Appendix A

City of West Sacramento's Southport Sacramento River Corridor Recreation Program

A.1 Introduction

The City of West Sacramento (City) has identified an opportunity to provide local and regional residents with a unique riverfront recreation experience, similar to the American River Parkway located in Sacramento County, along the west shore of the Sacramento River in the Southport area of the city. This appendix describes the recreation enhancements planned by the City as part of the Southport Sacramento River Corridor Recreation Program (recreation program) for the area of Southport adjacent to the Sacramento River starting at the termination of the U.S. Army Corps of Engineers (USACE) Sacramento River Bank Protection Project (SRBPP) at River Mile 57.2R and continuing south 5.6 miles to the South Cross Levee.

The City would like to construct these recreation enhancements in conjunction with the levee improvements proposed under the Southport Sacramento River Early Implementation Project (Southport project); however, there is not sufficient funding at this time to construct a full recreation program as part of the Southport project. Consequently, only select elements from the recreation program are proposed for construction under the Southport project and are analyzed in the Southport project EIS/EIR.

Although the recreation program is not fully incorporated into the Southport project, the City is closely coordinating its plans for recreation enhancements in the area with the Southport project's environmental review process, and has developed a vision for recreation enhancements that could be constructed during or after completion of the Southport project. Because the levee improvement alternatives proposed under the Southport project vary greatly in regard to final levee, roadway, and shoreline configuration, and therefore would result in substantially different opportunities and constraints for recreation, the City has developed a separate recreation vision that is compatible with the proposed flood improvement actions for each of the four Southport project alternatives.

A.2 Recreation Program

The recreation program would help the City meet its recreation needs as identified in the City of West Sacramento *Parks Master Plan* (Attachment F.1) and the City of West Sacramento *Bicycle and Pedestrian Path Master Plan* (Attachment F.2), enable the City's population to more easily enjoy the resources provided by the Sacramento River, and improve safety conditions for bicyclists, pedestrians, and equestrians. The completed recreation program in the Southport project area would provide local and regional residents with a unique, riverfront recreation experience similar to the American River Parkway.

Key to the recreation enhancements proposed under the recreation programis enhancement of the recreation corridor along the Sacramento River. The stretch of the Sacramento River South Levee under consideration makes up a large portion of the Parks Master Plan's Recreation Corridor 1. Recreation corridors are proposed throughout the city and are intended to serve as recreation and

alternative transportation routes. South River Road, which runs along the top of the existing Sacramento River levee, is used by bicyclists, pedestrians, equestrians, fisherman, and others seeking open space values of the river, despite narrow traffic lanes and the absence of any bike lanes, sidewalks, trails, designated parking areas, or access locations. Recreation upgrades proposed for Recreation Corridor 1 would provide a much safer corridor for recreation and alternative transportation by constructing bike trails, pedestrian shoulders, and, where appropriate, multi-purpose trails and staging/parking areas.

As part of the recreation program, additional recreation features such as parking, picnic areas, developed water access, and interpretive kiosks are proposed to complement each Southport project alternative, where appropriate to the specific levee improvements. These elements are ranked by implementation priority as categorized below.

Linear Facilities

1. **Multi-Purpose Trails**. These include bike lanes on roadways and roads that serve dual functions as both recreation trails and levee patrol and/or maintenance access roads.
2. **Recreation-Only Trails**. Dedicated, recreation-only trails include Class I bike paths, paved Americans with Disabilities Act (ADA)–compliant trails, and equestrian trails.
3. **Low-Intensity Trail Amenities**. These elements would be built to enhance the trail experience: access controls, wayfinding/rules, seating, and interpretive signs/kiosks.

Active, Localized Facilities

4. **Moderate-Intensity Developed Facilities**. This category comprises items such as parking/staging areas, picnic areas, developed water access, viewing patios, and an adventure play area, fitness trail, and disc golf course.
5. **High-Intensity Developed Facilities**. This category includes a proposed boat ramp.

These recreation elements are described below, and a table is provided for each Southport project alternative noting which recreation elements are compatible with the proposed flood improvements at each segment (Table A-1, at end of this appendix). At this time, it is assumed that only the multi-purpose trails and some associated low-intensity trail amenities would be built as part of the Southport project. Construction of the remainder of these features will occur after initial construction of the Southport project levee improvements.

All amenities would be subject to environmental review, approval by Reclamation District (RD) 900 and Central Valley Flood Protection Board (CVFPB), and permits as required from the City, state, and Federal governments. The City would be responsible for all costs associated with maintenance and repair of recreational amenities, and RD 900 would have priority over all recreational use for flood-fighting and operations and maintenance (O&M) of the flood infrastructure.

A.2.2 Linear Facilities: Multi-Purpose Trails

A.2.2.1 Bike Trail/Operation and Maintenance Road

Each of the flood protection improvements proposed under the Southport project would require construction of O&M roads for inspection, flood-fighting, and vegetation maintenance. These roads would run the length of the Southport project area, along the alignment of the Parks Master Plan's

proposed Recreation Corridor 1. To minimize environmental disturbance and maximize cost-effectiveness, the City proposes combining Recreation Corridor 1 with the flood protection O&M roads by opening these corridors up to public use by bicyclists and pedestrians. Equestrian use of levee crown patrol roads is prohibited by state Title 23 regulation

These multi-purpose roads may be paved or surfaced with compacted aggregate base for all-weather use. If paved, the roads would be a Class I-equivalent bikeway at approximately 12 feet wide with 4-foot aggregate base shoulders on either side for pedestrian use. RD 900 use for flood-fighting and O&M would have priority over recreational use.

A.2.2.2 Bike Lanes

Under Alternatives 2 and 4 of the Southport project, Village Parkway would be constructed to the standard of a Rural Road. The Southport Design Guidelines define the dimensions of a Rural Road as a 24-foot-wide, paved, two-way road with 6-foot gravel shoulders on each side (City of West Sacramento 1996). However, the City proposes to provide 6-foot-wide paved bike lanes with 6-foot-wide gravel shoulders on each side of Village Parkway to increase safety for residents using the corridor for recreation and non-motorized transport purposes. Construction of this feature will be contingent upon city funding availability.

A.2.3 Linear Facilities: Recreation-Only Trails

A.2.3.1 Paved Bike Trail

Recreation-only bike trails are proposed in locations that are desirable from a recreation or non-motorized transport perspective, but where there are no levee maintenance corridors. These paved bike trails would be approximately 12 feet wide with a 4-foot-wide compacted aggregate base shoulder on either side of the trail for pedestrian use.

A.2.3.2 Paved Path

In some areas, a narrower, pedestrian-only trail would be the most appropriate trail option. Pedestrian-only trails would be paved and ADA-compliant, with a minimum width of 3 feet and a maximum width of 5 feet. In places where the path is less than 5 feet wide, passing areas would be constructed at least every 200 feet.

A.2.3.3 Equestrian Trail

Equestrian trails would be constructed as a component of Recreation Corridor 1 where appropriate conditions exist. The ground surface would be cleared for the equestrian trails at a minimum width of 4 feet. Because the top 30 feet of land surface in the Southport project area consists generally of silt and clay with some sand (Blackburn Consulting 2011), the trail surface may be stabilized with gravel.

A.2.4 Linear Facilities: Low-Intensity Trail Amenities

A.2.4.1 Access Controls

Removable access controls (bollards) would be installed at the entrance to all trails and as needed for authorized vehicle control.

A.2.4.2 Wayfinding/Directions/Rules

Permanent safety signs would be installed at select trail access points and at periodic intervals along the trails to inform users that the trail serves as a levee maintenance road and to instruct them to watch for patrolling vehicles. These signs also would inform users that portions of the trail and other recreation facilities are subject to flooding and that trail damage and related safety hazards could occur during the flooding season. Other signs would be installed as needed to inform users of necessary directions, rights-of-way, appropriate use, and safety.

A.2.4.3 Seating

Seating areas would be provided periodically along trails, where funding space permits. Seating areas would consist of benches and trash/recycling receptacles, and would be more desirable in areas with enticing characteristics like shade or a view.

A.2.4.4 Interpretive Signs/Kiosks

Interpretive signs or kiosks would be built in association with other recreation features to enhance the educational aspect of the recreation experience. These signs and/or kiosks would highlight the biological, geographic, historical, or community significance of the surrounding environment.

A.2.5 Active, Localized Facilities: Moderate-Intensity Developed Facilities

A.2.5.1 Parking/Staging Areas

Parking and staging areas would be a desirable addition to the Recreation Corridor 1 area, especially with the construction of additional recreational features. Current parking opportunities occur only on the shoulder of South River Road, or at the discretion of private marina facilities. Landowners have informed the City that some recreational users are trespassing on private property for parking and staging. One or more official parking areas would provide for safe, off-street parking and staging and reduce trespassing on private property. Parking/staging areas would be either paved or surfaced for all-weather use and may include trash/recycling receptacles, rules/wayfinding signs, seating, and restrooms where hookups to water and sanitary sewer are available.

The City has identified three locations at which new parking areas would make sense from a recreational use perspective. These locations are in the vicinity of the intersection of Gregory and South River Road, landward of the intersection of Davis Road and the Sacramento River levee, and landward of the intersection of Linden Road and the Sacramento River levee. Parking/staging areas may be constructed on remnants from the Southport project levee improvement property acquisition process.

A.2.5.2 Picnic Areas

Picnic areas would be provided as a part of the recreation program where space and funding permits. These areas would include picnic tables, barbecue grills, trash/recycling receptacles, and shade structures where feasible.

A.2.5.3 Water Access/Fishing Area

As a component of the Parks Master Plan, the City conducted a recreation demand analysis through which the community of West Sacramento expressed great interest in fishing and additional water access opportunities (Attachment F.1). To help meet this demand, the City is proposing installation of water access/fishing areas in the Southport area. These facilities would be fully accessible via paved pedestrian trail (see specifications above) and consist of either a paved or unpaved landing on the riverbank at suitable low-water elevations. The size of bank fishing landings would vary in response to bank slope, area of waterside berm available for use, and extent and sensitivity of vegetation and habitat at and adjacent to landings and access trails. Seating, trash/recycling receptacles, lighting, and other features would be proposed selectively at locations above the ordinary high water elevation.

A.2.5.4 Viewing Patio

A viewing patio, similar to what was built as a part of The Rivers Early Implementation Project (EIP), could be built where there is an oversized waterside bench or where such a feature would not interfere with flood management infrastructure. A viewing patio would provide a view of the river or floodway and include benches, trash/recycling receptacles, and possibly interpretive signage. The patio itself would be approximately 20 feet in diameter and would connect to the nearest linear feature via a paved, ADA-accessible trail.

A.2.5.5 Adventure Play Area

An adventure play area is a nontraditional playground that encourages children to play creatively and interact with their environment. Although an adventure play area may have some conventional play equipment, it primarily uses nature and vegetation as the play setting and nature as the play materials. The goal is for children to experience an adventure play area as a place where they can reclaim the magic that is the hallmark of child's play—the ability to learn in a natural environment through exploration, discovery, and the power of their own imagination. The location, size, configuration, program, and funding for adventure play opportunities have not been determined at this time.

A.2.5.6 Fitness Trail

A fitness trail consists of a path or course equipped with obstacles or outdoor exercise equipment stations distributed along its length. Traditional fitness trails have featured simple wood and metal exercise stations (chin-up bars, body curl benches, etc.), but newer incarnations are incorporating outdoor gym equipment with moving parts (often made from galvanized metal) and natural features such as climbable rocks. The location, size, configuration, program, and funding for fitness trail opportunities have not been determined at this time.

A.2.5.7 Disc Golf Course

Disc golf is similar to regular golf; however, instead of using golf clubs and balls to reach a hole, disc golf players use flying discs (slightly smaller and heavier than Frisbees™) and aim for a target, which is usually a pole extending up from the ground with chains and a basket where the disc lands. The object of the game is to complete each hole in the fewest number of throws, starting from a tee area and finishing at the target. Generally, a course contains 9 or 18 targets. Disc golf courses are able to use a wide variety of terrain; often, land not suitable for other park activities or development is appropriate terrain for a disc golf course.

Disc golf courses require three basic types of infrastructure: tee pads, targets, and signage. Tee pads are evenly graded areas that are 5 to 6 feet wide and 10 to 20 feet long, and may be surfaced with decomposed granite (or other natural materials), concrete, or recycled rubber mats. Targets vary in size, but generally consist of a basket that is 2.5 feet tall and 2 feet in diameter mounted on a pole that is 2 to 2.5 feet tall. The entire assembly is approximately 4.5 to 5 feet tall (flagging or signage may extend on top for visibility), with an 18-inch portion anchored underground in concrete (Disc Golf Association 2011; Professional Disc Golf Association 2010). Signs near each target indicate the direction to the next tee, and signs at each tee describe the hole number, length, teeing direction, and recreational par. The length of an average course is generally 200–240 feet per hole, with 150 feet per hole the usual low-end limit (Professional Disc Golf Association 2011). The location, size, configuration, program, and funding for disc golf opportunities have not been determined at this time.

A.2.6 Active, Localized Facilities: High-Intensity Developed Facilities

A.2.6.1 Boat Ramp/Beach Access

A combined boat ramp and beach access is proposed in the Southport project area to meet the local demand for improved water access. Such a facility may include the following elements (all ADA accessible).

- Boat ramp with boarding floats and lighting.
- Beach access.
- Parking area with security gates.
- Restrooms.
- Picnic areas with barbecue grills, some with shade structures.
- Fish cleaning station.
- Trash/recycling receptacles and safety signage.

While the facility would be new, it would be built only at a location that has been previously disturbed, or as an expansion of existing facilities. Though the City has made no plans to acquire property or enter into operating agreements for a new boat ramp, two sites along Recreation Corridor 1 serve as examples of what might fit the above criteria. The first is the defunct marina site in the Oak Hall Bend area. This site could be repurposed for a boat ramp to reestablish a previously operating water access facility. Another example is the Sherwood Harbor Marina. The operator of

Sherwood Harbor Marina has expressed interest in working with the City to construct a publicly accessible boat ramp on Sherwood Harbor property. The ramp would be privately operated, but would be publicly accessible and provide revenue to the City of West Sacramento. Either of these, or other sites that fit the criteria, are possibilities under consideration.

A.2.7 Operations and Maintenance

O&M activities for paved trails and parking areas may include annual mechanical sweeping and cleaning, annual replacement and smoothing of the shoulders, annual inspection for pavement integrity, crack filling every several years, and cleaning and repairing signage and access controls. O&M activities for other recreation improvements may include annual inspection and restoration, weekly cleaning, vegetation management, and other activities typical for municipal park facilities.

A.3 References

Blackburn Consulting. 2011. Technical Memorandum, Geotechnical Design Document, Southport Early Implementation Project—Final Preliminary Design. Table 1: Subsurface Materials and Conditions. July 29, 2011.

City of West Sacramento. 1996. *Southport Design Guidelines.* April. Amended November 12, 2005. Planning Department. West Sacramento, CA.

Disc Golf Association. 2011. *Disc Golf Basket Installation*. Last revised: 2011. Available: <http://www.discgolf.com/installation/basket-install.html>. Accessed: October 16, 2011.

Professional Disc Golf Association. 2010. *Guidelines & Procedures for Manufacturers to Certify that Equipment Complies with PDGA Technical Standards*. Last revised: June 15, 2010. Available: < http://www.pdga.com/files/documents/PDGATechStandards_61510.pdf>. Accessed: October 16, 2011.

Professional Disc Golf Association. 2011. *PGDA Disc Golf Course Design Guidelines*. Last revised: May 1, 2011. Available: <http://www.pdga.com/files/documents/PDGACourseDesignGuides2011.pdf>. Accessed: October 16, 2011.

1 **Table A-1. Compatible Recreation Elements by Segment**

		Linear Facilities																	Active, Localized Facilities							
		Multi-Purpose Trails						Rec-Only Trails							Low-Intensity Trail Amenities				Moderate-Intensity Developed Facilities							High-Intensity
Segment		Levee-Top Bike Trail/O&M Road (existing levee)[2]	Levee-Top General Purpose Road with Bike Lanes (existing Levee)	Levee-Top Bike Trail/O&M Road (setback levee)[2]	Levee Toe Bike Trail/O&M Road[2]	Floodway Bike Trail/O&M Road[2]	Bike Lanes along Village Parkway	Levee-Top Dedicated Bike Trail (existing levee)[3]	Levee-Top Equestrian Trail (existing levee)[4]	Landside Mitigation Area Bike Trail[5]	Waterside Paved Path[6]	Waterside Equestrian Trail[7]	Floodway Dedicated Bike Trail[3]	Floodway Equestrian Trail	Access Controls[8]	Wayfinding/Direction/Rules	Seating[9]	Interpretive Kiosks[10]	Landside Parking/Staging Area[11]	Picnic Areas[15]	Water Access/Fishing Area	Viewing Patio[16]	Adventure Play Area	Fitness Trail[17]	Disc Golf[18]	Boat Ramp/Beach Access
Alternative 1 Adjacent Levee[1]																										
A	Adjacent levee with cutoff wall and riprap	√			√					√					√	√	√	√				√		√		
B	Adjacent levee with berm and riprap				√			√		√					√	√	√	√	√[12]			√		√		
C	Adjacent levee with berm and riprap				√			√		√	√	√			√	√	√	√		√	√	√		√		
D	Adjacent levee with cutoff wall and riprap				√			√		√					√	√	√	√	√[13]			√		√		
E	Setback levee with seepage berm/cutoff wall and riprap			√	√			√		√	√	√			√	√	√	√		√	√	√	√	√		√[19]
F	Adjacent levee with berm and riprap				√			√		√					√	√	√	√	√[14]			√		√		
G	Adjacent levee with cutoff wall and riprap				√			√		√					√	√	√	√				√		√		

		Linear Facilities																	Active, Localized Facilities							
		Multi-Purpose Trails						Rec-Only Trails							Low-Intensity Trail Amenities				Moderate-Intensity Developed Facilities							High-Intensity
Segment		Levee-Top Bike Trail/O&M Road (existing levee)[2]	Levee-Top General Purpose Road with Bike Lanes (existing Levee)	Levee-Top Bike Trail/O&M Road (setback levee)[2]	Levee Toe Bike Trail/O&M Road[2]	Floodway Bike Trail/O&M Road[2]	Bike Lanes along Village Parkway	Levee-Top Dedicated Bike Trail (existing levee)[3]	Levee-Top Equestrian Trail (existing levee)[4]	Landside Mitigation Area Bike Trail[5]	Waterside Paved Path[6]	Waterside Equestrian Trail[7]	Floodway Dedicated Bike Trail[3]	Floodway Equestrian Trail	Access Controls[8]	Wayfinding/Direction/Rules	Seating[9]	Interpretive Kiosks[10]	Landside Parking/Staging Area[11]	Picnic Areas[15]	Water Access/Fishing Area	Viewing Patio[16]	Adventure Play Area	Fitness Trail[17]	Disc Golf[18]	Boat Ramp/Beach Access
Alternative 2: Setback Levee																										
A	Strengthen-in-place (SIP)[20] with cutoff wall and riprap	√			√				√						√	√	√	√				√		√	√	
B	SIP/adjacent levee/ setback levee with cutoff wall/berm and riprap	√	√	√	√	√	√	√	√				√	√	√	√	√	√	√[12]	√	√	√		√	√	√[21]
C	Setback levee with berm	√		√	√	√	√		√		√	√	√	√	√	√	√	√		√	√	√		√	√	
D	Setback levee with cutoff wall		√	√	√	√	√	√	√				√	√	√	√	√	√	√[13]	√	√	√		√	√	√[19]
E	Setback levee with cutoff wall/berm (Bees Lakes open to flow)		√	√	√	√	√	√	√		√	√	√	√	√	√	√	√		√	√	√	√	√	√	
F	Setback levee with berm	√	√	√	√	√	√	√	√				√	√	√	√	√	√	√[14]	√	√	√		√	√	
G	Adjacent levee[3] with cutoff wall and riprap		√		√			√	√						√	√	√	√				√		√	√	

		Linear Facilities																	Active, Localized Facilities							
		Multi-Purpose Trails						Rec-Only Trails							Low-Intensity Trail Amenities				Moderate-Intensity Developed Facilities							High-Intensity
Segment		Levee-Top Bike Trail/O&M Road (existing levee)[2]	Levee-Top General Purpose Road with Bike Lanes (existing Levee)	Levee-Top Bike Trail/O&M Road (setback levee)[2]	Levee Toe Bike Trail/O&M Road[2]	Floodway Bike Trail/O&M Road[2]	Bike Lanes along Village Parkway	Levee-Top Dedicated Bike Trail (existing levee)[3]	Levee-Top Equestrian Trail (existing levee)[4]	Landside Mitigation Area Bike Trail[5]	Waterside Paved Path[6]	Waterside Equestrian Trail[7]	Floodway Dedicated Bike Trail[3]	Floodway Equestrian Trail	Access Controls[8]	Wayfinding/Direction/Rules	Seating[9]	Interpretive Kiosks[10]	Landside Parking/Staging Area[11]	Picnic Areas[15]	Water Access/Fishing Area	Viewing Patio[16]	Adventure Play Area	Fitness Trail[17]	Disc Golf[18]	Boat Ramp/Beach Access
Alternative 3: Slope-Flattening[22]																										
A	SIP with cutoff wall and riprap	√			√					√					√	√	√	√								
B	SIP with berm and riprap				√					√					√	√	√	√	√[12]							
C	SIP with berm and riprap				√					√	√	√			√	√	√	√		√	√	√				
D	SIP with cutoff wall and riprap				√					√					√	√	√	√	√[13]							
E	SIP with cutoff wall				√					√	√	√			√	√	√	√		√	√	√	√			√[19]
F	SIP with berm and riprap				√					√					√	√	√	√	√[14]							
G	SIP with cutoff wall and riprap				√					√					√	√	√	√								

		Linear Facilities																	Active, Localized Facilities							
		Multi-Purpose Trails						Rec-Only Trails							Low-Intensity Trail Amenities				Moderate-Intensity Developed Facilities							High-Intensity
Segment		Levee-Top Bike Trail/O&M Road (existing levee)[2]	Levee-Top General Purpose Road with Bike Lanes (existing Levee)	Levee-Top Bike Trail/O&M Road (setback levee)[2]	Levee Toe Bike Trail/O&M Road[2]	Floodway Bike Trail/O&M Road[2]	Bike Lanes along Village Parkway	Levee-Top Dedicated Bike Trail (existing levee)[3]	Levee-Top Equestrian Trail (existing levee)[4]	Landside Mitigation Area Bike Trail[5]	Waterside Paved Path[6]	Waterside Equestrian Trail[7]	Floodway Dedicated Bike Trail[3]	Floodway Equestrian Trail	Access Controls[8]	Wayfinding/Direction/Rules	Seating[9]	Interpretive Kiosks[10]	Landside Parking/Staging Area[11]	Picnic Areas[15]	Water Access/Fishing Area	Viewing Patio[16]	Adventure Play Area	Fitness Trail[17]	Disc Golf[18]	Boat Ramp/Beach Access
Alternative 4: Blended Setback Levee																										
A	SIP[20] with cutoff wall and riprap	√			√				√						√	√	√	√				√		√	√	
B	SIP/adjacent levee/ setback levee with cutoff wall/berm and riprap	√	√	√	√	√	√	√	√				√	√	√	√	√	√	√[12]	√	√	√		√	√	
C	Setback levee with berm	√		√	√	√	√		√		√	√	√	√	√	√	√	√		√	√	√		√	√	√[21]
D	Setback levee with cutoff wall		√	√	√	√	√	√	√				√	√	√	√	√	√	√[13]	√	√	√		√	√	
E	Setback levee with cutoff wall/berm		√	√	√	√	√	√	√		√	√	√	√	√	√	√	√		√	√	√	√	√	√	√[19]
F	Adjacent levee[2] with berm		√		√		√	√	√						√	√	√	√	√[14]			√		√	√	
G	Adjacent levee[2] with cutoff wall and riprap		√		√			√	√						√	√	√	√				√		√	√	

General Notes

- The approach for initial development of recreation benefits is to (1) integrate recreational features with appropriate components of levee improvements, (2) accommodate future recreation development in refinements to finish grading plans and (3) anticipate future recreation development through design configurations.
- Recreation features must comply with ADA requirements.
- Recreation features should not cause vegetation or habitat impacts in excess of levee improvements.
- Trail materials and surfaces must accommodate the range of intended users while minimizing operations and maintenance (O&M) requirements associated with particular settings.

