately 8 hectares (20 acres) of pavement to the roadway. About one-third of the study area, from Harbor Boulevard east, is located above the Forebay groundwater recharge area. Since additional surface areas would be covered with impermeable surfaces – approximately three hectares (eight acres) would be a slight decrease in groundwater recharge. The majority of groundwater recharge occurs within the Santa Ana River. The Reduced Build Alternative would include widening of the portion of the roadway that passes over the Santa Ana River. The availability of water for groundwater recharge in the river would be negligibly affected by the Reduced Build Alternative since areas above the river would drain into it. This would result in less than significant impact to the availability of water.

Use. Improvements included in the Reduced Build Alternative would not affect any groundwater wells. Any reduction in groundwater quantity, as noted below, would result in less than significant impacts. Therefore, current uses of groundwater in the area would be minimally affected.

Quality. The Reduced Build Alternative may incrementally add to highway runoff due to the increase in surface area of paved areas. Highway runoff is conveyed through a system of drainage pipes and flood control channels. The incremental increase in runoff due to increase in the surface area would result in less than significant impacts.

4.2.3 Floodplain

A. NO BUILD ALTERNATIVE

The No Build Alternative would not include construction other than that addressed in previous environmental documents for approved projects. No new impacts to floodplain elevations would occur. No new risks associated with flooding would occur.

B. TSM/EXPANDED BUS SERVICE ALTERNATIVE

The TSM/Expanded Bus Service Alternative would include operational improvements to bus service and would not include any major capital improvements to SR-22. No new impacts to floodplain elevations are expected. New risks associated with flooding are expected to be negligible.

C. FULL BUILD ALTERNATIVE

Changes in Floodplain Elevations. There are nine waterways within the study area that were studied for the Full Build Alternative. Table 4.2-1 describes the impacts for most of the waterways.

Santa Ana River. With the completion of seven of the nine segments of the Santa Ana River project starting from the Pacific Ocean to Imperial Highway plus the Seven Oaks Dam, the 100-year flood in the lower Santa Ana River is contained in the existing channel.

Although the bridge widening at the SR-22 crossing and the addition of bridges over the river (two north of the SR-22 crossing and one in the Pacific Electric right-of-way) would require additional piers to be placed in the river, the additional piers are not anticipated to impact the floodplain elevation of the river by more than the maximum allowable rise (0.3 meter) to avoid a finding of a significant floodplain impact. (No changes in floodplain limits are anticipated because the floodplain is now contained within the channel at this location.) By placing the new piers in the same alignment as the existing bridge piers, the hydraulic impacts to the river would be minimal. Mitigation requiring this result is provided in Section 4.2.4.

Changes in Floodplain Risks. The Full Build Alternative would not result in significant floodplain risks as defined by FEMA. It would not be a significant longitudinal encroachment. There would be no significant risks associated with the action. The action would not support probable incompatible floodplain development. The action would not be a significant floodplain encroachment. Non-routine measures would not be required to minimize floodplain impacts associated with the action. There would be no significant impacts on natural and beneficial floodplain values. Non-routine measures would not be required to restore and preserve the natural and beneficial floodplain values impacted by the action for the Full Build Alternative.

**Table 4.2-1
CHANGES IN FLOODPLAINS
FULL BUILD ALTERNATIVE**

Waterway	Impact
Los Alamitos Channel (C01)	Improvements are not anticipated to impact the flow or flood storage area of the channel. The toe of the widened highway embankment would be above the maximum flooding elevation. (See Section 4.4 regarding wetlands.)
Montecito Storm Channel (C01S03)	Improvements are not anticipated to impact the floodplain of the Montecito Storm Channel. The embankment would require a lengthening of the existing sized culvert under the embankment with minimal hydraulic impacts.
Bixby Storm Channel (C01S04)	Improvements are not anticipated to impact the floodplain of the channel. The 100-year flow of this segment of the storm channel is relatively small. The proposed relocation of the Seal Beach Boulevard northbound on-ramp in this area would require the relocation of the channel, replacement of the channel with a culvert, or construction of a retaining wall to maintain flow capacity, with no negative impact to the channel.
Federal Storm Channel (C01S06)	Improvements are not anticipated to impact the floodplain of the channel. The embankment would require a lengthening of the existing sized culvert under the embankment with minimal hydraulic impacts.
Bolsa Chica Channel (C02)	Improvements are not anticipated to impact the floodplain of the channel. The embankment would require a lengthening of the existing sized culvert under the embankment with minimal hydraulic impacts.
Anaheim-Barber City Channel (C03)	Improvements are not anticipated to impact the floodplain of the channel. The embankment or bridge widening would not require lengthening of the existing sized culvert that passes under both SR-22 and Knott Street/Goldenwest Boulevard.
East Garden Grove-Wintersburg Channel (C05)	Improvements are not anticipated to impact the floodplain of the channel. The embankment would require a lengthening of the existing sized culvert under the embankment with minimal hydraulic impacts.
Santiago Creek (E08)	Improvements at both the SR-22 and SR-55 crossing are not anticipated to impact the floodplain of the creek. Both bridge widenings would require additional piers to be placed in the creek. By placing the piers in the same alignment as the existing bridge piers, the hydraulic impacts to Santiago Creek should be minimal.