Specific Notes

[1] Construction of an adjacent levee may result in a wider levee crown than currently exists, so some levee-top recreation enhancements are checked as potentially feasible under this alternative.

[2] Class I equivalent bikeway that also serves as an O&M road, with 4-foot compacted shoulders on each side for pedestrians, or at minimum, O&M road that is open to public recreational use (bikes/pedestrians).

[3] Class I bikeway with 4-foot compacted shoulders on each side for pedestrians.

[4] Equestrian trail is non-paved but is constructed of stabilized road base at 50,000 lb rating.

[5] If additional landside property is purchased parallel to the flood control structure for mitigation purposes, a bike/pedestrian trail (paved or all-weather surface) could be threaded through this area.

[6] Paved path is ADA-compliant for pedestrians and has a minimum width of 36 inches. In places where the trail is less than 5 feet wide, there are passing areas at least every 200 feet. The trail is located on the waterside of the existing levee where there is an appropriately wide bench.

[7] Equestrian trail is located on the waterside of the existing levee where there is an appropriately wide bench.

[8] Access controls would be constructed as needed for non-vehicular pathways or for authorized vehicle control.

[9] Seating areas would consist of benches and trash/recycling receptacles.

[10] Interpretive kiosks will only occur where other recreation features are placed.

[11] Landside Parking/Staging Area would include surfaced vehicle parking, trash/recycling receptacles, rules/wayfinding signs, seating (if appropriate), and restrooms (if feasible).

[12] Parking/access/restrooms in Segment B are at intersection of Gregory and SRR.

[13] Parking/staging in Segment D are at landside intersection of Davis Road and levee.

[14] Parking/staging in Segment F are at landside intersection of Linden and levee.

[15] Picnic areas would include picnic tables, grills, trash/recycling receptacles, and shade structures (if feasible).

[16] Viewing patio is an off-water platform similar to what was constructed at The Rivers EIP site, with seating and trash/recycling receptacles, constructed at wide spots in the Right-of-Way .

[17] Though a fitness trail is a possibility for any of the identified segments, only one fitness trail would be built as a part of the Southport EIP.

[18] Though a disc golf course is a possibility for any of the identified segments, only one disc golf course would be built as a part of the Southport EIP.

[19] The operator of Sherwood Harbor Marina has proposed constructing a publicly-accessible boat ramp, as part of the Southport EIP, on his property. The ramp would be privately-operated, but would be publicly accessible and provide revenue to the City of West Sacramento. The operator makes the argument for this location based on the facts that they already have a lot of existing infrastructure and are situated on a deep stretch of the Sacramento River that will not have silt issues.

[20] Strengthening in place may involve slope-flattening, which could result in a wider levee crown than currently exists; so some levee-top recreation enhancements are checked as potentially feasible for this segment.

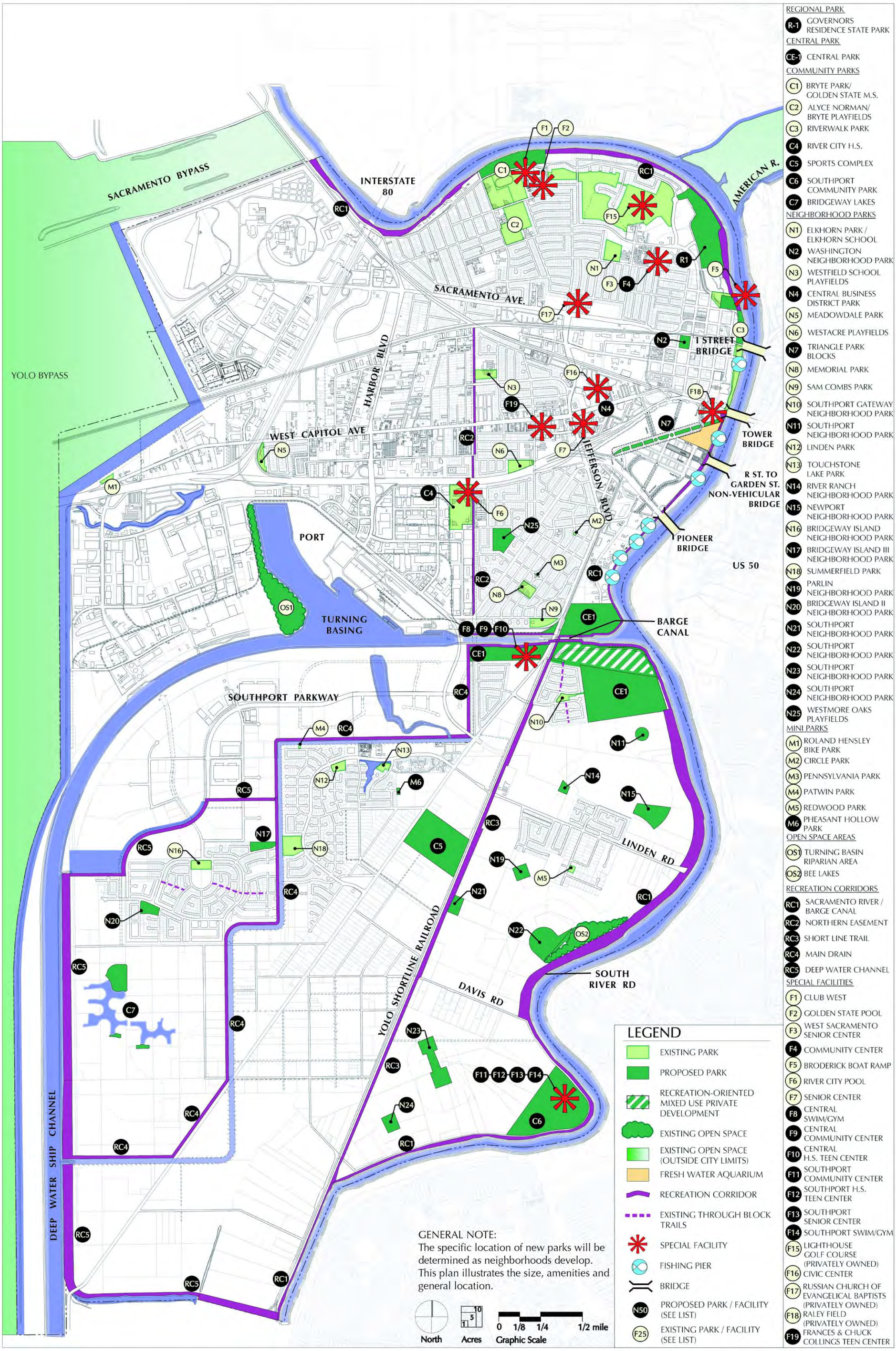
[21] A boat ramp in Segment C would reuse the defunct marina site on Oak Hall Bend.

[22] Slope-flattening could result in a wider levee crown than currently exists, so some levee-top recreation enhancements are checked as potentially feasible under this alternative.

City of West Sacramento
parks master plan

Prepared for: City of West Sacramento Department of Parks & Community Services

Prepared by: SmithGroup JJR **September 2003**



CITY OF WEST SACRAMENTO - PARKS MASTER PLAN

SEPTEMBER 2003

SmithGroup JJR

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Clockwise from upper left: **1.** Vadim Telchak, "Bye-bye Spring," Southport Playground
2. Reid Collins, Row, Row, Row, Deep Water Ship Channel **3.** Gary Clements, River Walk Secrets
4. SmithGroup JJR **5.** Bob Gully, Fishin' on the Port **6.** SmithGroup JJR **7.** James Tapia: The Winning Run, Memorial Park.

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1. Executive Summary

Purpose of the Parks Master Plan

This document is a long-range plan that guides the development, operation, and maintenance of the City's park and open space system. It is intended to be a "living document" that is regularly used by City Staff, Commissions, and Council as a tool for planning and decision making. Preparation and regular updating of the Parks Master Plan is required by the City's General Plan. The policies contained in the General Plan create the basis upon which the Parks Master Plan recommendations are developed in greater detail.

The 1991 Parks Master Plan

The City's first Parks Master Plan was adopted in 1991. It remains in effect until such time as this updated Parks Master Plan is adopted by the City Council. The 1991 Plan contains the following major actions and recommendations:

- The standard for park acreage was raised from the 3.33-acre standard contained in the General Plan to 5 acres per 1000 residents (2 acres of neighborhood parks and 3 acres of community parks per 1000 residents).
- The Parks Master Plan describes a complete system of recreation facilities to serve the ultimate build-out population.
- The recreation corridor concept was introduced to take advantage of the City's unique geography.
- The parks development impact fee ordinance was updated based on the ultimate build-out parks system.
- New neighborhood parks were located to best serve existing and new development.
- Improvements to existing facilities were described.
- New special use facilities including senior centers, municipal swim centers, teen centers, community centers, and a sports complex were described.

Changed Conditions in West Sacramento

Conditions have changed in the ten years since the first Parks Master Plan was prepared. In many ways, West Sacramento is a different city than it once was. The City was in its infancy in 1991, having been recently incorporated in 1987. Today the City has grown and matured. The municipal government is well established. Planning and zoning frameworks are in place. Redevelopment of the City's blighted areas is being implemented. Development impact fees are in place to ensure that new development finances for increased demand upon City services.

The City has gone through the recession of the early 1990's, the recovery of the late 1990's, and is now experiencing the recession of the early 2000's. The City is experiencing major growth during the current recessionary economic time, however, due to pent-up demand for new housing construction. In addition, significant investment in new industry and commercial development is occurring. The Ziggurat, Raley Field, and the new River Walk Park have been recently implemented, spurring on the creation of a revitalized riverfront district.

Based on available census data, from 1990 to 2000, the City's population increased by 18 percent, from 28,869 to 31,615. Much of this growth occurred within the last two years, in response to new infrastructure improvements that have made residential development in Southport more attractive.

The Southport Framework Plan was adopted shortly after adoption of the 1991 Parks Master Plan. The Framework Plan incorporated many, but not all, of the Parks Master Plan recommendations. The most significant variations from the Parks Master Plan include the omission of a dedicated sports complex, and designation of other, non-recreation uses for the proposed large community park located on federal property south of the barge canal and east of Jefferson Avenue. A goal of the current parks master planning process is to reconcile differences between the Southport Framework Plan and the Parks Master Plan.

Lake Washington with Port of Sacramento in the background

Progress Made

Implementation of the 1991Parks Master Plan recommendations was hindered by the economic recession of the early 1990's. During this time, municipal tax revenues were significantly reduced to help make up shortfalls in the State budget, leaving limited funding for parks and recreation.

Significant new residential construction was expected to occur as the economy recovered during the second half of the 1990's. However, development was delayed due to the lack of new infrastructure in Southport. Construction of the Harbor Boulevard widening in 1995 and the Palamidessi Bridge across the Barge Canal in 1997 opened the way for increased building activity. The new residential construction that has occurred in 2000, 2001, and 2002 has finally begun to generate the cash flow needed for new public services, including parks and schools. New residents of Southport are eagerly awaiting these improvements.

The City has made significant progress in the face of these difficulties, however. These achievements include:

- River Walk Park
- Club West Teen Center
- Improvements to the Broderick Boat Ramp
- Development of Summerfield Park
- Construction of the Alyce Norman/Bryte youth sports complex
- Dedication of new neighborhood park sites in the Bridgeway Island subdivision
- Raley Field (private investment)
- School open space improvements at Elkhorn, Golden State, Westfield, and Westacre

Opportunities and Assets

West Sacramento is blessed with many opportunities for the creation of a premier system of park and recreation facilities. There are many underdeveloped natural, political, and economic assets that may be taken advantage of as the City moves forward:

- **The Sacramento River**: The river is central to the identity and image of the City. The confluence of the American and Sacramento Rivers is one of the unique places that attract many people. However, opportunities to enjoy the river are hampered by the lack of developed public access. Historically, the river was a threat due to flooding. Tall levees were constructed to keep the floodwaters out, and in the process also served to separate the people from the river. Providing convenient and safe public river access that is also sensitive to the natural environment is a key opportunity.

- **Other Waterways:** The Deep Water Ship Channel, Turning Basin, and Barge Canal are other underutilized water resources. Improved public access to these waters is another key opportunity.

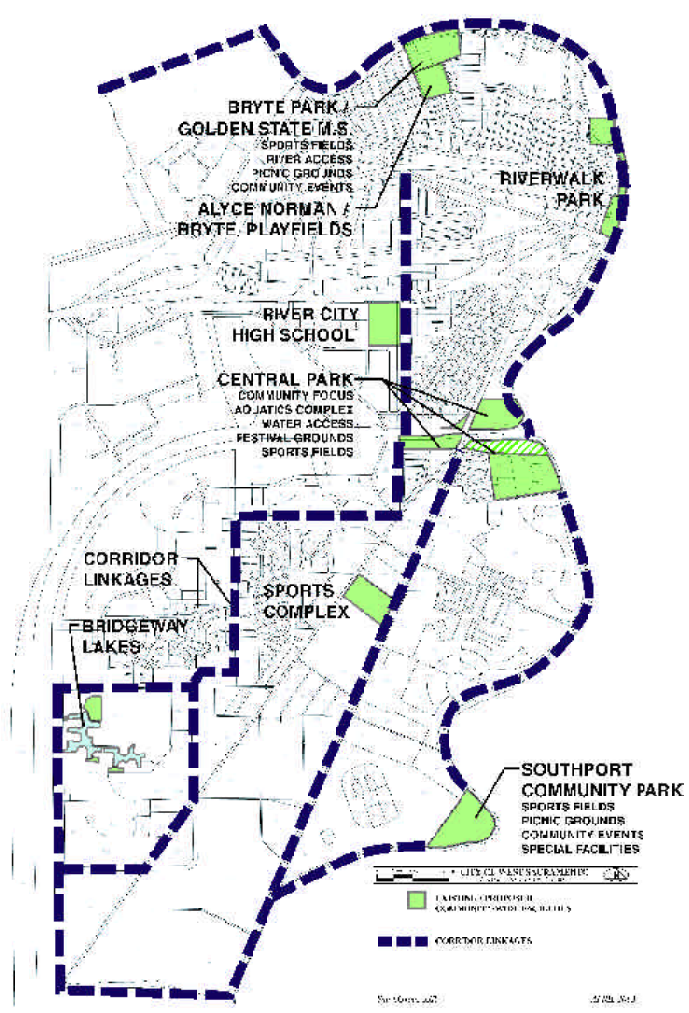
- **Existing Corridors:** The City has many natural corridors that represent underutilized assets (Figure 1-2). In addition to the river and Deep Water Channel, other corridors exist along the Yolo and Sacramento Bypass, the Main Drainage Canal, other minor canals, and utility rights-of-way. These corridors are an opportunity for development of pedestrian and non-motorized linkages that can be used for transportation as well as recreation. They are assets that may be used to tie together a community that has been divided by roads, geography, and development patterns.

- **Significant Natural Resources:** In addition to its water resources, West Sacramento contains riparian forests and wetlands. These areas are assets worthy of protection. They are also an opportunity to provide public access for enjoyment and education/natural history interpretation.

- **Undeveloped Land:** Land suitable for development of new parks remains available, especially in Southport.

- **Redevelopment:** Opportunities for park improvements in the older sections of the City may be available through the Redevelopment Agency.

Figure 1-2: Community Parks & Corridor Linkages



The Planning Process

The current planning process involves five main components:

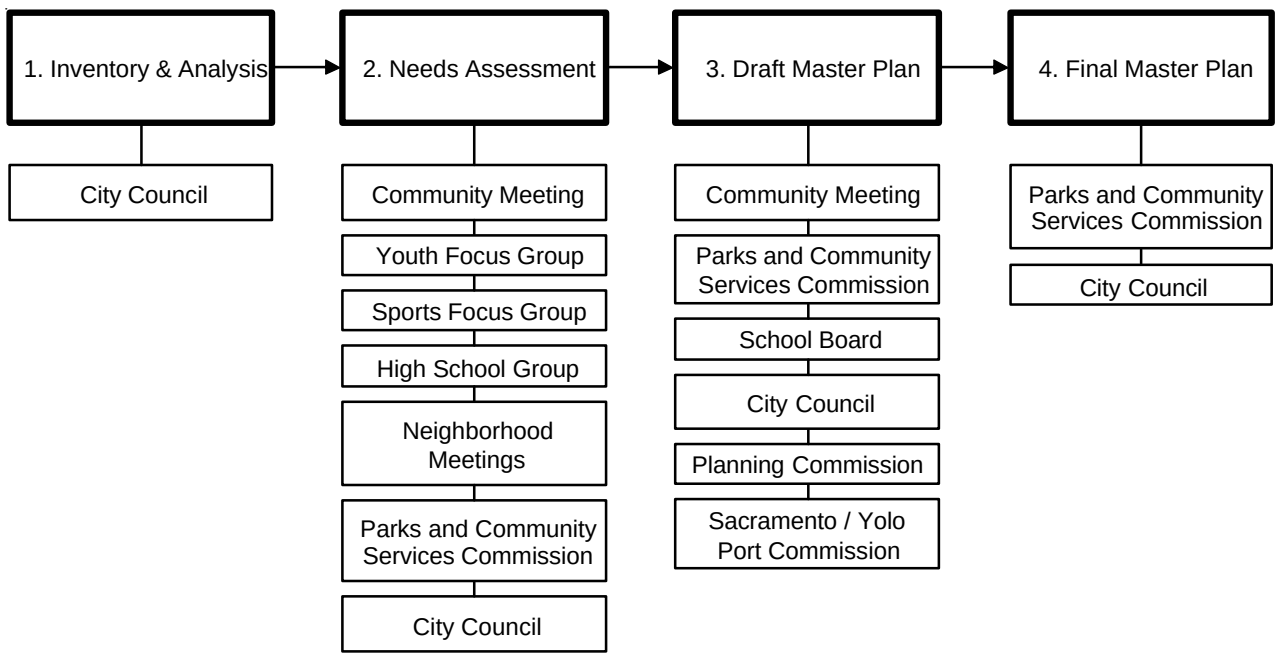
1. Inventory and analysis of existing parks and recreation facilities.
2. Analysis of current demand and future trends.
3. Identification of goals and priorities to guide the development of the system.
4. Development of action plan recommendations.
5. Creation of an implementation plan to quantify costs, funding, operation, and maintenance of the system.

The planning process (Figure 1-3) includes four phases. The following meetings have been conducted to facilitate public involvement in the planning process:

• City Council	September 12, 2001
• Community Workshop Meeting	October 9, 2001
• Youth Focus Group	October 10, 2001
• Active Recreation Focus Group	October 10, 2001
• High School Leadership Group	October 19, 2001
• Meadowdale Neighborhood Meeting	October 26, 2001
• Washington Neighborhood Meeting	November 13, 2001
• Parks and Community Services Commission Meeting	December 4, 2001
• Community Workshop	December 11, 2001
• Bridgeway Island Neighborhood Meeting	December 18, 2001
• Washington Unified School Board	March 28, 2002
• Parks and Community Services Commission	December 3, 2002
• City Council	December 18, 2002
• Sacramento/Yolo Port Commission	January 6, 2003
• Planning Commission	January 16, 2003
• Sacramento Riverfront Master Plan Update	Ongoing

In addition, meetings were held with the City Manager, Redevelopment Agency, Department of Community Development, Port of Sacramento, Reclaimation District 900 and the West Sacramento Police Department to gather input. Moving forward, the Draft and Final Master Plan will be brought to the Parks and Community Services Commission, the School Board, and the City Council. These meetings will be open to the public who will be given the opportunity to comment.

Figure 1-3: Planning Process Diagram



Regional Setting

West Sacramento is located on Interstate highway 80 midway between the San Francisco Bay Area and Lake Tahoe. The city of Sacramento lies to the east across the Sacramento River. The Sacramento Bypass to the north and Yolo Bypass to the west are large land reserves that carry winter floodwaters, provide wildlife habitat, and are used for agricultural production. To the south lies farmland along the Sacramento River. West Sacramento is part of the metropolitan Sacramento Area. Nearby recreation resources include the City of Sacramento parks system and County of Sacramento parks system. Regional recreation destinations include Folsom Lake and Lake Berryessa.

Sacramento River

Local Setting

West Sacramento is geographically defined by its water resources and has been historically influenced by its proximity to the confluence of the American and Sacramento Rivers. The rivers offer many recreational activities, including boating and fishing. Several privately operated marinas, and the publicly operated Broderick Boat Ramp, provide river access. The Deep Water Ship Channel and Turning Basin at the Port of Sacramento provide additional opportunities, including sailing and rowing. The Deep Water Channel also divides the City into two parts: the northern half which is made up of established residential neighborhoods, the Port of Sacramento, and developed industrial areas; and the southern half, which is largely undeveloped with farmlands, three established residential areas and three new subdivisions.

Key Factors

West Sacramento is a unique community. Several factors have direct bearing on the formulation of recommendations contained within the Parks Master Plan:

- West Sacramento is a city of opportunity, characterized by an abundance of underdeveloped assets.
- The City is surrounded by major waterways that give it much of its character.
- West Sacramento is a diverse community that reflects its historical formation from several unincorporated communities and a large rural land area.
- The City is divided into two halves by the Shipping Channel and Barge Canal. The southern half is largely undeveloped, with an ample supply of available land for park development. The northern half is largely built out, with few opportunities for new park development.
- The City's population is expected to reach 75,000 by the year 2025, more than double the current population. The Parks Master Plan's recommendations are based on an anticipated build-out population of 77,000.
- Most of the population growth will occur in Southport in the form of suburban-style development, and in the Triangle Specific Plan Area, in the form of high-density urban development.
- New housing development will generate development impact fees and land dedications to provide for the recreation needs of new residents. The Southport Framework Plan includes a system of parks and recreation corridors that are based on the 1991 Parks Master Plan.
- The City has emerged from its infancy and has greater financial resources than it did at the time the 1991 Parks Master Plan was prepared.

Park and Recreation Facility Types

The facilities described by the Parks Master Plan can be organized into seven primary categories based on National Recreation and Parks Association (NRPA) standards:

- **Regional Park:** A regional park is a large park, typically organized around a significant geographical feature such as a lake, mountain, forest or coastline, and that serves several communities within a one hour driving time. Regional parks are typically administered by the state, counties, or other park agencies rather than municipalities due to their large size and unique nature.
- **Central Park:** A large urban park that contains a wide range of facilities and that serves the entire city. A central park is essentially a community park that has an elevated status due to its central location, unique features, historic characteristics, or great size. West Sacramento does not currently have a central park.
- **Community Park:** A large park (typically over 20 acres) that contains a wide range of facilities and that serves several neighborhoods or the entire community. The Bryte Park/Golden State Middle School/Alyce Norman-Bryte Playfields complex are collectively considered to be a

community park. River Walk Park, although not of the typical size, serves the entire community.

- **Neighborhood Park:** A medium sized park (4 to 10 acres) that serves the informal recreation needs of a single neighborhood. An example is Elkhorn Park.

- **Mini Park:** A small tot lot or passive sitting area (under 1 acre) that serves the daily recreation needs of a small area. An example is Redwood Park.

- **Special Facility:** A recreation facility that serves a specific need or user group, such as a community center, senior center, municipal gymnasium or swim center. Examples include the West Sacramento Senior Center and the pools at Golden State Middle School and River City High School.

- **Recreation Corridor:** A linear park that includes multi-use pathways for recreation and non-motorized transportation.

- **Open Space Area:** Undeveloped natural areas that contain significant natural resources.

NEIGHBORHOOD PLANNING AREAS

The Parks Master Plan subdivides the City into 20 neighborhood planning areas (Figure 1.4). Geographic features such as the river, deep water channel, canals, highways, major arterial roadways, and railways define these areas. Each neighborhood planning area should contain at least one neighborhood park or community park within walking distance of each resident.

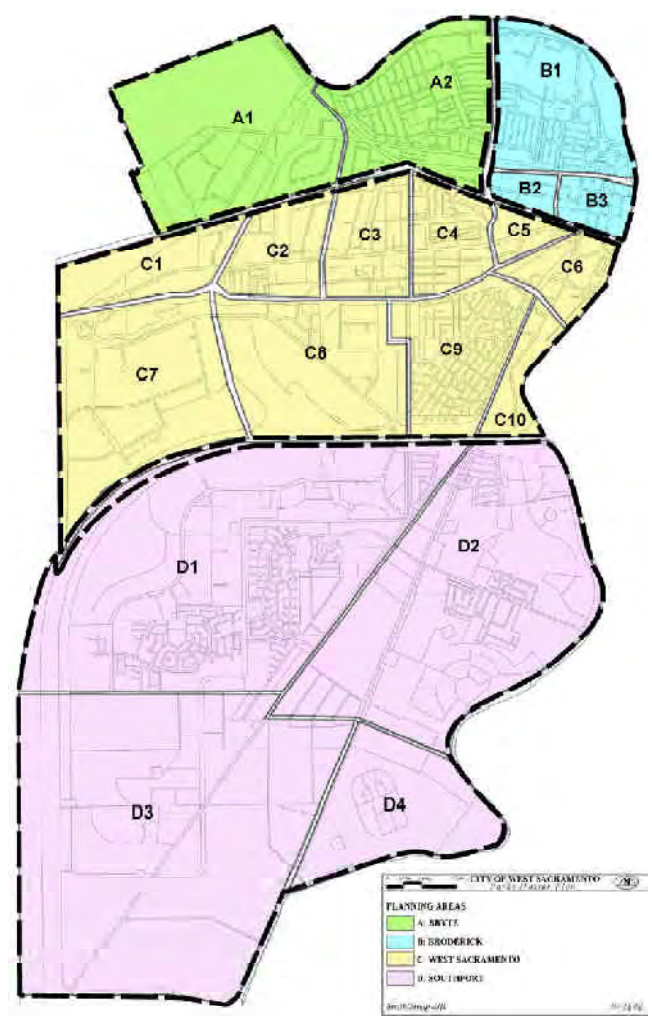


Figure 1-4: Neighborhood Planning Areas

Existing Parkland Acreage and Acreage Standards

West Sacramento has 104 acres of developed city parks. This equates to 3.06 acres of parkland for every 1000 residents, based on a current estimated population of 34,000. This total includes parks that provide for daily recreation needs: neighborhood, mini, and community parks.

The 1991 Parks Master Plan established a standard of 5 acres per 1000 residents. On a citywide basis, 170 acres are required by this standard, leaving the City with a current shortfall of approximately 69 acres.

In the year 2025, a total of 375 acres of parkland would be required to serve the pro-

jected population of 75,000.

ADA and CPSC

The Americans with Disabilities Act (ADA) is federal legislation enacted to protect the rights of disabled people in employment, public accommodations, telecommunications, and state and local government services. The California State building code requires conformance with the ADA for all public buildings, parks, and outdoor spaces. The Consumer Product Safety Commission (CPSC) has established safety guidelines for public playgrounds. A survey of existing facilities for compliance with the ADA and CPSC is outside the scope of this document.

Demand for Park and Recreation Facilities

As a provider of public services, it is important for the City to determine the community's demand for those services. If demand is underestimated, facilities deteriorate through overuse. Conversely, if demand is overestimated, facilities are underused and represent wasted resources. The following techniques were used to determine demand:

- Analysis of demographics.
- Analysis of trends surveys.
- A telephone opinion survey
- Comparison with other communities.
- Parks Master Plan standards.
- Public involvement workshops (several).
- Written questionnaires.
- Professional judgement.

The demand analysis is discussed in greater detail in the Appendix. The reader is encouraged to review the opinion survey report document (available under separate cover through the Parks and Community Services Department). Based on the various components of the demand analysis, the following summary of demand is presented (not in order of importance):

- **A Central Park:** West Sacramento currently lacks a large park containing a variety of facilities that can be used as a community gathering space. Participants in the Community Workshop rated this as a high priority, and expressed a desire for a single park that would provide facilities for all age groups and interest. They also viewed such a facility as a means to improve the image of the City and provide an enhanced community identity.

- **Improved water access:** Residents value the water resources available in West Sacramento. They desire improved access to water-related recreation such as fishing, boating, swimming, and passive use.

- **Increased number and variety of facilities:** The City received low scores in the opinion survey relative to other California communities for the number and variety of facilities available.

- **Improvements to existing parks:** Participants expressed the perception that the City's parks are tired and old. Safety of park users is also of concern.

- **Recreation corridors and trails:** The corridor concept was supported in the public meetings and through the high scores received in the survey for bicycling, walking, and horseback riding.

- **Programs and activities for children and youth:** A high level of importance was expressed for providing after-school and sports programs for children and teens. Construction of a high school age teen center was also highly rated. The youth workshop participants expressed a desire for skatepark facilities.

- **Swimming:** Swimming is a very popular activity. A high level of support for a family aquatic park with swimming pools and water play was expressed.

- **Landscape entrances:** Beautification of gateways to the community with landscaping was rated highly in the survey.

- **Classes:** A high level of interest exists in organized classes for activities such as cooking, computer use, arts and crafts, and gardening.

- **Senior programs:** Senior nutrition and diet programs are considered to be very important.

- **Active recreation:** Facilities and leagues for youth sports were considered to be very important, while adult sports were not as highly rated.

- **Fishing and water access:** The community expressed great interest in fishing and additional water access opportunities.

Action Plan

The action plan recommendations as described in chapter 2 are derived from an analysis of existing conditions, assessment of demand, evaluation of opportunities for new facilities, and analysis of existing and future financing resources. Public participation also plays an important role in determining priorities.

Implementation Plan

The Implementation Plan described in chapter 3 provides estimated costs, describes potential funding sources, and discusses operation and maintenance. The implementation plan is be based on the priorities that surfaced during the planning process.

Monitoring Process

This document is a flexible planning tool intended to be periodically reviewed and evaluated in light of changing conditions. The plan should be updated at approximate five-year intervals.

II. Action Plan

II. Action Plan

The Action Plan outlines specific recommendations to guide the improvement and development of the City's park system. The recommendations are the culmination of the planning process. They are based on an analysis of existing conditions, assessment of demand, and the participation of the community, neighborhood groups, user groups, City staff, City Council, School Board, and Commissions.

GOALS AND OBJECTIVES

The following strategies are responsible for the physical distribution, location, and amount of park and recreation facilities that make up the master plan. These strategies were created in response to the demand assessment which forms the basis of the plan.

- Expand existing parks where feasible to provide additional acreage
- Continue joint City/School District cooperation and City/Port Cooperation to maximize the utility of existing resources, and to provide park space in areas such as the north half of the city where opportunities for new land acquisition are limited
- Acquire and develop parks to meet the standard of 2 acres of neighborhood park and 3 acres of community park per each 1000 residents
- Acquire and develop a central park to serve the entire city
- Build new community centers, senior centers, gymnasiums, teen centers and indoor soccer facilities to support the demand for recreation programs and classes.
- Construct new swimming pools and sports fields to support the demand for active recreation
- Acquire and develop recreation corridors located along watercourses and railroad right-of-ways to link the park system and provide additional recreation opportunities
- Locate new parks to take advantage of the city's natural resources, including the river and other watercourses
- Provide improved river access for boating and fishing
- Develop open space areas to protect significant wetlands and riparian forests, and to provide passive recreation opportunities
- Improve existing parks to maximize the utility of existing resources

ACTION PLAN RECOMMENDATIONS

The Action Plan describes a complete system of park and recreation facilities to serve the needs of the City of West Sacramento at its ultimate build-out population. It provides specific recommendations for the following types of facilities:

- Regional Park
- Central Park
- Community Parks
- Neighborhood parks
- Mini Parks
- Recreation Corridors
- Open Space Areas
- Special Facilities
- Sports Facilities

Future Park and Recreation Planning Process

Further planning is required for implementation of the projects outlined within this plan. The planning and design process will be similar for each specific project, with the following general sequence:

1. Secure project funding.
2. Prepare master plans for specific parks or park facilities.
3. Prepare environmental documentation.
4. Prepare preliminary design.
5. Prepare construction documents.
6. Construct the project.
7. Operate and maintain the facility

Most improvement projects will require professional design and planning services. The entire planning sequence will be open to public review. The early master plan and preliminary phases will involve public participation workshops to help determine overall direction and specific details. Compliance with the California Environmental Quality Act (CEQA) will be required for each project.

Approval by the Parks and Community Services Commission, the City Council, and possibly the Planning Commission, Redevelopment Agency and School Board will be required. Public review and comment will be an integral part of these meetings. The public will be notified of all meetings and workshops by the Parks and Community Services Department through a variety of methods. Such methods may include posting notices at the project site, notifying homeowners' associations, and publication in the local press.

The plan is intended to achieve a balance of park types best suited to City residents. Both active and passive recreation is considered equally important. The plan describes improvements to existing parks, and creation of new park and recreation facilities. These facilities are described in the following text, organized by category. Letter designations given for each facility are keyed to the park master plan diagram (Figure 1-1). Detailed development standards for each category of facility are presented in Appendix E

REGIONAL PARK

Governors Residence (R1)

A regional park is a large park, typically organized around a significant geographical feature such as a lake, mountain, forest or coastline, and that serves several communities within a one hour driving time. Regional parks are typically administered by the state, counties, or other park agencies rather than municipalities due to their large size and unique nature. When people speak of a "Regional Park" in West Sacramento, they typically are referring to a Community Park or Central Park as defined by the Parks Master Plan.

There are currently no regioinal parks in West Sacramento. However, regional usage of local parks is common. Residents of West Sacramento utilize park facilities in Sacramento and other communities. West Sacramento experiences usage in its parks by residents of other communities as well, especially at Bryte Park and the Broderick Boat Ramp, as well as along the Sacramento River, Turning Basin, and Yolo Bypass.

In 2003 the City of West Sacramento may contribute the 43-acre East Riverfront property to the State of California for Governor's residence and State Park purposes. Current plans call for 10-12 acres to be dedicated for the residence itself which would be off-limits to the general public. The remaining 31-33 acres is intended to be developed as a State Park. It is important to ensure that a continuous recreation corridor is developed along the entire waterfront of this parcel.

CENTRAL PARK

Central Park (CE1)

The community has clearly expressed a desire for a special community park that would serve the entire city and become the flagship facility for the city's park system. The following benefits of such a facility were identified:

- Provide unique recreational opportunities
- Have a unique identity
- Provide a place for active recreation
- Provide a community gathering place
- Provide for people of all ages and interests
- Take advantage of the city's waterfront
- Central location to bridge the gap between the north and south halves of the city
- Improve community image and esteem; reinforce West Sacramento's unique identity

Central Park would include active sports fields for baseball, softball, and soccer; picnic areas; tennis courts; a skate park; playgrounds; and passive green open space suitable for group gatherings and

festivals. Central Park would also provide a setting for special facilities such as a swim complex or family water park, gymnasium, and community center. A waterfront setting would be ideal for rowing and sailing clubs, and for fishing access. Once the park has been master planned, land acquisition and construction could occur in phases. The first step in the process will be to determine a suitable location.

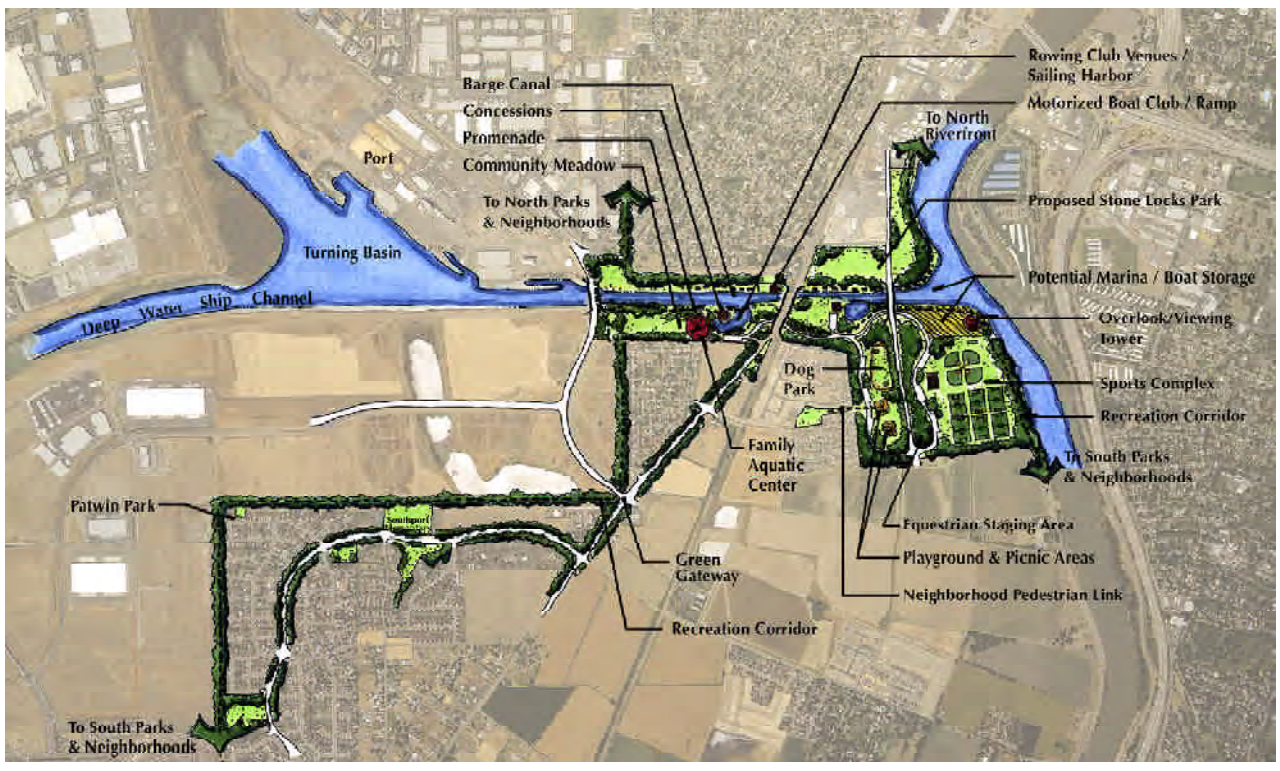
Private recreation facilities such as a marina, improved boat ramps, and boat storage could be worked into the park setting. Opportunity exists to extend a recreational corridor along the Deep Water Ship Channel and to provide an open space buffer for Southport residents adjacent to land slated for future port expansion. These opportunities should be explored in future City plans for this region.

Creation of such a park from scratch is a large undertaking that will require significant financial resources, multi- agency cooperation, public-private cooperation, and political will.

Between the Bridges

This approximately 30 acre parcel along the Barge Canal between the Jefferson Blvd. and Palamidessi Bridges is envisioned as the location for a mix of community uses that could include a family aquatic center, general use meadows, water edge promenades, concessions, rowing club venues with a sailing harbor and parking. It would be connected to the rest of Central Park via trails and an internal park-way system that travels under the Jefferson Blvd. Bridge. This parcel would also provide an important link to the Northern Easement and Main Drain Recreational Corridors.

Figure 2-1: Central Park Concept*



* The CentralPark Concept and the ideas presented are for consideration and inclusion in a central park, regardless of its actual physical location.

East Port Property

The Port is currently exploring different water-related commercial development scenarios for the Port-owned land between Jefferson Blvd. and the river along the south bank of the Barge Canal (shown in green hatch pattern in figure 2-1) such as a marina, public boat launch, retail, residential, dry stack boat storage and park space. This parcel is a key waterfront edge and connective link in the proposed Central Park concept, therefore the City and Port should work together to ensure that continuous public access along the water and public access parking are incorporated into the development of this parcel.

Federal Property

This approximately 40 acre parcel is currently under control of the U.S. Army Corps of Engineers and is being envisioned as the eastern extent of Central Park if acquired by the City. Significant public support was expressed for a sports complex in Central Park and the master plan illustrates how this program could be accommodated on the Federal property. The parcel could also accommodate a levee trail, parking and an internal parkway that could connect to the remainder of Central Park. Other options for accommodating the sports complex could be explored if this land is not acquired.

Stone Locks

The City West Sacramento and the City of Sacramento are currently collaborating on an updated plan for the Sacramento Riverfront. Strong support was voiced during this process for Stone Locks Park, a bluff top open space on the north side of the Barge Canal at its confluence with the Sacramento River. Stone Locks is envisioned as a component of Central Park in this plan. Development of Stone Locks Park is contingent on the abandonment of the existing wastewater treatment plan, slated for closure approximately 2008.