D. REDUCED BUILD ALTERNATIVE

Changes in Floodplain Elevations. There are nine waterways within the study area that were studied for the Reduced Build Alternative. Table 4.2-2 describes the impacts for most of the waterways.

Santa Ana River. With the completion of seven of the nine segments of the Santa Ana River project starting from the Pacific Ocean to Imperial Highway plus the Seven Oaks Dam, the 100-year flood in the lower Santa Ana River is contained in the existing channel.

Although the bridge widening at the SR-22 crossing and the addition of two bridges north of the SR-22 crossing would require additional piers to be placed in the river, the additional piers are not anticipated to impact the floodplain elevation by more than 0.3 meter (one foot), which is the maximum allowable rise to avoid a significant floodplain impact. (No changes in floodplain limits are anticipated because the floodplain is now contained within the channel at this location.

Changes in Floodplain Risks. The Reduced Build Alternative would not result in significant floodplain risks as defined by FEMA. It would not be a significant longitudinal encroachment. There would be minimal risks associated with the action. The action would not support probable incompatible floodplain development. The action would be minimal on floodplain encroachment. Non-routine measures would not be required to minimize floodplain impacts associated with the action. There would be minimal impacts on natural and beneficial floodplain values. Non-routine measures would not be required to restore and preserve the natural and beneficial floodplain values impacted by the action for the Reduced Build Alternative.

**Table 4.2-2
CHANGES IN FLOODPLAINS
REDUCED BUILD ALTERNATIVE**

Waterway	Impact
Los Alamitos Channel (C01)	Improvements are not anticipated to impact the flow or flood storage area of the channel. The toe of the widened highway embankment would be above the maximum flooding elevation.
Montecito Storm Channel (C01S03)	Improvements are not anticipated to impact the floodplain of the Montecito Storm Channel. The embankment would require a lengthening of the existing sized culvert under the embankment with minimal hydraulic impacts.
Bixby Storm Channel (C01S04)	Improvements are not anticipated to impact the floodplain of the channel. The 100-year flow of this segment of the storm channel is relatively small. The proposed relocation of the Seal Beach Boulevard northbound on-ramp in this area would require the relocation of the channel, replacement of the channel with a culvert, or construction of a retaining wall to maintain flow capacity, with no negative impact to the channel.
Federal Storm Channel (C01S06)	Improvements are not anticipated to impact the floodplain of the channel. The embankment would require a lengthening of the existing sized culvert under the embankment with minimal hydraulic impacts.
Bolsa Chica Channel (C02)	Improvements are not anticipated to impact the floodplain of the channel. The embankment would require a lengthening of the existing sized culvert under the embankment with minimal hydraulic impacts.
Anaheim-Barber City Channel (C03)	Improvements are not anticipated to impact the floodplain of the channel. The embankment or bridge widening would not require a lengthening of the existing sized culvert that passes under both SR-22 and Knott Street/Goldenwest Boulevard.
East Garden Grove-Wintersburg Channel (C05)	Improvements are not anticipated to impact the floodplain of the channel. The embankment would require a lengthening of the existing sized culvert under the embankment with minimal hydraulic impacts.

Thresholds of Significance for CEQA:

- Potential on new/enlarged structures that may result in change in floodplain elevation

A. NO BUILD ALTERNATIVE

The No Build Alternative would have no impacts to floodplain elevations or an increase in flooding.

B. TSM/EXPANDED BUS SERVICE ALTERNATIVE

No impacts to floodplain elevations would occur and new risks associated with flooding would not occur.

C. FULL BUILD ALTERNATIVE

Changes in Floodplain Elevations. There are nine waterways within the study area that were studied for the Full Build Alternative. See Table 4.2-1 for description of impacts to most of the waterways.

Santa Ana River. With the completion of seven of the nine segments of the Santa Ana River project starting from the Pacific Ocean to Imperial Highway plus the Seven Oaks Dam, the 100-year flood in the lower Santa Ana River is contained in the existing channel.