Other unique facilities such as a museum, fish hatchery, or an overlook/viewing tower could help draw people to the area and enhance community identity. Potential park expansion could include Lake Washington, where an educationally based eco-park could be developed. This would provide community-wide opportunities for nature study, and would create a nice compliment to the Southport Elementary School located just south of the Main Drain.

COMMUNITY PARKS

West Sacramento currently has two community parks and one special facility (the Broderick Boat Ramp) that together provide 46 acres of land. Bryte Park, Alyce Norman-Bryte Playfields, and the fields at Golden State Middle School can be considered as one community park that together provide 38 acres that meet the community park definition. River Walk Park is the second community park, and contains 4 acres. The Broderick Boat Ramp provides 4 acres that serve the entire community. At present, 56 additional acres of community park land are required to meet the 3 acre per 1000 population standard to serve the current population of 34,000. At buildout, a total of 231 acres (185 additional) would be required to meet the demand of a projected 77,000 population.
Joint use of existing school grounds is necessary to provide improved community park space in the northern half of the city. It should be noted that the existing grounds at River City High School are not included in the totals for existing community park acreage, because they are not cooperatively maintained through a joint use agreement between the City and the School District. Should the school grounds be improved under such an agreement, the acreage total would then be added to the existing supply of community park land.

The following existing and new community parks are proposed:

Bryte Park /Golden State Middle School (C1)
The playfields and park facilities at Bryte Park and Golden State Middle School provide 21 acres of community park space. In addition, Bryte Park serves as the only source of neighborhood park amenities for the Bryte neighborhood. An opportunity exists to increase the amount of community park acreage by extending Bryte Park to the Sacramento River. This would provide an additional 23 acres with formalized public access to the river, pathways, and picnic areas. This would also connect Bryte Park to the proposed Recreation Corridor RC1. Recommendations for improvements include:

- Address deferred maintenance items within the park, such as play equipment, picnic areas, benches, and pathways
- Install additional play areas for use by neighborhood children
- Install group picnic area for 300 people
- Incorporate adjacent levee and riverfront into the park design. Create river access and connection to riverfront recreation corridor

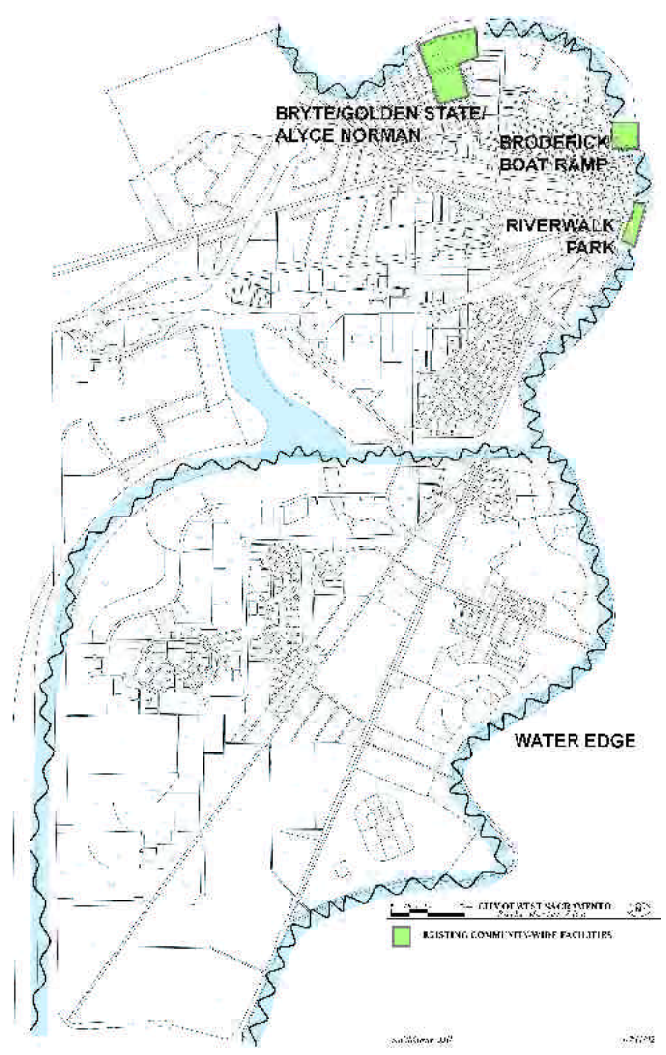


Figure 2-2: Existing Community Wide Facilities

Alyce Norman/Bryte Playfields (C2)
The playfields at Alyce Norman-Bryte Schools provide baseball, soccer, and softball fields for youth. No new improvements are required.

River Walk Park (C3)
The city's newest park is a successful riverside open space that provides pathways, sitting areas, a grand staircase, and space for community gatherings. No improvements are required.

River City High School (C4)
The high school currently functions as a community park in a limited sense by providing for public use of the swimming pool, tennis courts, and baseball fields. Of note, senior little league uses the field at River City for games and practice. Field conditions are substandard. The swimming pool design is outdated, making competitive meets difficult. Recommendations for improvements include:

- Continue joint use agreement with school district for maintenance and capital improvement projects
- Construct new community/school joint use swim pool with dressing facilities
- Reconstruct the turf fields and little league fields
- Reconstruct the tennis courts
- Add night lighting to baseball, pool, and tennis courts

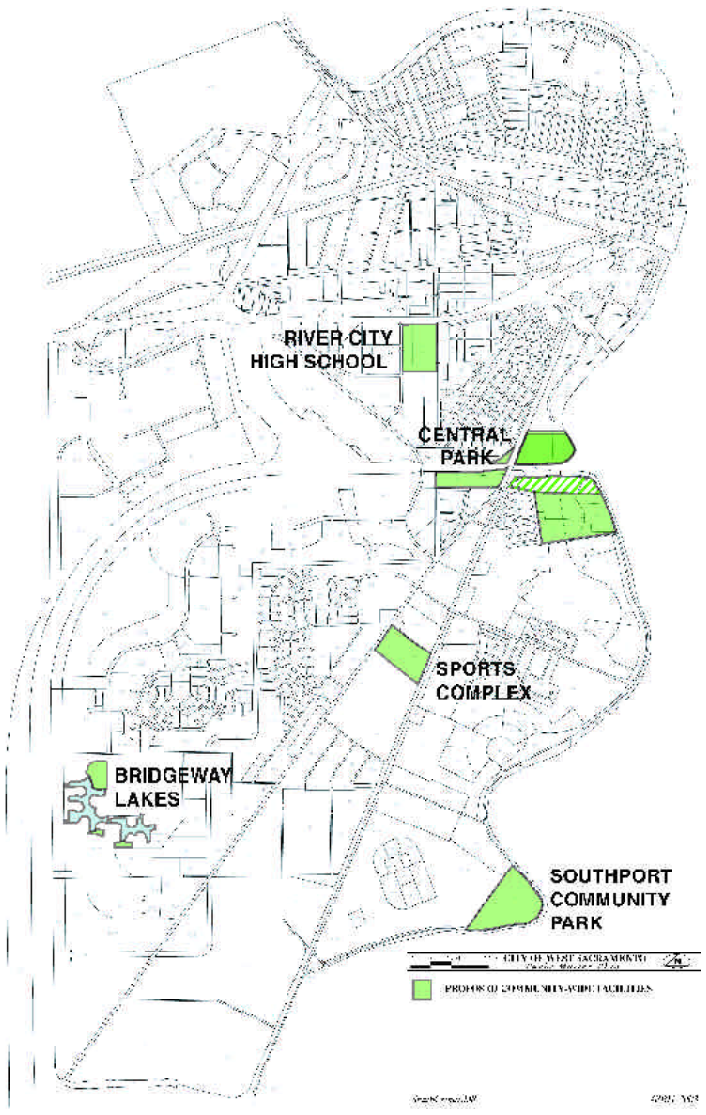


Figure 2-3: Proposed Community Wide Facilities

Sports Complex (C5)
A 50-acre sports complex should be constructed adjacent to the future high school in Southport. Several potential school locations are currently being considered. Ongoing coordination with the School District will be necessary to achieve this goal. The complex should provide up to 12 night-lighted baseball, softball, and soccer fields. It should have appropriate support facilities including concessions, restrooms, dressing rooms, and playgrounds. It could incorporate other features such as batting cages, tennis courts and sand volleyball courts and bicycle motocross to enhance revenue generation.

NOTE: The location of C5 on the Park Master Plan map is not an endorsement of a high school in this location, but to indicate the plan's philosophy of locating a large community park adjacent to the future high school, wherever it is eventually constructed.

Southport Community Park (C6)
50 acres in southeastern Southport would be developed into a riverfront community park, and would tie into the riverfront recreation corridor.

Bridgeway Lakes Community Park (C7)
A new 41.5 acre (11.5 acres of land, 31 acres of water) community park currently being planned for the Bridgeway Islands neighborhood. Amenities will include a boathouse and paddleboats, a rose garden, a playground and open meadow play areas. This park will also serve as the neighborhood park for this neighborhood.

NEIGHBORHOOD PARKS

Existing and proposed neighborhood parks are described in the following text, organized by neighborhood planning area (figure 1-4).

Plans are currently under review to include the total number of units with Lighthouse Marina by over 200 units.

BRYTE PLANNING AREA A2

Existing neighborhood park acreage: 0
Existing population: 6,616
Buildout population: 6,616
Existing deficiency: 13.2
Buildout deficiency: 13.2

Bryte planning area A2 contains no neighborhood parks. Because the area is built out, no opportunities exist for development of new neighborhood parks within this planning area. The existing **Bryte Park** (C1 - classified as a community park) provides for local recreation needs. Therefore, neighborhood park facilities such as children's play areas and family picnic areas should be further developed at Bryte Park, fourteen acres of which may be considered as neighborhood park.

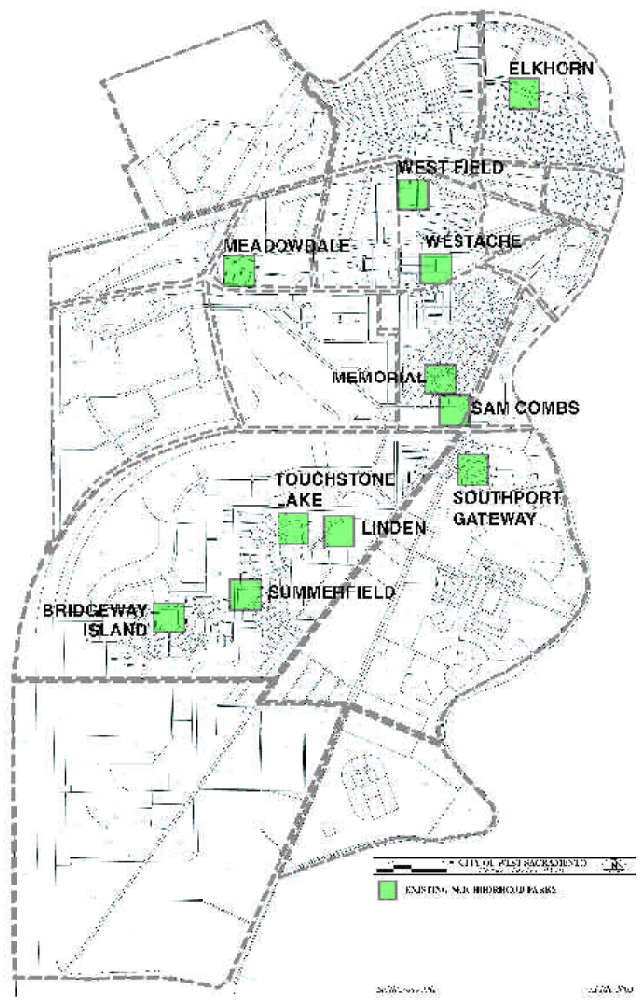


Figure 2-4: Existing Neighborhood Parks

BRODERICK PLANNING AREA B1

Existing neighborhood park acreage: 5.2
Existing population: 4,015
Buildout population: 5,990
Existing deficiency: 2.8
Buildout deficiency: 6.8

Broderick planning area B2 is served by **Elkhorn Neighborhood Park (N1)** and the **Elkhorn School fields**. At buildout, an additional 6.2 acres of neighborhood park will be required. Approximately one acre of land exists on the north side of Elkhorn School which could be leased by the City and improved to provide additional facilities such as play and picnic areas. Other opportunities for providing additional neighborhood park space are limited within this planning area.

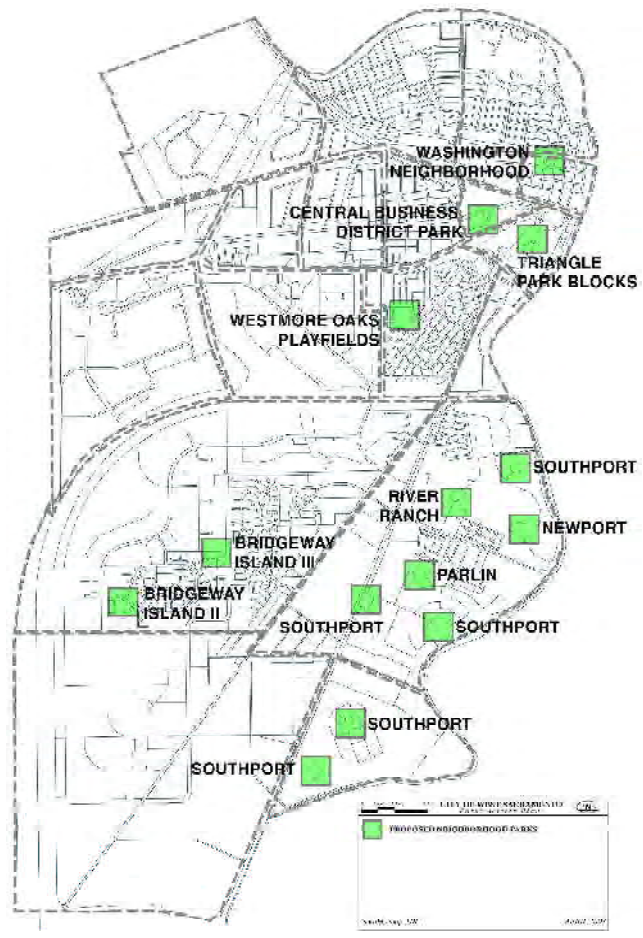


Figure 2-5: Proposed Neigborhood Parks

Extension of **River Walk Park (C3)** northward to the Broderick Boat Ramp will provide additional park space that can be used by the neighborhood. The City-owned East Riverside Property located north of the **Broderick Boat Ramp (F5)** should also be developed to include park and recreational amenities. The Washington Specific Plan proposes a new, **2.9 acre Washington Neighborhood Park (N2)** be established on the block bounded by D, E, 5th, and 6th Streets. This location, at the border of planning areas B1, B2, and B3, would be an effective place to create a new neighborhood park that would serve the Washington neighborhood. The proposed **Governors Residence (R1)**, although classified as a regional park, would provide additional park resources that would serve this neighborhood.

BRODERICK PLANNING AREA B2

Existing neighborhood park acreage:	0
Existing population:	989
Buildout population:	2,399
Existing deficiency:	2.0
Buildout deficiency:	4.8

No neighborhood parks are located within this planning area, which is not expected to grow in population beyond the approximate 1000 existing residents. The **2.9 acre Washington Neighborhood Park (N2)** proposed by the Washington Specific Plan would provide enough acreage to satisfy the demand of planning areas B2 and B3, discussed below.

Photo Credit: Gary Clements, River Walk Park

BRODERICK PLANNING AREA B3

Existing neighborhood park acreage:	0
Existing population:	270
Buildout population:	1,326
Existing deficiency:	0.5
Buildout deficiency:	2.6

No neighborhood parks are located within this planning area, which is not expected to grow in population beyond the 270 existing residents. The **2.9 acre Washington Neighborhood Park (N2)** proposed by the Washington Specific Plan would provide enough acreage to satisfy the demand of planning areas B2 and B3. The area is also served by its proximity to the **River Walk Park (C3).**

WEST SACRAMENTO PLANNING AREA C2

Existing neighborhood park acreage:	4.0
Existing population:	2,083
Buildout population:	2,083
Existing deficiency:	0.2
Buildout deficiency:	0.2

Planning area C2 is served by **Meadowdale Park (N5)**. No other opportunities exist to provide additional park acreage within this planning area.

WEST SACRAMENTO PLANNING AREA C3

Existing neighborhood park acreage:	0
Existing population:	2,800
Buildout population:	2,806
Existing deficiency:	5.6
Buildout deficiency:	5.6

Although planning area C3 contains no neighborhood parks, it is served by the **Westfield School Playfields (N3)** which is located on the border of planning areas C3 and C4. The **Westfield School Playfields (N3)** and **Westacre Playfields (N6)** together provide 11.9 acres. This total is reasonably close to the 12.6 acres required to meet the standard for planning areas C3 and C4 combined, therefore no new parks are proposed for planning areas C3 and C4.

WEST SACRAMENTO PLANNING AREA C4

Existing neighborhood park acreage:	12.0
Existing population:	3,439
Buildout population:	3,524
Existing deficiency:	(-5.0) (surplus)
Buildout deficiency:	(-5.0) (surplus)

Planning area C3 is served by the **Westfield School Playfields (N3)** and the **Westacre Playfields (N6)**, which together provide 11.9 acres. This total is reasonably close to the 12.6 acres required to meet the standard for planning areas C3 and C4 combined, therefore no new parks are proposed for planning areas C3 and C4. Open space improvements are currently being explored for the Evergreen Elementary site.

WEST SACRAMENTO PLANNING AREA C6

Existing neighborhood park acreage:	0
Existing population:	15
Buildout population:	9,221
Existing deficiency:	0
Buildout deficiency:	18.4

Summerfield Park

Planning area C6 is the "Triangle". This area is expected to develop into an urban core characterized by high and medium-density housing. The Triangle Specific Plan proposes urban park development in the form of the "**Park Blocks**" **(N7)**. The area would also be served by the extension of River Walk Park southward along the Sacramento River .

WEST SACRAMENTO PLANNING AREA C9

Existing neighborhood park acreage:	9.3
Existing population:	3,667
Buildout population:	3,667
Existing deficiency:	(-2.0) (surplus)
Buildout deficiency:	(-2.0) (surplus)

Planning area C9 is well served by **Memorial Park (N8), Circle Park (M2), Pennsylvania Park (M3), Sam Combs Park (N9),** and the facilities at **River City High School (C4).** No new parks are proposed for this area. Open space improvements are currently being explored for the Westmore Oaks Elementary School site.

SOUTHPORT PLANNING AREA D1

Existing neighborhood park acreage:	21.2
Existing population:	4,223
Buildout population:	9,725
Existing deficiency:	(-12.8) (surplus)
Buildout deficiency:	(-1.7) (surplus)

South River Road (Future Recreation Corridor)

Planning area D1 is well served by **Linden Park (N12), Touchstone Lake Park (N13), and Summerfield Park (N18).** Also located in this planning area is **Patwin Park (M4),** an undeveloped mini park that should be developed to provide access from the neighborhood to the **Main Drain Recreation Corridor (RC4)** via a pedestrian bridge that would cross the Main Drain. Additional parks planned for the Bridgeway Island neighborhood **(N16, N17, and N20)** will meet the demand for neighborhood park acreage.

The Arlington Oaks neighborhood currently has no convenient access to any park facilities because it is surrounded by barriers including Jefferson Boulevard, Lake Washington Boulevard, and the Barge Canal. Creation of a new neighborhood park within this neighborhood should be pursued, at a location to be determined.

SOUTHPORT PLANNING AREA D2

Existing neighborhood park acreage:	2.7
Existing population:	1,172
Buildout population:	18,883
Existing deficiency:	(-0.4)(surplus)
Buildout deficiency:	35.1

Planning area D2 is currently served only by **Redwood Mini Park (M5)**. When the area is built out it will be served by parks planned as part of new housing developments **(N10, N11, N15, N19, N21, and N22)**. It will also be served on its northern edge by the proposed **Central Park (CE1)** to be located on the federally-owned parcel. Other facilities planned for this area include **Recreation Corridors RC1 and RC3**, **Bee Lakes Open Space (OS2)**, and the proposed **Sports Complex (C5).**

SOUTHPORT PLANNING AREA D3

Existing neighborhood park acreage:	0
Existing population:	354
Buildout population:	3,885
Existing deficiency:	0.7
Buildout deficiency:	7.8

Planning area D3 will be served by new parks included with new subdivision development. The recently adopted Bridgeway Lakes plan includes 13.2 acres of land to be developed as one community park, Bridgeway Lakes **(C7)**. This exceeds the projected 7.8 acre demand for neighborhood park space to meet the standard. Bridgeway Lakes will also include 45.4 acres of open space, largely occupied by lake surface, which will provide additional recreational amenities.

SOUTHPORT PLANNING AREA D4

Existing neighborhood park acreage:	0
Existing population:	112
Buildout population:	5,191
Existing deficiency:	0.2
Buildout deficiency:	10.4

Planning area D4 will be served by new parks **(N23 and N24)** included with new subdivision development. In addition, a large **Community Park (C6)** proposed for this area will provide additional recreational opportunities for neighborhood residents.

MINI PARKS

West Sacramento currently has five mini parks, two of which are traffic circles, two that are undeveloped residential lots, and the Roland Hensley Bike Park located on West Capitol. Mini parks generally provide limited sitting and play areas. This can be appropriate in high density developments and in areas where larger parks are not feasible. However, development and maintenance costs are relatively high. Therefore, it is recommended that no new mini parks be developed other than the two mini parks that have already been accepted as part of the Bridgeway Lakes subdivision.

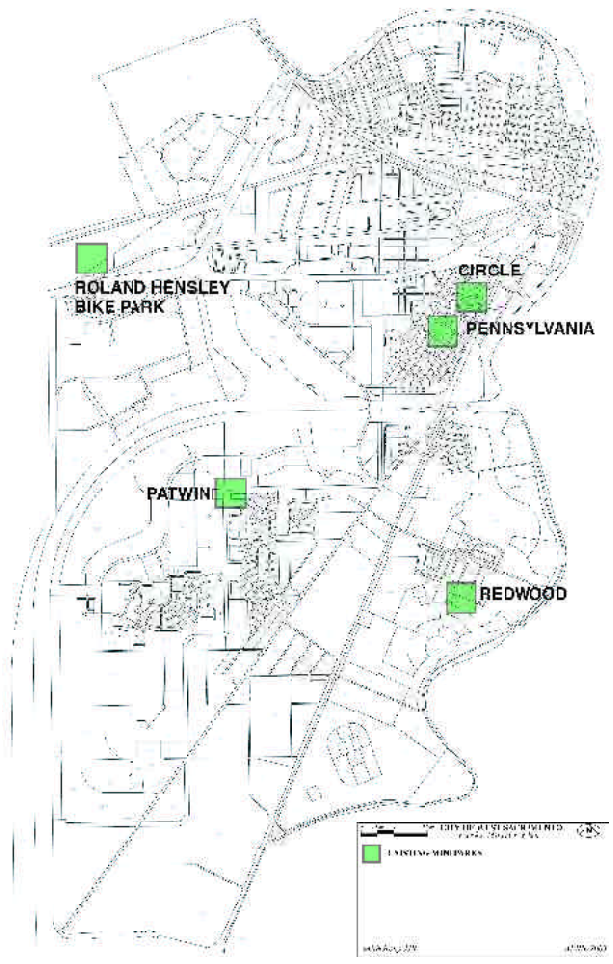


Figure 2-6: Existing Mini Parks

RECREATION CORRIDORS

Recreation corridors are proposed for the city's water edges, along a utility easement, and along a rail corridor. These corridors feature multi-purpose pathways that can be used for recreation and as alternative transportation. They can be used for walking, jogging, biking and, where appropriate, equestrian use. They also help tie the community together by linking people with their destinations such as parks, recreation facilities, schools, churches, and the workplace. The proposed recreation corridor system would create several loop routes. These loop routes are typically more enjoyable than linear pathway systems that require back-tracking. The loop routes would also be attractive to cycling races and community trail rides.

Design of the recreation corridors is organized around the multi-purpose pathway as the primary feature. Recreation corridors may also include landscaping, benches, small picnic areas, small play areas, or other recreational features. These features may be further developed where the recreation corridor forms the edge of a park, such as at the proposed Bryte Park expansion and the proposed Central Park. Formalized access to the river and other waterways should be incorporated at logical locations into the design of waterside recreation corridors.

Design standards for Recreation Corridors are contained in the Southport Design Guidelines, as revised August 5, 1998. The Southport Framework Plan also describes "through-block trails", which are minor pedestrian/bicycle linkages that feed the recreation corridors. Appendix E of this Parks Master Plan reproduces the applicable portions.

Barge Canal

Recreation Corridors are also encouraged on the west side of West Sacramento, and access to the Yolo Wildlife area is encouraged. The following corridors are proposed:

Short Line Corridor

RC1 Sacramento River/Barge Canal
13.1 miles 192 acres

This corridor would provide a continuous recreation corridor along the entire length of the Sacramento River within the City limits. The corridor shall extend from the water's edge to include the publicly owned right-of-way gifted by property owners for the existing sections of River Walk, the future extension of River Walk from the Tower Bridge south to the Pioneer Bridge and interior paths in other areas along the Sacramento Riverfront. It would link together all of the City's community parks with the exception of the proposed sports complex. The multi-purpose path will utilize the South River Road pavement once this road is replaced by a new arterial. Construction of bicycle- and pedestrian-friendly bridge crossings of the Barge Canal at Jefferson and at the proposed River Road Bridge will be critical to maintaining the continuity of the recreation corridor.

Lake Washington

RC2 Northern Easement
1.7 miles 12 acres

This corridor would occupy the existing drainage easement and extend from the railroad tracks on the north to Park Boulevard on the south. Design of the recreation corridor should be pursued in coordination with the sanitary sewer main project so that the new utility improvements do not preclude the construction of the trail. Ample space exists within the easement for construction of the sewer line and pathway. Additional neighborhood-serving amenities such as tot lots and picnic areas could be incorporated into the design of the recreation corridor. The existing open drainage ditch could be designed as an attractive feature with native vegetation and other enhancements.

RC3 Short Line Trail
3.5 miles 46 acres

A multi-purpose path would be constructed along the existing railroad corridor that extends south to Clarksburg. This corridor would be an example of the "rails-with-trails" concept. Appropriate safety measures would be incorporated into the design of the path to address the proximity of the active railroad.

RC4 Main Drain
5.8 miles 48 acres

This corridor would be constructed along the Main Drain from the barge canal on the north to the Deep water Shipping Channel on the south. It would provide convenient access for Southport neighborhoods and would become part of the loop systems. A pedestrian/bicycle bridge should be constructed over the Main Drain to connect the Bridgeway Island neighborhood with Summerfield Park.

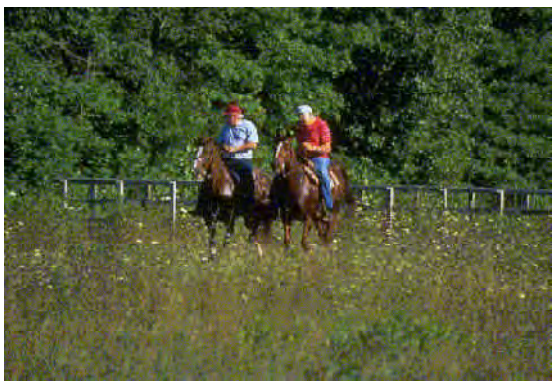
RC5 Deep Water Channel
5.3 miles 123 acres

This corridor would tie in to Recreation Corridor RC1 on the north at the barge canal, and again at the south at the southern city limits, forming a loop system. It would also connect to Recreation Corridor RC4, creating an additional loop.

Through Block Trails

The Southport Framework Plan defines Through Block Trails as "predominantly pedestrian, non-street adjacent trails that link individual neighborhoods to village centers, schools, parks, day care centers and transit stops." The plan illustrates the location of existing trails. Future trails will guided by future specific development plans subject to the review and approval of the city.

Equestrian Trails



The Southport area is undergoing transformation from rural to suburban land use. There is currently some equestrian activity in Southport. As the area is developed, accommodation should be made to allow for appropriate equestrian use of the recreation corridor system. Recreation Corridors RC1, RC3, RC4, and RC5 should be designed to incorporate equestrian trails.

Equestrian activity is more typical in rural rather than suburban areas, due to the potential conflicts that arise between equestrians, vehicles, and others in developed areas. The design of the recreation corridors in Southport would need to incorporate several key features to minimize conflicts between equestrians and other trail users. A separate riding pathway off-limits to bicycles and hikers would be necessary. Trailhead areas that provide horse trailer parking, tie-up areas, and other support facilities would also be required. The bicycle and pedestrian master plan should address in more detail equestrian trails, staging areas and include appropriate mapping.

OPEN SPACE AREAS

The Parks Master Plan includes two open space areas, the 41-acre **Turning Basin Open Space Area (OS1),** and the 23-acre **Bee Lakes Open Space Area (OS2).** These riparian and wetland areas are characterized as having significant natural resources that warrant protection and that can provide for passive recreation use. Open space area development should be limited to pedestrian-only trails (no horses, vehicles, or bicycles), interpretive facilities, and limited picnic facilities. Sensitive habitat areas should be protected by preventing human intrusion through the use of fencing, boardwalks, railings, or other design solutions.

The city also contains significant trees and groves in areas outside of the two open space areas. The city's tree preservation ordinance (chapter 8.24 of the municipal code) provides protection for all "heritage" and "significant" trees greater than 100 inches in circumference. The City may also protect any tree or grove considered worthy by designation as a "landmark tree".

SPECIAL FACILITIES

The greatest deficiency within the existing park system lies within this category. The City currently has seven special facilities: **Club West (F1),** the **Golden State Pool (F2),** the **West Sacramento Senior Center (F3),** the **Broderick Boat Ramp (F5)**, the **River City High School Pool (F6)**, the **Senior Center (F7)**, and the **Civic Center (F16)**. There are also three private special facilities that the city uses: the **Lighthouse Golf Course (F15),** the **Russian Church of Evangelical Baptists (F17)** and **Raley Field (F18)**. Lacking are community centers, high school-age teen centers, City-owned and operated swimming pools, and community gymnasiums. A freshwater aquarium on the Sacramento River is also a special facility to consider.

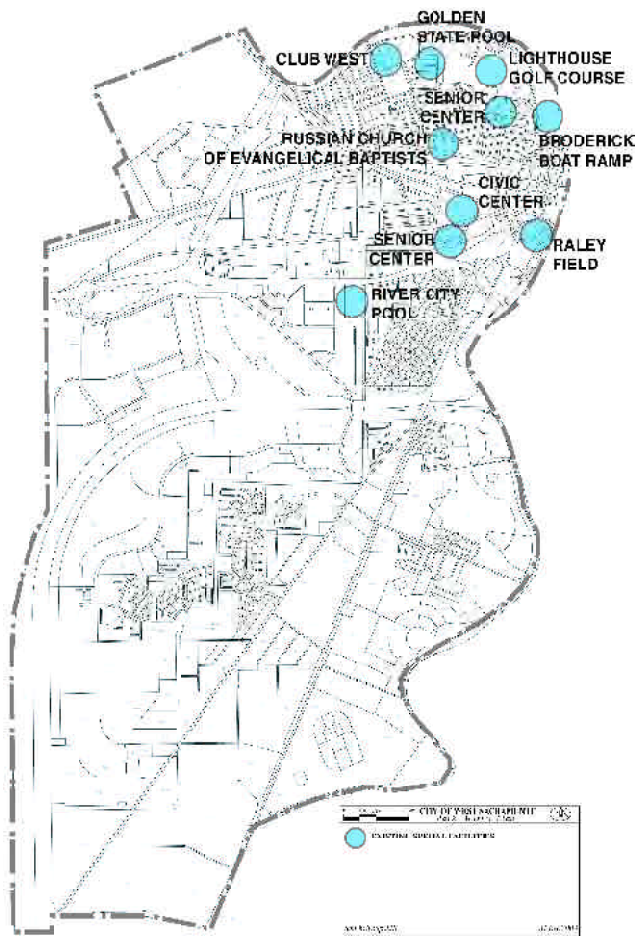


Figure 2-7: Existing Special Facilities

Community Centers

The opinion survey indicated a high demand for City-run classes and recreation programs. Currently there are no community centers that provide sufficient indoor space in which to administer the programs. Three community centers **(F4, F9,** and **F11)** would be required to serve the projected population of 77,000. One community center **(F4)** should be located in the Bryte or Broderick areas, to serve the population in the northern half of the city. A specific location for this community center has not been identified. A second community center should be constructed within the proposed **Central Park (CE1)**. This would serve both the northern and southern halves of the city. A third community center should be constructed in **Community Park (C6)** to serve the southern part of the City. Additional community facilities are included in the new **Civic Center (F16)** and joint use facilities in the **Russian Church of Evangelical Baptists (F17)**. These facilities will include large meeting rooms, classrooms and conference rooms. There is also the possibility of a community center at the former Wastewater Treatment Facility to be abandoned in 2008.

Senior Centers

West Sacramento has a significant senior population, which will continue to increase as the baby boomers age. The opinion survey indicated that senior programs are in high demand. A total of three senior centers would serve the projected population of 77,000. The existing **West Sacramento Senior Center (F3)** will be relocated to a new facility on Merkeley Ave. **Senior Center (F7)** would serve the West Sacramento community and the northern portion of Southport. **Senior Center (F13)** would serve the southern portion of the city.

Teen Centers

Activities and programs for youth were rated as very highly desirable in the opinion survey. Currently, middle school-age youth are served by **Club West (F1). Teen Center (F10)** should be constructed in the proposed **Central Park (CE1)**, and should provide for the recreation needs of both middle school- and high school-age youth. **Teen Center (F12)** should be constructed in the proposed **Community Park (C6)**, and should also provide for the recreation needs of both middle school- and high school-age youth. The City of West Sacramento is working very closely with the Frances and Chuck Collings non-profit group to construct a teen center for high school-age students on Merkeley Ave.

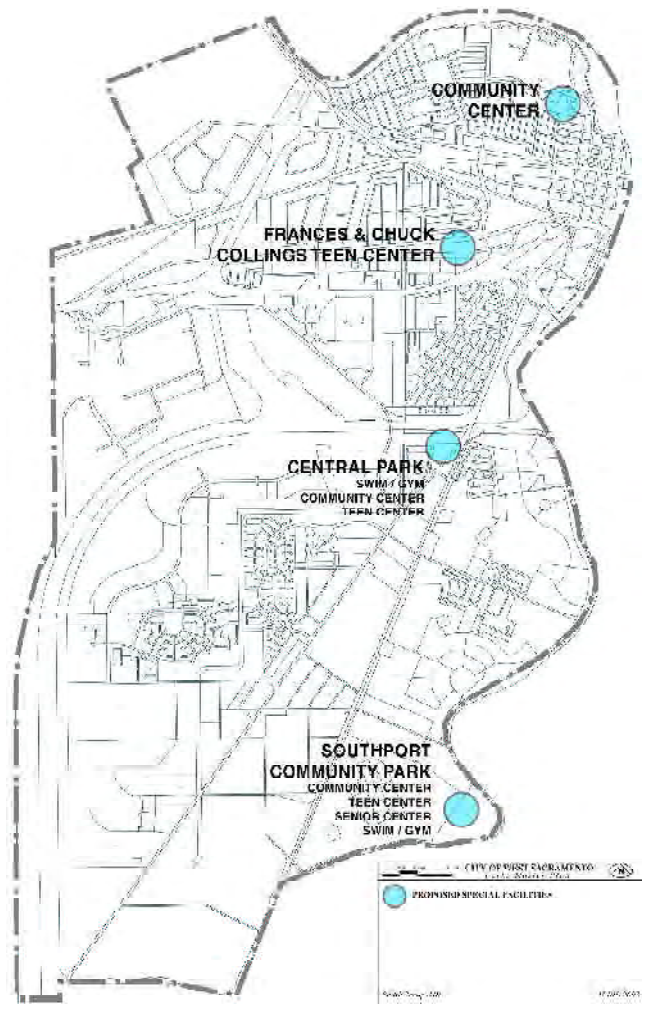


Figure 2-8: Proposed Special Facilities

Swimming Pools and Community Gymnasiums

Demand for swimming is high in West Sacramento. The general population values swimming as a recreational activity, especially in the hot summer months. Also, the local swim club engages in competitive swim meets. Two existing pools, at **Golden State Middle School (F2)** and **River City High School (F6)** are open to the public during the summer months. However, the City lacks a pool facility that is open to the public on a consistent, year round basis. The two existing pools are also not satisfactory for competitive purposes, being too shallow for modern swimming take-off techniques.

The City should make improvements to the pools at Golden State and River City schools to serve the needs of the northern half of the city. The City should also construct two new pools or pool complexes, one at Central Park **(Swim/Gym F8)** and one at the Southport Community Park **(Swim/Gym F14)**. The new pools should be indoor facilities to provide year-around recreational and competitive swimming. The combination "swim-gym" concept would make efficient use of resources and provide varied recreation opportunities. At build-out, a total of four pools would provide for the needs of the projected 77,000 population.

The gymnasium, meeting rooms, and multi-purpose room portions of the two new swim/gyms would provide facilities for recreation programs such as community basketball, gymnastics, dance, and classes.

SPORTS FACILITIES

Additional active recreation facilities should be provided within community parks, at improved school sites, and at a dedicated sports complex.

Photo Credit: James Tapia,
The Winning Run, Memorial Park

Baseball

Youth league play is currently held at **Alyce Norman/Bryte Playfields (C2),** and **Memorial Park (N8).** A total of 11 diamonds are provided. Five other diamonds exist at local school grounds. These are used for league practices and for informal play. The demand for the projected population in the northern half of the city is satisfied. In the Southport area, up to 10 new fields will be required. The community has also requested an American Legion size baseball field. These should be provided at the proposed **Central Park (CE1)**, at future schools, and the proposed **Community Park (C6)**.

Raley Field (F18) is a privately owned and operated Triple A professional baseball stadium that make available to the City of West Sacramento 20 days annually free use of the ballpark to local not-for-profit groups. They also make 1,500 ticket vouchers available to community youth every year.

Softball

Adult league play is accommodated at the two lighted fields at **Bryte Park (C1)**. At buildout, a total of 10 fields will be required. The new fields should be constructed at the dedicated **Sports Complex (C5).** Night lighting is recommended. The sports complex could attract teams from within West Sacramento and from outside the city, and could become a source of revenue for City recreation programs.

Soccer

Existing demand is met by the fields at **Summerfield Park (N18)** and **Bryte Park (C1)**. Turf areas at schools provide additional space for practice and games. Additional soccer fields should be constructed at new community parks, and at the dedicated **Sports Complex (C5)**.

Football

Demand for competitive football is generated by the high school and the Youth Tackle program. Large, multipurpose turf fields should be developed in the community parks. These fields could be used for flag football, soccer, or casual use.

Basketball

Existing courts at school sites are in substandard condition, and should be improved to satisfy current demand. New basketball courts should be included in the design of new neighborhood and community parks. New swim/gyms would provide indoor gymnasium space for basketball and other sports.

Tennis

The existing courts at **River City High School (C4)** should be reconstructed through a cooperative agreement with the Washington Unified School District. Additional courts should be constructed at **Bryte Park expansion (C1)** and at new community and neighborhood parks.

Golf

One golf course open to the public exists at the Lighthouse development. Additional public golf courses would be beneficial to meet the demand of the projected 75,000 population. Construction of new golf courses would be feasible only if a market analysis indicated that a positive economic cost/ benefit existed. New courses may be included in future residential developments in Southport. Such facilities should be made available to West Sacramento residents. It is not recommended that the City itself build new municipal courses due to the large expense of such development. Should the community place a priority on construction of a new municipal course, the City could initiate a public/private partnership with a golf course developer.

Skatepark

A skatepark should be constructed within the proposed Central Park, away from residential areas. One is being constructed in Westacre Park.

Public Safety

Future park and recreation facilities should conform to the principles of Crime Prevention Through Environmental Design or CPTED. The City of West Sacramento Police Department is highly knowledgable on this subject and should be an active participant in the park design process.

Restrooms

New parks 4-acres and greater in size should contain permanent restroom buildings.

Table 2-1: Sports Facilities Recommendations

Table 2-1 provides recommended service levels for sports facilities. In this table, existing service is compared to the national standard, and to "comparison service" (the average of the five comparison cities described in Appendix B). The comparison service levels give a picture of current levels only, rather than desired levels, because the communities have not met all of their goals.

Facility	Existing Service [1]	Comparison Service [2]	National Standard [3]	Recommended Service [4]	Existing Number	Recommended Number [5]	Additional Recommended
Regulation Softball	15,808	11,012	5,000	7,500	2	10	8
Regulation Baseball	1,976	19,774	5,000	3,000	16	26	10[7]
Regulation Soccer	5,270	5,922	10,000 [6]	5,000	6	15	9
Tennis Court	0	7,135	2,000	2,500	0	31	31
Outdoor Basketball Court	7,904	6,715	5,000	5,000	4	15	11
Volleyball Court	0	33,527	5,000	11,000	0	7	7
Swimming Pool	15,808	32,138	20,000	25,000	2	3	1[8]
Indoor Gym	0	50,572	(not given)	37,500	0	2	2
Golf Course	31,615	50,136	50,000	37,500	1	1	1

Footnotes:

1. Existing population served per each facility in West Sacramento, based on 2000 population of 31,615
2. Average population served per each facility in five comparison cities (Pleasanton, Roseville, Davis, Rocklin, and Lodi)
3. National Recreation and Park Society standard expressed in population served per each facility
4. Recommended population served per each facility
5. Based on projected population of 77,000
6. The National Standard is high relative to Western U.S. cities. 5,000 would be more appropriate.
7. Although only 10 additional baseball fields would be required to meet the 3,000 population service level, most existing fields are located on school grounds. New baseball fields should be constructed in new community parks and at the proposed sports complex to provide dedicated community facilities.
8. Although only one additional pool would be required to meet the 25,000 population service level, the two existing pools are located at public schools and therefore have limited availability for the public. Therefore, the Parks Master Plan recommends two new community swimming pool complexes to be constructed in the proposed Central Park and the proposed Southport Community Park.