Although the bridge widening at the SR-22 crossing and the addition of bridges over the river (two north of the SR-22 crossing and one in the Pacific Electric right-of-way), would require additional piers to be placed in the river, they are not anticipated to impact the floodplain elevation of the river by more than 0.3 meter (one foot), which is the maximum allowable rise to avoid a finding of a significant floodplain impact. By placing the new piers in the same alignment as the existing bridge piers, the hydraulic impacts to the river would result in less than significant impacts.

D. REDUCED BUILD ALTERNATIVE

Changes in Floodplain Elevations. There are nine waterways within the study area that were studied for the Reduced Build Alternative. See Table 4.2-2 for description of impacts to most of the waterways.

Santa Ana River. With the completion of seven of the nine segments of the Santa Ana River project starting from the Pacific Ocean to Imperial Highway plus the Seven Oaks Dam, the 100-year flood in the lower Santa Ana River is contained in the existing channel.

Although the bridge widening at the SR-22 crossing and the addition of two bridges north of the SR-22 crossing would require additional piers to be placed in the river, the additional piers are not anticipated to impact the floodplain elevation by more than 0.3 meter (one foot), which is the maximum allowable rise to avoid a significant floodplain impact. (No changes in floodplain limits are anticipated because the floodplain is now contained within the channel at this location.

Changes in Floodplain Risks. The Reduced Build Alternative would result in less than significant floodplain impacts as defined by FEMA. There would be less than significant impacts on natural and beneficial floodplain values. Non-routine measures would not be required to restore and preserve the natural and beneficial floodplain values impacted by the action for the Reduced Build Alternative.

4.2.4 Mitigation

A. NO BUILD ALTERNATIVE

None proposed.

B. TSM/EXPANDED BUS SERVICE ALTERNATIVE

None proposed.

C. FULL BUILD ALTERNATIVE

See Section 4.4, Wetlands, of this document for erosion control mitigation.

HYD-FB-1: For all bridges and other structures to be constructed within 100-year floodplains, specific impacts to floodplain elevations will be analyzed at the design stage. Such structures will not be allowed to result in a 0.3-meter (one-foot) or greater impact in floodplain elevation. If analysis of the design indicates impacts equal or greater than this threshold, the designs will be revised to eliminate any flooding hazards.

HYD-FB-2: The National Pollutant Discharge Elimination System (NPDES) Permit requires Caltrans stormwater discharges to meet water quality standards through implementation of permanent and temporary (during construction) Best Management Practices (BMPs). The Contractor shall fully conform to the requirements of the Caltrans Statewide NPDES Storm Water Permit, Order No 99-06-DWQ, NPDES No. CAS000003, adopted by the State Water Resources Control Board on July 15, 1999. When applicable, the contractor shall also conform to the requirements of the General NPDES Permit for Construction Activities, Order No. 92-08-DWQ, NPDES No. CAS000002, and any subsequent General Permit in effect at the time of construction. These permits regulate stormwater and non-stormwater discharges associated with year-round construction activities.

D. REDUCED BUILD ALTERNATIVE

See Section 4.4, Wetlands, of this document for erosion control mitigation.

HYD-RB-1: For all bridges and other structures to be constructed within 100-year floodplains, specific impacts to floodplain elevations will be analyzed at the design stage. Such structures will not be allowed to result in a 0.3-meter (one-foot) or greater impact in floodplain elevation. If analysis of the design indicates impacts equal or greater than this threshold, the designs will be revised until the impact is reduced to a negligible amount.

HYD-RB-2: The National Pollutant Discharge Elimination System (NPDES) Permit requires Caltrans stormwater discharges to meet water quality standards through implementation of permanent and temporary (during construction) Best Management Practices (BMPs). The Contractor shall fully conform to the requirements of the Caltrans Statewide NPDES Storm Water Permit, Order No 99-06-DWQ, NPDES No. CAS000003, adopted by the State Water Resources Control Board on July 15, 1999. When applicable, the contractor shall also conform to the requirements of the General NPDES Permit for Construction Activities, Order No. 92-08-DWQ, NPDES No. CAS000002, and any subsequent General Permit in effect at the time of

construction. These permits regulate stormwater and non-stormwater discharges associated with year-round construction activities.

4.2.5 Residual Impacts After Mitigation

A. NO BUILD ALTERNATIVE

None.

B. TSM/EXPANDED BUS SERVICE ALTERNATIVE

None.

C. FULL BUILD ALTERNATIVE

Less than substantial.

D. REDUCED BUILD ALTERNATIVE

Less than substantial.

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