NORTH RIVERFRONT AREA RECREATION PLANNING ISSUES

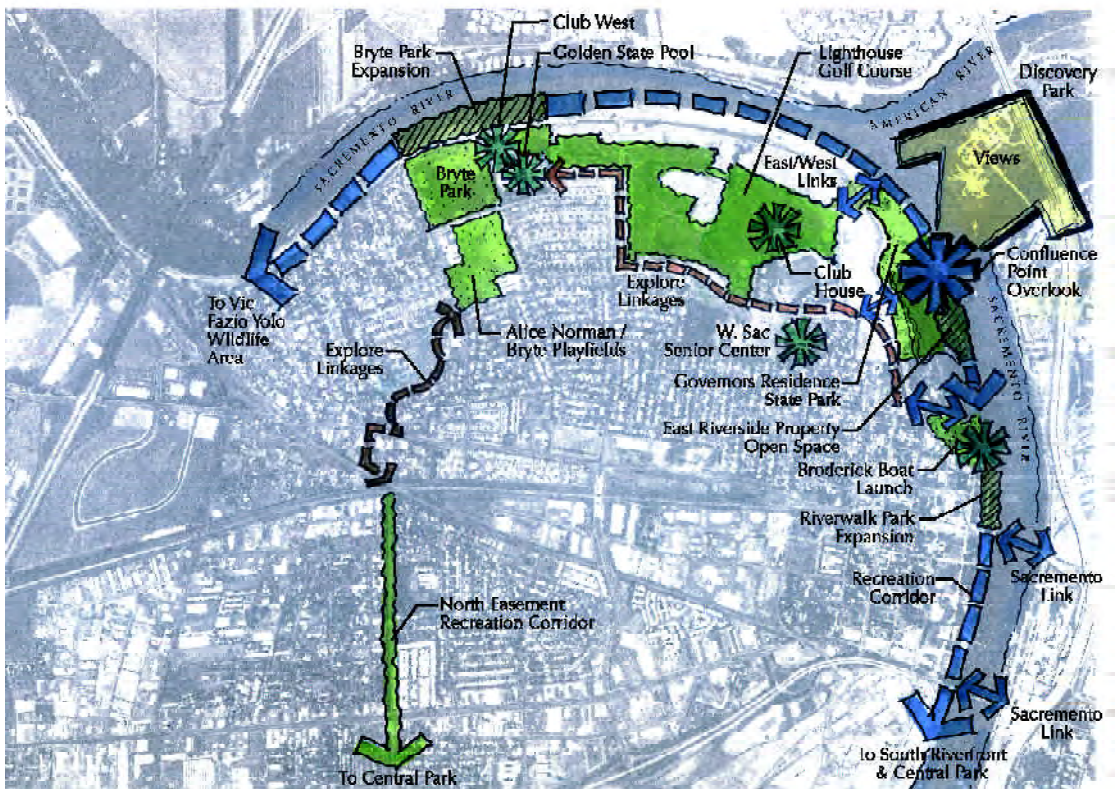
North Riverfront Recreation Cluster

The north riverfront contains a concentration of public and privately operated open space and recreational facilities that include:

- Bryte Park
- Alice Norman/Bryte Playfields
- Golden State Pool
- Governors Residence
- Lighthouse Golf Course
- Club West
- West Sacramento Senior Center

When combined with the opportunities presented by the Governors Residence State Park, the Riverfront Trail and proximity to the Sacramento-American River Confluence and Discovery Park, all the pieces are in place for a diverse and high-quality mixed-use community amenity. Efforts should be made to establish physical and programmatic linkages between these facilities to capitalize on potential synergies and the diversity of recreation and facilities that are available to residents of the surrounding neighborhoods and the city at large. In addition, efforts should be made to establish a connection to the Northern Easement (RC2) recreation corridor to connect this area into the larger park system and Central Park to the south. Figure 2-9 illustrates the potential for a north riverfront recreation cluster.

Figure 2-9: North Riverfront Recreation Center



OTHER FACILITIES OUTSIDE THE SCOPE OF THE PARKS MASTER PLAN

Community Gateways

The 1991 Parks Master Plan described a system of community gateways, landscape features that announce entry into the city. The City has developed several such gateways. Because community gateways are visual elements, similar to landscaped medians and roadway landscaping, that do not provide for any sort of recreational use, they are not parks. Therefore, they are more appropriately addressed by the City's public works landscaping programs than by the Parks Master Plan. This plan supports the continued creation of Community Gateways.

Industrial Recreation Parks

The 1991 Parks Master Plan encouraged the construction of privately-financed recreation facilities within industrial and business developments. These facilities would then be available to the general public during non-business hours. No such facilities have been developed in the ten years subsequent to adoption of the Parks Master Plan. The expectation that private corporations would construct parks that are open to the public turned out to be unrealistic. These facilities are outside the scope of the City park system, and are therefore no longer included as a priority in the Parks Master Plan.

III. Implementation Plan

III. Implementation Plan

The City of West Sacramento Parks Master Plan presents a long range vision for development of a system of park and recreation facilities that will serve an ultimate population of approximately 77,000. Implementation of this plan will require funding, design, and construction of individual projects within the framework of the City's Capital Improvement Program. This chapter outlines estimated costs, discusses funding sources, and discusses priorities for development of the park system.

Estimated Costs of Park System Development

Estimated costs for acquisition and development of the park system are presented in Table 3-1. The costs include design, construction, and inspection. All figures are in 2002 dollars. The figures include estimated costs of construction, plus design and administration at 20% of the construction cost. Projects that correct existing deficiencies are indicated in the table with an asterisk.

The following cost figures were used to develop the estimates:

Central Park	$200,000/acre
Community Parks	$150,000/acre
Neighborhood Parks	$175,000/acre
Mini Parks	$175,000/acre
Athletic Fields	$125,000/acre
Recreation Corridors	$500,000/mile
Community Centers	$4,500,000 each
Senior Centers	$2,500,000 each
Teen Centers	$2,500,000 each
Swim/Gym	$4,000,000 each
Land Acquisition	$125,000/acre

Table 3.1 Estimated Costs for Park System Development (at Buildout)

Map #	Facility Name	Size (acres)	Acquisition cost	Development cost	Total cost
Central Park					
CE1	Central Park Phase 1	30	$3,750,000	$6,000,000	$9,750,000
CE1	Central Park Phase 2	65	$8,125,000	$13,000,000	$21,125,000
CE1	Central Park Phase 3 (private)	10	$0	$0	$0
CE1	Central Park Phase 4	45	$5,625,000	$9,000,000	$14,625,000
Subtotal		150	$17,500,000	$28,000,000	$45,500,000
Community Parks					
C1	Bryte Park improvements*	11.4	$0	$500,000	$500,000
C1	Bryte Park expansion*	23	$0	$1,725,000	$1,725,000
C2	Alyce Norman/Bryte Playfields	17	$0	$0	$0
C3	River Walk Park	4	$0	$0	$0
C4	River City High School*	22	$0	$2,750,000	$2,750,000
C5	Sports Complex	50	$6,250,000	$6,250,000	$12,500,000
C6	Southport Community Park	50	$6,250,000	$7,500,000	$13,750,000
C7	Bridgeway Lakes Community Park	41.5	$5,187,500	$6,225,000	$11,412,500
Subtotal			$17,687,500	$24,950,000	$42,637,500

Map #	Facility Name	Size (acres)	Acquisition cost	Development cost	Total cost
Neighborhood Parks					
N1	Elkhorn Park/Elkhorn School*	5.2	$0	$100,000	$100,000
N2	Washington Neighborhood Park*	2.9	$362,500	$507,500	$869,700
N3	Westfield School Playfields	7.0	$0	$0	$0
N4	Central Business District Park*	2.3	$287,500	$402,500	$690,000
N5	Meadowdale Park*	4.0	$0	$100,000	$100,000
N6	Westacre Playfields*	5.0	$0	$100,000	$100,000
N7	Triangle Park Blocks	7.0	$875,000	$1,225,000	$2,100,000
N8	Memorial Park*	4.0	$0	$100,000	$100,000
N9	Sam Combs Park*	4.5	$0	$100,000	$100,000
N10	Southport Gateway Neighborhood Park	2.2	$0	$0	$0
N11	Southport Neighborhood Park	3.3	$412,500	$577,500	$990,000
N12	Linden Park*	4.0	$0	$100,000	$100,000
N13	Touchstone Lake Park*	4.0	$0	$100,000	$100,000
N14	River Ranch Neighborhood Park	1.5	$187,500	$375,000	$562,500
N15	Newport Neighborhood Park	12.5	$1,562,500	$2,187,500	$3,750,000
N16	Bridgeway Island Neighborhood Park	4.1	$0	$0	$0
N17	Bridgeway Island III Neighborhood Park	4.3	$537,500	$752,500	$1,290,000
N18	Summerfield Park*	8.9	$0	$100,000	$100,000
N19	Parlin Neighborhood Park	4.5	$562,500	$787,500	$1,350,000
N20	Bridgeway Island II Neighborhood Park	6.1	$762,500	$1,067,500	$1,830,000
N21	Southport Neighborhood Park	18.7	$2,337,500	$3,272,500	$5,610,000
N22	Southport Neighborhood Park	10.8	$1,350,000	$1,890,000	$3,240,000
N23	Southport Neighborhood Park	15.3	$1,912,500	$2,677,500	$4,590,000
N24	Southport Neighborhood Park	5.1	$637,500	$637,500	$1,530,000
N25	Westmore Oaks Playfield*	4.0	$0	$700,000	$700,000
Subtotal			$11,787,500	$17,860,000	$29,902,200
Mini Parks					
M1	Roland Hensley Bike Park	0.5	$0	$0	$0
M2	Circle Park*	0.3	$0	$50,000	$50,000
M3	Pennsylvania Park*	0.5	$0	$50,000	$50,000
M4	Patwin Park*	0.2	$0	$100,000	$100,000
M5	Redwood Park*	0.5	$0	$100,000	$100,000
M6	Pheasant Hollow Park	0.5	$62,500	$87,500	$150,000
Subtotal			$62,500	$387,500	$450,000
Open Space Areas					
OS1	Turning Basin Riparian Area	41	$0	$450,000	$450,000
OS2	Bee Lakes	23	$0	$350,000	$350,000
Subtotal			$0	$800,000	$800,000
Recreation Corridors					
RC1	Sacramento River/Barge Canal (13.1 mi.)	192	$0	$6,550,000	$6,550,000
RC2	Northern Easement (1.7 mi.)	12	$0	$850,000	$850,000
RC3	Short Line Trail (3.5 mi.)	21	$2,625,000	$1,750,000	$4,375,000
RC4	Main Drain (5.8 mi.)	48	$0	$2,900,000	$2,900,000
RC5	Shipping Channel (5.3 mi.)	123	$0	$2,650,000	$2,650,000
Subtotal			$2,625,000	$14,700,000	$17,325,000

Map #	Facility Name	Size	Acquisition	Development	Total
Special Facilities		**(acres)**	**cost**	**cost**	**cost**
F1	Club West		$0	$0	$0
F2	Golden State Pool		$0	$0	$0
F3	West Sacramento Senior Center		$0	$0	$0
F4	Community Center*	1	$125,000	$4,500,000	$4,625,000
F5	Broderick Boat Ramp	4	$0	$0	$0
F6	River City Pool*		$0	$1,000,000	$1,000,000
F7	Senior Center		$0	$2,500,000	$2,500,000
F8	Central Park Swim/Gym		$0	$4,000,000	$4,000,000
F9	Central Park Community Center		$0	$4,500,000	$4,500,000
F10	Central Park High School Teen Center		$0	$2,500,000	$2,500,000
F11	Southport Community Center		$0	$4,500,000	$4,500,000
F12	Southport High School Teen Center		$0	$2,500,000	$2,500,000
F13	Southport Senior Center		$0	$2,500,000	$2,500,000
F14	Southport Swim/Gym		$0	$4,000,000	$4,000,000
F15	Lighthouse Golf Course		$0	$0	$0
F16	Civic Center		$0	$0	$0
F17	Russian Church of Evangelical Baptists		$0	$0	$0
F18	Raley Field		$0	$0	$0
F19	Frances and Chuck Collings Teen Center		$0	$0	$0
Subtotal			$125,000	$32,500,000	$32,625,000

Summary of Costs for Buildout

Category	Acquisition	Development	Total
Central Park	$17,500,000	$28,000,000	$45,500,000
Community Parks	$17,687,500	$24,950,000	$42,637,500
Neighborhood Parks	$11,787,500	$17,860,000	$29,902,200
Mini Parks	$62,500	$387,500	$450,000
Open Space Areas	$0	$800,000	$800,000
Recreation Corridors	$2,625,000	$14,700,000	$17,325,000
Special Facilities	$125,000	$32,500,000	$32,625,000
Total	**$49,787,500**	**$119,197,500**	**$169,239,700**

FINANCING

This section contains the City's policies for financing acquisition and development of park land and recreation facilities. These policies address the financing of parks, recreation facilities, and special facilities, such as an indoor swimming and gymnasium facility, a cultural arts facility, and community centers. The park fee also funds recreation corridor land acquisition and development.

The Master Plan establishes the relationship, or nexus, between new residents and the provision of new park and recreation improvements.

Major Conclusions

The City's parks constitute a citywide system. Residents travel widely within the City to use various parks and recreation facilities.

- This Master Plan includes an acreage standard for park acquisition and standards and guidelines for park development. The standards are expressed in terms of acres of parkland to serve the residential population. In addition, local parks provide recreation opportunites that serve employees and patrons of local businesses, many of which are non-residents.

- Special facilities, including community centers, an indoor swimming and gymnasium facility, or community center, are most appropriately financed by city-wide mechanisms or external funding sources and not by development impact fees.

- State and federal grants, gifts, and bequests, and other external sources of funds will, to the maximum extent possible, be sought to finance special facilities. These sources shall also be used to acquire land to meet the City's goal of 5.0 acres per 1,000 residents, relative to the existing population.

Public Finance Considerations

Like most municipalities in California, the City of West Sacramento is under substantial fiscal pressure due to limits on property taxes (Proposition 13), the economic slowdown in California, state and federal cutbacks in local grant programs, and recent pressures at the state level to reduce local revenues.

The ability of local governments in California to finance public improvements has been increasingly circumscribed over the last 25 years. In June 1978, the voters of California amended the state constitution to limit the ability of local governments to impose property taxes. That amendment, commonly known as Proposition 13, added Article XIIIA to the state constitution, which limits the maximum ad valorem tax on real property to one percent of the assessed value of that property. Proposition 13 also limited annual assessed value increases to 2 percent or the inflation rate, whichever is smaller, until a property is sold.

Since the passage of Proposition 13, more than a dozen other statewide propositions have been passed that restrict how local revenues can be raised or spent. While many measures were passed during the late 1980's and early 1990's, the measure that has had the most widespread impact since Proposition 13 was passed in 1996 as Proposition 218. This measure adds Articles XIIIC and XIIID to the state constitution. Proposition 218 does the following:

- Limits authority of local governments to impose taxes and property-related assessments, fees and charges, requires that a majority of voters approve increases in general taxes and reiterates that two-thirds must approve a special tax;

- Requires that assessments, fees, and charges must be submitted to property owners for approval or rejection, after notice and public hearing;

- Limits the amount of an assessment on a property to the "special benefit" that is conferred on the property;

- Limits fees and charges to the cost of providing the service and establishes that such fees and charges may not be imposed for general governmental services that are generally available to the public.

Development-Related Financing

In response to the new fiscal realities heralded by Proposition 13, local governments in California have increasingly turned to various forms of development-related financing to provide the public improvements required to serve new development. In return for the right to develop property, a

developer provides land, improvements, and/or fees required to provide services to the new residents who will live in the new development.

Section 66000 (et seq.) of the State of California Government Code establishes a demanding set of requirements for development impact fees. This section of the Government code (enacted as AB 1600) requires a local agency that establishes, increases, or imposes a development impact fee as a condition of development after 1 January 1989 to do the following:

- Identify the fee's purpose.
- Identify the fee's uses.
- Establish a reasonable relationship between the fee's use and the type of development project on which the fee is imposed.
- Determine whether there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is imposed.

Current Funding Mechanisms

The City of West Sacramento has adopted fee requirements for parks and recreation improvements under its general authority over land use, codified by AB 1600. These fees apply to both subdivided and non-subdivided residential land, as well as to commercial and industrial development. The fees can be used for land acquisition and development. All new development pays a development impact fee for development of parks and recreation facilities.

Exactions from new development can only be used to fund the acquisition and development of parks and recreation improvements that are acquired or constructed to serve new residential development. Any new park or recreation improvement needed to serve existing residents (to satisfy the "existing deficiency") must be funded from sources other than future development impact fees.

Development Impact Fees Collected from Future Development

These funds can only be used to pay for park land and recreation facility needs created by new residents. They cannot be used to rectify deficiencies in park land or facilities existing at the time of fee adoption. However, a portion of the fees could be used for improvements to existing parks which expand the recreation capacity of the parks and recreation facilities for the new residents.

Development impact fees are the City's primary source of funds dedicated for acquisition of park land and development of facilities. Currently, these fees are based on an average land cost for the entire city. Park land may be more (or less) expensive than this average figure. Therefore, the actual number of acres which could be purchased with development impact fees may be less than (or greater than) assumed by the development impact fee. Upon adoption of the Master Plan, the City will undertake an update of development impact fees for parks and recreation facilities. This update will include an analysis of the current average cost for acquisition of park land.

The update of the impact fees will be based on the analysis of the costs of development of parks, based upon the park standards contained in the Master Plan. This will allow the City to project the costs of park development related to additional population growth, and to examine the ability of the fees to achieve the standards of the Master Plan. This review is important for responsible decision-making regarding the quality of the parks system currently enjoyed by West Sacramento residents. This review will also ensure that future residents bear their fair share of the costs for the parks and recreation system.

The park development impact fees as of this writing are as follows:

- Single family residence	$5,282 per unit
- Multi family residence	$4,331 per unit
- Commercial space	$0.459 per square foot
- Office space	$0.742 per square foot
- Industrial space	$0.318 per square foot

Applying these fees to the current buildout projections yields a total estimated revenue of $. The fee update is necessary to ensure that future development pays its fair share of park system development costs.

Acquisition and Development of Special Facilities

Special facilities tend to be unique and are relatively expensive to develop. An indoor swimming and gymnasium facility, a cultural arts facility, and new community centers, all of which have been discussed in West Sacramento over the years, are examples of special facilities.

The development of special facilities, while not a standard, is a goal of the City. As such, special facilities do not contribute to the City's standard of 5.0 acres per 1,000 new residents. Only that portion of special facilities required to serve new development may be financed with development impact fees. Therefore, the City will seek broad-based mechanisms to finance the land acquisition and development of such facilities. State and federal grant monies, gifts, bequests, city-wide sources, and other external sources of monies will, to the maximum extent possible, be used to fund such facilities. The City will pursue such external funding sources as opportunities arise.

The City will also explore public-private cooperative mechanisms, such as public ownership coupled with private operation. In the future, the City may wish to consider using revenues from development impact fees to finance some portion of the cost of special facilities. In order for this to occur, a financing plan providing for the current community's funding obligation for such facilities would need to be prepared.

Resident's Willingness to Pay for Parks and Recreation Facilities

In addition to federal and state grant programs, gifts and bequests, and public-private cooperative mechanisms, there are several ways to fund special facilities. Such mechanisms include special

benefit assessments (e.g. Landscape and Lighting Districts), General Obligation bonds, general taxes (such as utility taxes) and special taxes earmarked by the City Council for parks and recreation purposes. While requirements for voter approval vary among such mechanisms, strong resident support will be required for such new funding sources.

The Master Plan makes no recommendation about new taxes or assessments for recreation facilities at this time.

Potential Funding Sources for Facilities to Serve Existing Development

This section describes the funding sources that could be used to finance the acquisition and development of special facilities and other park improvements to serve existing development in West Sacramento.

Federal and State Grants

Given the difficulties in locally financing costly public improvements that were discussed earlier, a preferred approach where feasible is to use external grant funding. State and Federal grants have historically provided important sources of funding for park and recreation improvements. However, under current economic conditions, they cannot be relied upon for substantial on-going resources.

General Revenues

General revenues are revenues that the city receives that may be used for any valid municipal purpose. General revenues flow into the General Fund. The General Fund covers the cost of most on-going municipal services such as police and fire services and general governmental services. The largest municipal general revenue sources are sales taxes and property taxes. Budget surpluses and reserves, if available, could provide some funds for park improvements.

Without substantial new general revenues, relatively few California municipalities are in a position to make substantial on-going commitments to pay for major capital improvements from the General Fund. However, with majority voter approval, municipalities can increase or impose certain new general taxes such as a ½ cent sales tax override.

General Obligation Bonds (GO bonds).

General Obligation (GO) bonds may be issued by cities, counties and certain other local government entities to finance specific projects. Debt service for GO bonds is provided by an earmarked property tax above the one percent general property tax mandated by Proposition 13 (often called a “property tax override”). These overrides typically show up on the annual tax bill as “voted indebtedness”. The proceeds from GO bonds can be used to finance the acquisition, construction and improvement of real property, but cannot be used to pay for equipment, supplies, operations or maintenance costs. GO bonds require a 2/3 majority vote by registered voters.

Gifts and Bequests

Contributions from private individuals and businesses are an attractive source of financing. They are normally accompanied by some gesture of recognition to the donor. Although fundraising through donations is unpredictable, it can provide a useful supplement to other sources of finance.

Special Benefit Assessment

Special Benefit assessments can be levied on real property by municipalities, counties and special districts to acquire, construct, operate and maintain public improvements which convey an identifiable special benefit to the defined properties. Prior to issuing bonds, the City Council would conduct a set of proceedings to establish the scope and cost of the improvements to be financed, identify the land parcels that are benefited, determine a fair and equitable allocation of the costs to the benefitted parcels, and conduct a landowner approval process.

Proposition 218 establishes a strict requirement for formal landowner approval before such assessments can be put in place. Each landowner votes in proportion to the amount of any assessment that would be levied on his or her property. The assessment must be approved by a simple majority of the weighted ballots cast. Under Proposition 218, public properties are treated the same as private properties in a benefit assessment.

Landscaping and Lighting Maintenance Districts

The Landscaping and Lighting Act of 1972 (and amended in 1984) provides for local governments (cities, counties and certain special districts) to raise funds for developing, maintaining and servicing public landscaping and lighting facilities. Public landscaping and lighting can include parks, recreation and open space acquisition and improvement, landscaping, street lighting, sidewalks, curbs and gutters. The revenue to pay for these facilities comes from special assessments levied against the benefitted properties. The establishment of the assessment is subject to the requirements of Proposition 218, and the assessment is collected as a separate item on the annual property tax bill.

Special Tax

The Mello-Roos Community Facilities Act permits various local governments to establish a Community Facilities District (CFD) to finance new facilities and/or to pay for operations and maintenance through the levying of a special tax. The Act (as well as Proposition 218 discussed earlier) requires a two-thirds vote for approving the special tax.

Redevelopment Tax Increment

A California city or county can establish a redevelopment agency to undertake the revitalization of an area that it finds to be “blighted”. The redevelopment agency can incur indebtedness to finance improvements needed to accomplish the goals of its redevelopment plan. The property tax base in the redevelopment area is “frozen”, and increments in property taxes after the tax base is frozen go into the redevelopment fund to be used for the financing of improvements. Voter approval is not required for tax increment financing. Such financing can be used only for improvements to support the needs of redevelopment.

Business Improvement Districts

There are two types of Business Improvement Districts authorized under California law. Each is authorized under a separate law.

Under the *Parking and Business Improvement Law of 1989*, a BID can be established and business owners can be assessed to pay for a limited range of improvements and services. These eligible improvements and services include parking facilities, parks, benches, fountains, street lighting, promo-

tion of public events, promotion of tourism, and music in public places.

Under the *Property and Business Improvement District Law of 1994*, a BID can be created and a special benefit assessment can be levied against real property to finance a variety of downtown improvements. Districts created under this law are often referred to as "property-based business improvement districts" (or PBIDs).
Since neither type of district is authorized to issue bonds, BIDs are more appropriately used to pay for on-going services than for large capital improvements. BIDs established under the 1989 law must be reestablished annually while PBIDs can be established for up to five years. Hence, they are not, in general, appropriate for financing large, long-term improvements.

Operation and Maintenance

Historically, West Sacramento's General Fund has provided the primary support for the maintenance of parks and supervision of parks and recreation buildings. The General Fund will continue to fund operations and maintenance of West Sacramento's park facilities.

Priorities

Implementation of the Master Plan proposals will be carried out by the City's professional staff through the Capital Improvement Program process. Projects to be implemented in a given year will be prioritized and matched with available funding. The recommendations of this Master Plan are based on the community's expression of demand for services. In general, the most significant priorities include:

- Central Park
- Aquatics facilities
- Facilities for classes such as would be available in a community center
- Facilities and programs for seniors such as would be contained in a senior center
- Large community parks that provide a wide range of activities for all age groups in an integrated setting
- Improved water access for fishing and boating
- Facilities for youth sports
- Programs for youth
- Recreation corridors

Appendix

Appendix A: Existing Conditions Analysis

Development of West Sacramento's Park System

Prior to the establishment of the East Yolo Community Services District in 1976, provision of park and recreation services was limited to efforts by local schools and private clubs. Sam Combs Park, Memorial Park, and the Pennsylvania Street traffic circle were the only developed parks at that time.

In 1977, the East Yolo Community Services District prepared a park master plan to cover the period from 1977 to 1987. The plan addressed the need for neighborhood parks, joint use of school property, river access, bicycle trails, and other recreation services. Many of the plan's goals were achieved, particularly with regard to neighborhood parks and school ground improvements. These achievements included Bryte Park, Elkhorn Park, Circle Park, Linden Park, Meadowdale Park, Touchstone Lake Park, and Redwood Park.

In 1987 the City of West Sacramento was incorporated, and the Department of Parks and Community Services established. During the next few years, the City improved the Westfield School Playfield, constructed the Westacre Playfield Site park improvements, and installed turf at the Summerfield Park site.

In 1991, the City prepared its first long-range park system master plan. Implementation of the improvements described by the plan was hampered by the economic recession of the early 1990's. During the middle and late 1990's, many achievements occurred. Nine youth sports fields were constructed at the Alyce Norman/Bryte Elementary School site. Two soccer fields, basketball courts, a dog run, and a children's play area were installed at Summerfield Park. The Broderick Boat Ramp area was upgraded. Most recently, the first phase of the River Walk Park was implemented, providing the City with a significant community park resource. Raley Field, a privately funded minor league baseball stadium, opened in 2001.

The existing park and recreation system is illustrated in figures 2-2, 2-3, 2-5.

City-School District Agreements

The City and the Washington Unified School District have enjoyed a cooperative arrangement through joint use agreements that allow the City to construct improvements and maintain portions of local school grounds and facilities. The joint use agreements directly benefit the community by facilitating use of school recreation facilities by the general public at certain times. For example, the pools at Golden State Middle School and River City High school are available to the public during the summer months. Capital improvements made by the City have included turfed playfields at the Westfield School site, and development of the Alyce Norman/Bryte youth sports complex.

Park Acreage and Standards

West Sacramento contains approximately 101 acres of developed parkland. Based on a current estimated population of 34,000, this equals 3.0 acres for every 1,000 residents. This figure includes community, neighborhood, and mini parks, but excludes specialized areas such as open space, golf courses, marinas, and wildlife areas. It also excludes school property that is not maintained by the City and that is not typically available for general community use.

This figure provides a measure of the City-controlled area available for traditional recreation pursuits. This measure is also useful in comparison with similar statistics available from other cities. The 1991 Parks Master Plan established a goal of 5 acres per 1000 residents, broken down into 3 acres of community parks and 2 acres of neighborhood parks.

Table A-1: Current Acreage Deficiencies

CURRENT ACREAGE DEFICIENCIES 34,000 population	Standard acres/1000	Acres Required	Existing Acreage	Existing Deficiency
Neighborhood Parks	2	68	55.4	12.6 acres
Community Parks	3	102	46.0	56.0 acres
Total Park Acreage	5	170	101.4	68.6 acres

For comparative purposes, the table below presents the acreage deficiencies at the time of the 1991 Parks Master Plan.

Table A-2: 1991 Acreage Deficiencies

1991 ACREAGE DEFICIENCIES 28,869 population	Standard acres/1000	Acres Required	1991 Acreage	1991 Deficiency
Neighborhood Parks	2	57.7	44.8	12.9 acres
Community Parks	3	86.6	23.4	63.2 acres
Total Park Acreage	5	144.3	68.2	76.1 acres

"Buildout" refers to the population expected to occupy the city once all planned residential development has been completed. The acreage required at buildout is presented in the table below:

Table A-3: Required Buildout Acreage

REQUIRED BUILDOUT ACREAGE 77,000 population	Standard acres/1000	Acres Required	Existing Acreage	Additional Acreage Needed
Neighborhood Parks	2	154	55.4	98.6 acres
Community Parks	3	231	46.0	185 acres
Total Park Acreage	5	385	101.4	283.6 acres

School grounds can also provide recreational open space that is available to the public on a limited basis. For example, youth sports leagues utilize school fields in many communities, and school pools are often open to the public when school is not in session. The West Sacramento public schools

contain approximately 63 acres of turf fields and hardcourt play areas. When this figure is added to the City's supply (101.4 acres existing), the service level rises from 3.0 to 4.8 acres per 1000 residents, based on a current population of 34,000.

In the older portions of West Sacramento, the school system has historically played an important part in the City's ability to provide recreation services. Looking forward, the public school grounds will continue to be important sources of recreation land for the communities of Bryte, Broderick, and West Sacramento.

Neighborhood Planning Areas

Provision of adequate park space within walking distance of community residents is a fundamental goal of park planning. The Parks Master Plan organizes the community into defined neighborhood planning areas (Figure 2-2) for the purpose of analyzing the neighborhood and mini park acreage available to residents within each neighborhood planing area. The planning areas also make possible the forecasting of population on a neighborhood by neighborhood basis, which is necessary for planning the amount of park acreage required within each neighborhood.

The planning areas defined in the 2001 Parks Master Plan are similar to those in the 1991 plan with the following modifications:

- The Broderick neighborhood has been reunited into one planning area
- The portion of West Sacramento located between highway 80 and the railroad grade have been reorganized to provide a better fit with the available census data and the emerging central business district.
- The organization of Southport reflects the four villages of the Southport Framework Plan.

A neighborhood is defined by many factors, including subdivision development patterns, topography, and vehicular circulation. An idealized neighborhood would be a contiguous area free of significant barriers to pedestrian movement that contains a population of up to 5000 people. The four Southport Villages will each exceed 5000 population. The Southport Framework Plan has identified smaller neighborhood areas within each of these four villages.

Table A-4 on the following page provides an analysis of neighborhood and mini park acreage provided within each neighborhood planning area.

TableA-4: Neighborhood Park Acreage Requirements (by planning area)

Neighborhood Planning Area	Existing Acreage	Existing Deficiencies			2025 Requirements		
		2000 Population	Total Acreage Required 2000	Existing Deficiency in Year 2000	2025 Population	Total Acreage Required 2025	Additional Acreage Required 2025
Bryte							
A1	0	155	0.3	0.3	155	0.3	0.3
A2	0	6,616	13.2	13.2	6,616	13.2	13.2
Broderick							
B1	5.2	4,015	8.0	2.8	5,990	12.0	6.8
B2	0	989	2.0	2.0	2,399	4.8	4.8
B3	0	270	0.5	0.5	1,326	2.6	2.6
West							
C1	1.0	0	0	(-1.0)	0	0	(-1.0)
C2	4.0	2,083	4.2	0.2	2,083	4.2	0.2
C3	0	2,800	5.6	5.6	2,806	5.6	5.6
C4	12.0	3,439	7.0	(-5.0)	3,524	7.0	(-5.0)
C5	0	459	0.9	0.9	459	0.9	0.9
C6	0	15	0	0	9,221	18.4	18.4
C7	0	334	0.7	0.7	334	0.7	0.7
C8	0	51	0.1	0.1	51	0.1	0.1
C9	9.3	3,667	7.3	(-2.0)	3,667	7.3	(-2.0)
C10	0	2	0	0	2	0	0
Southport							
D1	21.2	4,223	8.4	(-12.8)	9,725	19.5	(-1.7)
D2	2.7	1,172	2.3	(-0.4)	18,883	37.8	35.1
D3	0	354	0.7	0.7	3,885	7.8	7.8
D4	0	112	0.2	0.2	5,191	10.4	10.4
TOTAL	**55.4**	**30,756**	**61.4**	**6**	**76,317**	**152.6**	**97.9**

Footnote:
Population figures are based on the 2000 census and projected year 2025 population as forecast by SACOG, with amendments to reflect the Washington Specific Plan and West Capitol Action Plan.

Proximity to Local Parks

Most residential areas of the City are located within walking distance of a local park. Figure 2-3 illustrates those areas that lie within one-half mile of a park (approximately a ten-minute walk).

Distribution of Parks and Parkland Acreage within Neighborhoods

Parks and school grounds are distributed throughout the City. While some neighborhoods are better served than others, almost every neighborhood has access to a local park or school ground. Planning areas that contain no city parks include area A1 in Bryte, area B2 in Broderick, areas C3, C5, C6, C7, and C10 in West Sacramento; and areas D3 and D4 in Southport. Most of these planning areas arecommercial, industrial, or undeveloped portions of the City that contain no or few residents. A discussion of the availability of parks in each neighborhood planning area follows:

Figure A-1: Park Service Areas

Bryte

A1 is not a residential area.
A2 contains a population of 6616. It is served by Bryte Park and the Alyce Norman/Bryte Playfields, but does not contain a neighborhood park.

Broderick

B1 has a population of 4,015, with an estimated buildout of 5,638. It is served by Elkhorn Neighborhood Park.
B2 has no parks, and is comprised of the Central Business District.
B3 has access to the River Walk Park.

West Sacramento

C1, C5, C7, C8, and C10 do not contain significant residential populations.
C2 is served by Meadowdale Park.
C3 has no parks within its area. However, the Westfield School Playfields are located on the area's eastern border.
C4 is served by the Westfield School Playfields and the Westacre Playfield.
C6 is expected to experience dramatic residential growth as the Triangle Specific Plan is implemented.
C9 is served by Memorial, Pennsylvania, Circle, and Sam Combs Parks

Southport

D1 is served by Linden, Touchstone Lake, and Summerfield Parks, and the future parks in the Bridgeway Island project.
D2 currently contains only Redwood Mini Park.
D3 and D4 are largely undeveloped.

Sports Facilities

Table A-5 provides a comparison of sports facilities in West Sacramento and other comparable communities.

Table A-5: Sports Facilities Comparison

	West Sacramento	Davis	Redding	Rocklin	Roseville	Pleasanton	Lodi
Population (2000 census)	**31,615**	60,308	80,864	36,330	79,929	63,654	56,999
Facility	**# (Service)** *1*	# (Service)	# (Service)	# (Service)	# (Service)	# (Service)	# (Service)
Regulation Softball *2*	**2 (15,808)**	6 (10,051)		1 (36,330)	18 *6* (4,440)	15 (4,243)	3 (18,999)
Regulation Baseball *3*	**16 (1,976)**	2 (30,154)		11 (3,302)		16 (3,978)	1 (56,999)
Regulation Soccer	**6 (5,270)**	9 (6,700)		6 (6,055)	6 (13,321)	18 (3,535)	0
Tennis Court	**0**	32 (1,884)	6 (13,477)	3 (12,110)	6 (13,321)	20 (3,182)	11 (5,181)
Outdoor Basketball Court *4*	**4 (7,904)**	6 (10,051)		6 (6,055)	13 (6,148)	20 (3,182)	7 (8,143)
Volleyball Court	**0**	3 (20.102)	0	2 (18,165)	1 (79,929)	4 (15,912)	
Swimming Pool	**2 (15,808)**	4 (15,077)	2 (40,432)	1 (36,330)	3 (26,643)	1 *7* (63,645)	3 (18,999)
Indoor Gym *5*	**0**	0		0	1 (79,929)	3 (21,215)	
Public Golf Course	**0**	1 (60,308)	0	0	2 (39,965)	0	0

Footnotes:

1. # = total number provided; (service) = total population served per each facility, based on 2000 census population
2. Adult softball
3. Includes adult baseball, boy's baseball, and girl's softball fields; does not include practice fields
4. Includes courts in city parks only
5. Includes city facilities only
6. Roseville utilizes a "multipurpose" field approach that can be used for youth and adults softball and baseball
7. Four pools located at one swim complex

Park Classification System

The West Sacramento park system is composed of seven main types of parks and recreational facilities, each with a distinct function:

Regional Parks
A regional park is a large park, typically organized around a significant geographical feature such as a lake, mountain, forest or coastline, and that serves several communities within a one hour driving time. Regional parks are typically administered by the state, counties, or other park agencies rather than municipalities due to their large size and unique nature. However, regional usage of local parks is common. Residents of West Sacramento utilize park facilities in Sacramento and other communities. West Sacramento experiences usage in its parks by residents of other communities as well, especially at Bryte Park and the Broderick Boat Ramp, as well as along the Sacramento River, Turning Basin, and Yolo Bypass.

Central Park
A central park is a large, unique park that serves the entire city. A central park is essentially a community park that has an elevated status due to its central location, unique features, historic characteristics, or great size. Central parks typically contain a wide variety of active and passive recreational facilities, and may contain unique features such as zoos, aquariums, museums, water-front access, or other features.

West Sacramento does not currently have a central park.

Community Parks
Community parks are large parks with a typical size of 20 acres or more. They serve the needs of people from several neighborhoods or the entire city. Community parks contain a wide variety of facilities for active and passive recreation, organized sports, and night use. They also provide facilities typical of neighborhood parks for use by the surrounding residents.

Neighborhood Parks
Neighborhood parks provide for the daily recreation needs of nearby residents, with primarily passive and informal recreation facilities. The typical size is 4 to 10 acres. Active recreation use of neighborhood parks can create conflicts with local residents, and should be limited to informal practice fields and hard surface playing courts.

Mini Parks
Mini parks are small (under one acre) facilities that accommodate the daily recreation needs of nearby residents. They typically include children's play areas, sitting areas, and limited green space, but are not large enough to contain play fields. Mini parks are not large enough to provide for the recreation needs of an entire neighborhood.

Special Facilities
Special facilities serve a specific need or population group. In West Sacramento, this category includes community centers, senior centers, teen centers, community pools, and indoor gymnasi-ums.

Recreation Corridors
Recreation corridors are linear parks that include one or more types of pathways for non-motorized transportation, typically developed along a linear geographic feature such as a river, canal, railroad

corridor, or utility easement. Pathways are typically designed for multiple uses such as bicycling, walking, jogging, and rollerblading. Equestrian pathways are separated from multi-use paths. Other names commonly used for recreation corridors are greenways and bikeways.

Open Space Area
Open Space areas are lands set aside for preservation of significant natural resources, open space, and public education. West Sacramento contains wetland and riparian forest areas zoned for open space.

Other Facilities

Trails
The West Sacramento Pedestrian and Bicycle Master Plan describes a citywide system of multi-use trails and bicycle routes. Ultimately, these trails will link with other regional trails, such as the American River Greenway and the bicycle path connecting West Sacramento with Davis.

ADA Compliance

The Americans with Disabilities Act (ADA) was signed into law on July 26, 1990. On January 26, 1992, federal regulations defined in the ADA took effect. These regulations are intended to protect the civil rights of individuals with disabilities in employment, public accommodations, state and local government services, and telecommunications. Title III of the ADA (Public Accommodations) states that, "*persons with disabilities are to be provided accommodations and access equal to, or similar to, that available to the general public.*"

The ADA is civil rights legislation. There are no code requirements, only guidelines that must be interpreted and applied in a reasonable manner. However, state building codes typically require conformance with ADA in all new construction. In California, Title 24 of the state building code requires conformance for all public buildings, parks and other outdoor spaces. The ADA requires retrofitting of existing facilities to conform to the state building code. Retrofitting was required to be completed by the year 1995. However, many public agencies are still working to meet the requirements.

West Sacramento's existing park system contains play structures, picnic areas, drinking fountains, and parking areas that must be modified to comply with the ADA. The list of improvements contained in the Action Plan chapter of this Master Plan includes budget amounts to cover these expenses.

CPSC Compliance

The United States Consumer Products Safety Commission (CPSC) has established safety guidelines for playgrounds. California Senate Bill 2733 required all public playgrounds to conform to the minimum guidelines described in the CPSC Handbook for Public Playground Safety.

Many of the existing playgrounds contained within the City's park system do not meet these standards, and therefore must be upgraded. The list of improvements contained in the Action Plan chapter of this Master Plan includes budget amounts to cover these expenses.

Appendix B: Demand Analysis

Summary of Demand for Parks and Recreation Services

Cities provide public services in response to residents' perceived needs, or "demand". The following actions were taken to determine the current demand for park and recreation facilities in West Sacramento:

- Opinion survey
- Public meetings and focus groups
- Demographics analysis
- Comparison with comparable communities
- Review of standards
- Review of available trends literature
- Informal written questionnaire

The results of these initiatives are described in greater detail in this chapter. The reader is encouraged to review the opinion survey report document (available under separate cover through the Parks and Community Services Department). Based on the various components of the demand analysis, the following summary of demand is presented (not in order of importance):

- **A Central Park:** West Sacramento currently lacks a large park containing a variety of facilities that can be used as a community gathering space. Participants in the Community Workshop rated this as a high priority, and expressed a desire for a single park that would provide facilities for all age groups and interest. They also viewed such a facility as a means to improve the image of the City and provide an enhanced community identity.

- **Improved water access:** Residents value the water resources available in West Sacramento. They desire improved access to water-related recreation such as fishing, boating, swimming, and passive use.

- **Increased number and variety of facilities:** The City received low scores in the opinion survey relative to other California communities for the number and variety of facilities available.

- **Improvements to existing parks:** Participants expressed the perception that the City's parks are tired and old. Safety of park users is also of concern.

- **Recreation corridors and trails:** The corridor concept was supported in the public meetings and through the high scores received in the survey for bicycling, walking, and horseback riding.

- **Programs and activities for children and youth:** A high level of importance was expressed for providing after-school and sports programs for children and teens. Construction of a high school age teen center was also highly rated. The youth workshop participants expressed a desire for skatepark facilities.

- **Swimming:** Swimming is a very popular activity. A high level of support for a family aquatic park with swimming pools and water play was expressed.

- **Landscape entrances:** Beautification of gateways to the community with landscaping was rated highly in the survey.

- **Classes:** A high level of interest exists in organized classes for activities such as cooking, computer use, arts and crafts, and gardening.

- **Senior programs:** Senior nutrition and diet programs are considered to be very important.

- **Active recreation:** Facilities and leagues for youth sports were considered to be very important, while adult sports were not as highly rated.

Demographics

West Sacramento's population grew from 28,869 in 1990 to 31,615 in 2000, according to the U.S. Census. The City of West Sacramento Community Development Department estimates the current population to be approximately 34,000. The City's population could increase to approximately 75,000 by the year 2025, as forecast by the Sacramento Area Council of Governments (SACOG). The 2001 State of the City Report provides a summary of relevant Census data.

Public Involvement

The planning process was organized to encourage a significant level of public participation. All meetings were open to the public, and were advertised to attract attendance. To date, two community-wide public workshops, a youth focus group, a sports user's focus group, several neighborhood meetings, and the high school leadership focus group have been facilitated.

A public opinion survey was conducted to obtain a statistically valid sample of opinion regarding the need for park and recreation services in West Sacramento. The survey results are presented in a separate document available from the Department of Parks and Community Services.

In addition, a written questionnaire was distributed that has attracted 23 responses to date. The questionnaire is available through the Department of Parks and Community Services for those desiring to provide written public input. Finally, interviews were conducted with the City's professional staff, as well as representatives of the Washington Unified School District and the Port of Sacramento.

Opinion Survey

A random survey of West Sacramento residents' opinions regarding parks and community services was conducted in September and October 2001. The survey instrument included open- and closed-ended questions, with interviews averaging 12 minutes in length. 401 surveys were conducted, resulting in a margin of error between 2.91 and 4.85 percent. The survey had four main goals:

- Determine residents' overall satisfaction with the City's efforts to provide park and community services
- Ascertain both the level of importance and the degree of satisfaction residents assign to recreation programs and activities provided by the City
- Determine the specific recreational activities residents use most and are most interested in
- Profile the demographic, attitudinal, and behavioral characteristics of residents in the City of West Sacramento

The full text of the survey report is available at the Department of Parks and Community Services.

Community Workshop #1

The first citywide workshop session was held on October 9, 2001. The workshop was widely advertised and was open to all interested people. All comments were recorded and transcribed. Thirty community members participated, and several City staff members were present. All adult age groups were represented. No minors chose to attend.

The participants were divided into two groups to discuss the needs of the northern and southern halves of the City. Then the entire group reassembled to report their findings. A complete record of the public comments is included in the Appendix. The following points summarize the improvements and types of facilities desired:

- A large, Central Park in a significant, central location, with a variety of facilities and space for large gatherings
- Extension of River Walk Park
- Improved maintenance levels of existing parks
- Sports complex
- Sports fields in parks
- Teen center
- Aquatic center
- Community center
- Swimming and basketball facilities at other than school locations
- Restrooms in every park
- Bicycle Trails
- Equestrian Trails
- Fishing access to Deep Water Channel
- Public access to waterfront at the Port property
- Dog park
- Construct parks in Southport

Sports User's Focus Group

A focus group session was held on October 10, 2001 with ten participants representing youth baseball, soccer, and swimming. A complete record of the public comments is included in the Appendix. The following points summarize the improvements and types of facilities desired:

- **Swimming**: Noncompetitive and potentially dangerous conditions at the public schools were cited. A municipal aquatic complex that could serve the needs of swim leagues and the general public was desired.
- **Baseball**: A lack of full-size hardball practice and playing facilities was cited. A lighted sports complex to serve all ages was desired. Combining soccer and baseball fields at the same facility was seen as advantageous.
- **Soccer**: The soccer representatives also supported development of a lighted sports complex for soccer and baseball.
- **Other facilities** desired included improved fishing access to the City's waterways, equestrian paths, a community center, and a new golf course.

Youth Focus Group

Twenty-four students from local middle schools attended the youth session on October 10, 2001. The students all use West Sacramento's parks on a regular basis for a wide range of activities. The parks are used for organized recreation, informal recreation, and socializing. A complete record of the public comments is included in the Appendix. The following points summarize the improvements and types of facilities desired:

- Skatepark/bicycle park
- Fun challenging play structures, swings/etc.
- BMX bicycle course
- Large community park with recreation center
- Gymnasium
- Swimming pool
- Rock climbing wall
- Dance classes/socials
- Improved safety in the parks

High School Leadership Focus Group

A meeting was held with the River City High School leadership class on October 19, 2001. Thirty-five students attended. A complete record of the public comments is included in the Appendix. The following points summarize the improvements and types of facilities desired:

- Playgrounds with challenging apparatus
- Trees and shade
- Gymnasium
- Skatepark
- Soccer, baseball, basketball, and volleyball
- Dog park
- Fishing access
- Pool/waterslides
- Restrooms in the parks

Written Questionnaire

An informal questionnaire was distributed to City staff, school officials, and the general public to gather additional information. While the results are not statistically valid, a number of interesting comments and suggestions were gathered.

Desired facilities include soccer fields, a skatepark, a dog park, a gymnasium, walking trails, an aquatic park, equestrian trails, baseball fields, soccer fields, a central park, water access, tennis courts, playgrounds, bicycle paths, pools, and a sports complex.

Top issues of concern include safety, maintenance, clean restrooms, activities for youth, off-street parking, providing flexible open green space, and maintaining a balance of opportunities.

Comparable Communities Review

Table B-1 illustrates the amount of parkland provided in West Sacramento as compared with several other California cities. The table also indicates the "standard", or desired goal adopted in each community. For comparison reasons, population levels are as reported by the 2000 census.

Table B-1: Comparable Communities

City	Year 2000 Population 1	Acres 2	Acres/1,000 3	Standard 4
West Sacramento	31, 615	101	3.2	5
Roseville	79,929	842	10.5	9
Davis	60,308	450	7.5	5
Rocklin	36,330	100	2.8	5
Pleasanton	63,654	330	5.2	(no standard)
Redding	80,865	252	3.1	10 5

Footnotes:
1. Population as reported in 2000 U.S. census
2. Existing developed park acres in community, neighborhood, and mini parks (school ground acreage excluded)
3. Existing developed park acres per each 1,000 residents
4. Community goal for acres/1,000 residents
5. Redding standard includes developed open space areas. Redding has 614 acres total including open space (7.6 acres/1000)

Non-Resident Demand

Just as residents of West Sacramento take advantage of other greater Sacramento Area parks, residents of other nearby communities use West Sacramento's park system. The Broderick Boat Ramp and the softball and soccer fields at Bryte Park receive a significant amount of non-resident use.

The City contains a significant employment base within its borders, with approximately one job per resident. Non-resident workers utilize the City's park and recreation system, creating additional demand. The City's General Plan recognizes this demand and requires new commercial, industrial, and office development to pay park impact fees to help offset the demand.

General Plan Standard

The 2000 General Plan has been updated to reflect the 5 acre/1000 resident standard.

Statewide Recreation Trends

The most recent statistically reliable statewide data concerning recreation desires and attitudes are presented in *Public Opinions and Attitudes on Outdoor Recreation in California 1992*, by the State Department of Parks and Recreation. This publication details the results of a public opinion survey conducted in 1992. The ten activities with the highest adult participation rates (defined as one or more days per year participation in each of 42 listed activities) were:

1. Walking (88.0%)
2. Visiting museums or historic sites (75.7%)
3. Beach activities (69.4%)
4. Driving for pleasure (68.7%)
5. Use of open turf areas for casual and unstructured activities (66.9%)
6. Visiting zoos and arboretums (65.6%)
7. Picnicking in developed sites (63.9%)
8. General nature study & wildlife viewing (56.0%)
9. Trail hiking (54.8%)
10. Camping in developed sites with tent or vehicle (53.9%)

By contrast, participation rates for organized, active sports were much lower:

1. Softball and baseball (34.0%)
2. Basketball (21.0%)
3. Golf (19.4%)
4. Tennis (15.2%)
5. Soccer (10.2%)

Another question asked adult respondents for the number of days per year each activity was engaged in. The ten activities with the greatest activity days were:

1. Walking (103.8 days per year)
2. Driving for pleasure (30.5)
3. Bicycling on paved surfaces (23.1)
4. Use of open turf areas for casual and unstructured activities (19.8)
5. Jogging and running (17.6)
6. Beach activities (14.6)
7. General nature study and wildlife viewing (14.5)
8. Swimming in outdoor pools (12.6)
9. Picnicking in developed sites (10.4)
10. Swimming in lakes, rivers, and the ocean - not in pools (10.2)

The ten activities with the highest youth activity days per year were:

1. Walking (94.7 days per year)
2. Bicycling on paved surfaces (61.0)
3. Use of open turf areas for casual and unstructured activities (57.5)
4. Jogging and running (51.8)
5. Basketball (37.4)
6. Use of play equipment, tot lots (34.9)
7. Swimming in outdoor pools (27.7)
8. Soccer (17.0)
9. Football (15.9)
10. Beach activities (11.0)

A separate (written) survey of youth aged 8 to 17 was conducted by the State concurrently with the adult survey. The ten activities with the highest participation rates were:

1. Use of open turf areas for casual and unstructured activities (93.2%)
2. (tie) Walking (89.5%)
2. (tie) Bicycling on paved surfaces (89.5%)
3. Picnicking in developed sites (83.4%)
4. Beach activities (81.8%)
5. Jogging and running (81.1%)
6. Visiting museums, historic sites (80.9%)
7. Basketball (80.1%)
8. Softball and baseball (79.0%)
9. Use of play equipment, tot lots (73.6%)

It can be seen that active sports such as basketball, softball, baseball, soccer, and football have a greater participation rate among youth than among adults. However, general outdoor activities such as walking, bicycling, and open turf use, are important to both youth and adults.

National Sporting Goods Association Survey

The National Sporting Goods Association (NSGA) conducts an annual survey of recreation activity participation. In 1993, the top ten (of 49) activities, as measured by percentage of respondents participating at least one day per year, were:

1. Exercise waking (64.4%)
2. Swimming (61.4%)
3. Fishing (51.2%)
4. Bicycle riding (47.9%)
5. Camping (42.7%)
6. Bowling (41.3%)
7. Exercising with equipment (34.9%)
8. Basketball (29.6%)
9. Billiards/pool (29.4%)
10. Aerobic exercising (24.9%)

Appendix C - Summary of Public Comments

COMMUNITY WORKSHOP #1
October 9, 2001

GROUP NORTH

- West Sacramento has no significant parks
- No place for large gatherings
- Want riverpark to continue to Todhunter
- **Need a large sports complex**
- Sports complex should be lighted
- Keep sports complex away from residential
- Interest in a marina in north part
- Have not done enough with riverfront
- Need teen/youth center
- Need transportation for kids
- We are too reliant on schools for:
  -swimming pools
  -pool tables
  -basketball courts
  facilities not always available

Aquatic center needed

- Swimming pools
- Therapy pools
- Swim lessons
- First Aid
- Water/boating safety
- Special facilities should have surveillance cameras
- Theater
- Dance hall

General Comments

- Improve parks – make beautiful to encourage people to come to West Sacramento
- Theme park – to attract people
- -Mark Twain theme/paddle wheels/history pony express
- Central park needed
- Include library in a park
- McKinley Park in Sacramento – good example
- Each park should be designated for certain types of use.
- Parking needed at Bryte
- Keep all mature trees!
- Replace trees as they die
- ***Need parking at River Walk**
- All parks need permanent restrooms (HC Accessible)
- Keep them open
- Enforce curfews
- Enforce park rules (ordinanc

COMMUNITY WORKSHOP #1 (continued)

- New development should pay for maintenance
- Incorporate a water fountain – feature of beauty and significance
- Triangle near library would be a good park (nears Carol's)
- Would work well with new city hall
- Incorporate drought – resistant trees and shrubs
- Parks should have better signage
- Vandalism, drub, gang issues
- Bike trails, buses can help with parking
- Fishing pier, possibly with a restaurant like in L.A.
- Need better communication – Re: meeting notification
- More adult evening classes
- Big central park - #1 need
- Big shopping area!
- Pony rides
- Eating places!
- Use community volunteers to help maintain parks

GROUP SOUTH

General Comments

- Look at big picture
- Not just parks at schools
  - -need diversity
- Need community gathering place
  - -events
  - -farmers market
  - -youth programs
- Funding is often short
- Want places for group functions with appropriate facilities
  - -toilets
  - -meeting rooms
  - -etc.
- Condition of parks reflective of city efforts for public
  - -West Sacramento parks lacks quality amenities/conditions
  - -need beauty
  - -"an old town" – tired looking
- Currently no bike trails
- Funding – it's there in south – why aren't parks being built?
- Bait 'n' switch in south
  - -no parks as promised by city
  - -same with schools
- Who is responsible to get parks built as promised?
- Need to hold developments to promises (promise to build parks and schools)

COMMUNITY WORKSHOP #1 (continued)

Recreation

Fishing

- Can't get to it at Deep Water Channel
- Need public access to Deep Water Channel
  - -need park adjacent to it on south

Horses

- Need plan for equestrian uses in rural residential zoned areas

Themes

- -waterfronts
- -paths as connection
- -watching boats

Central Park

- -Need to develop one but West Sacramento is not ready
- -River Walk is a possibility, more targeted to business however
- -Needs to link north and south
  - -symbolic

Neighborhood Parks

- Priority should be neighborhood park
  - -kids play everyday
  - -safe
  - -would indicate investment in community

Community Center Criterial/Needs

- -conference/banquet rooms
- -gym
- -theater
- -pool
- -in a park
- -skating
- -indoor soccer
- -rock climbing
- -jogging
- -tennis: indoor and outdoor

Other Considerations

- Need dog park – as new park
  - -Sacramento had them
- Look at scale
  - -need range of scales
    - -big/community/regional
    - -neighborhood
  - -open space
    - -small parks with multiple uses/attractions
  - -"people scale"

COMMUNITY WORKSHOP #1 (continued)

- Serving kids is key
  -bikes
  -safety
  -skaters
- New bike/pedestrian crossing over canal
- Look at Southport plan
- Start with just getting parks built before attempting major actions (Central Park/Community Center)
- No reason to go to parks

Good Models to Study

- Davis is good example
  - Davis spends money on maintenance and has greenbelt system
    -want same for West Sacramento
- City of Roseville
  -proactive park development prior to homes – forced upon developers
    -good model for West Sacramento
- Portland is a good model

High Priority South Needs/Opportunities

- Activities close to downtown
  -provide bike access from Southport to downtown to attract those residents
- Need soccer/hardball/softball in new parks
- Extend light rail and put parks ner stations (park and rides)
- Concerned reservation areas with toilets in every park, also walking trail
- Exercise training trail
- Improve and maintain parks that have already been built

Port Area Needs/Opportunities

- Public access
- Trail – all users
- Boat ramp
- Open grass areas/picnic areas
- Toilets
- Aquatic centers
- 4th of July happens there (on bridge)
  -expand to have more events
  -get off the bridge, put on land
- Boat viewing

COMMUNITY WORKSHOP #1 (continued)

South Group Summary

Good Examples
- Davis
- Roseville
- Portland

Problems
- Bait-n-switch
- Maintenance of existing parks

Opportunities/Needs
- Trails
- Canal
- Riverfront
- Port (possible temporary use)
- New blood will force political change
- Regional Park/Recreation Center/Complex

SPORTS USERS FOCUS GROUP
October 10, 2001

Swimming

Competition: 174 kids – up to 200 on swim team
- -Had to close registration – lack of facilities
  - -use River City School
  - -outdated
- -Racing styles have changed but pool won't accommodate "deep" diving at start
- -One conference school refusing to use starting blocks at River City pool

Recreation: Very short summer season program
- -Poor choice of times/lack of available pool time
- -Aquatic center would benefit all
- -Need to accommodate all ages (families) and serve competition needs
- -Swim team draws from across county
- -Currently need to rent competitor's pools now.

Community aquatic center planning criteria:
- school use
- public/recreation
- flexible
- rental opportunities
- revenue generating
- serve seniors/fitness needs
- multi-use
- lots of parking
- indoor/outdoor
- accommodate swim lessons for very young
- do it right for future

Baseball

There are no hardball parks in West Sacramento and none planned
- We need a baseball facility
- Now need to pay to play in Davis
- Need lighted fields
- Need senior kids fields
- Add lights to memorial park – neighbors would allow it
- Parents maintain facilities with fundraisers, work parties. City does not maintain
- 2 little leagues – Wash L.L./W.S.L.L. (400 kids)
- Need practice fields – currently use elementary schools
- River City High School field not available until June when school is out
- One complex to serve all ages – to keep kids interested
- Shared parking baseball/swimming
- OK to share fields between soccer and small kids fields (no fences needed).

SPORTS USERS FOCUS GROUP (continued)

Soccer

- 550 kids in league
- 100 added each year
- West Sacramento Soccer Club

Bryte Park – Needs:

- Bathrooms
- Snack bar
- Parking
- Equipment storage
- Fields are in good condition
- Not enough fields
- Need lighted fields – can't practice in fall

Basketball

- Very popular
- City league – uses Golden State Middle School and River City High School
- Can't practice during week
- No league for older kids
- Portable classrooms have taken up basketball courts
- Don't forget basketball-no gym/facilities

Fishing

- Need access to water, HC dock, elderly
- Should have fishing docks at port or river for the disabled

Bowling

- Serve existing leagues

Equestrians

- There are lots of users in Southport need riding areas

Community Center

- Need meeting rooms

Golf

- Need golf per existing plan

General Comments

- Need bathrooms in each park
- Central large sports complex is desired (Bring community together – don't split people up)
- Need all the other services as well
- Community doesn't feel support from city/parks
- Is there a focus on creating/focusing on a Central Park?

YOUTH FOCUS GROUP
October 10, 2001

Wants

Water park
Skate park -street course
Bike – Motocross
    -street/vertical
Community park
    -recreation center but outdoor
    -arts and craft
    -sports
    -big park
Velcro Wall
Gymnasium/wrestling room
Walkway for elderly
Small tree groves
    -shade areas but not the whole park
New pool
Snack bars
    -soda, ice cream, candy, hot food
Music
Tagging/Art wall
    -cleaned monthly
Clean bathrooms
More electrical outlets
Video arcades in buildings
    -secure
    -TV
    -couches
    -"like this place"
Dance floor/club
    -by am/pm by McDonalds
    -by money store
    -in stadium
    -by golf
    -in Southport
    -in neighborhood, not too far
    -Elkhorn Park
Go carts
Play structures like McKinley Park
Pond -kind of like a pool "swimming pond" with fountain in middle
Race Track - with no cars – for bikes and boards.
Go to Yolo High School now for this
    -bike jumps, etc.

YOUTH FOCUS GROUP (continued)

Parks You Like

100' Slide
Curly-Q slides -like at McDonalds
Teeter-Totters-big ones
Lots of benches in shade
Handrails in skate park
Fishing education
    -stocked regularly
    -loaner poles
Centrally located with other things to do (shopping, etc.)
Board wild – skate park in Woodland

Things You Don't Like

Scooters
Gang writing (graffiti)
Boring parks – nothing to do
    -targeted to young kids only, not middle school
Not enough basketball courts, don't like waiting

Top Priority

Big skate park/bikes
Dance floor
Fishing pond
Dog park
Swirly slides
Jungle gym
Velcro wall
Rock climbing wall
Play structure like McKinley Park
Something for all ages

HIGH SCHOOL LEADERSHIP FOCUS GROUP
October 19, 2001

When asked what do you like or want in parks, they said:

- Sand, not bark, in playgrounds
- Swings
- Slides, spiral slides
- Older kid playground, like at McKinley Park in Sacramento
- Rainbow park
- Large trees
- More trees
- More shade
- Tree swings
- Zipline
- See-saw
- Spring animals
- Merry-go-round playground
- Skate park
- Soccer field
- Baseball field
- Clean restrooms, no portables
- Water fountains
- Basketball courts
- Tennis courts
- Dog park
- Pond for boats, fishing
- Bridge playgrounds together
- Ropes course
- Swimming pool with slide
- 2 sections in playgrounds, one for kids, one for older kids. Age appropriate
- Nothing in parks is too inviting. Existing parks old, tired, dirty
- Monkey bars
- Have community unity day to clean parks up
- Better picnic areas
- Volleyball
- Safety lighting
- Jungle gyms
- Handball
- Tetherball
- Flowers and landscaping
- Recycle parts of park
- Gymnastics
- A gym
- Indoor pool
- Water park
- Better pest control
- Rose garden
- Tic tac toe blocks
- Space ship playground
- Crack ban

WASHINGTON NEIGHBORHOOD GROUP
November 13, 2001

When asked what do you like about your neighborhood or want in your parks, they said:

- Feeling of a small town
- Close to the river
- A "Mayberry" feeling
- River Walk Park is beautiful
- I like the people
- It is close to Sacramento
- Freeway access
- Close to the airport
- Feels safe
- A mellow feeling
- Harmony on the River is an excellent program
- Good summer programs
- Jazz and Pancakes is fun
- Put more trees in the parks
- Need a City Activities Center
- Need soccer fields
- Need paddleball courts
- I go to Raley Field
- Jogging
- Cycling
- Have better bike path
- Need park polices
- Need heavier trash cans in parks
- West Sacramento is multi-cultural. We need a multi-cultural fair and market pavilion. Give multi-cultures a chance to share with all.
- Skateboard park
- Roller blades
- BBQ areas
- Tennis courts

COMMUNITY PARKS

Alyce Norman/Bryte Playfields

Type: Community Park
Location: Todhunter @ Carrie Street
Neighborhood Planning Area: Bryte-A2
Size: 17 acres

Inventory
Baseball fields (3 - youth)
Softball fields (4 – youth)
Soccer fields (1)
Scoreboards (2)
Bleachers (6)
Restrooms/concession building
Trash receptacles and recycling bins
Off-street parking (unpaved)

Programmed Activities
West Sacramento Girls Softball
Washington Little League
NFL Flag Football
Junior San Francisco Giants Baseball

Bryte Park/Golden State Middle School

Type: Community Park
Location: Todhunter @ Carrie Street
Neighborhood Planning Area: Bryte-A2
Size: 21 acres (11.4 Bryte Park, 9.6, Golden State turf fields)

Inventory
Baseball fields (2 – youth)
Softball fields (2 – lighted, adult)
Soccer fields (7)
Basketball court (1- full court)
Bicycle rack (1)
Drinking fountains (3)
Group picnic area with shade structure
Lawn area
Picnic tables (5)
BBQ's (3)
Play area
Restrooms
Trash receptacles and recycling bins

Programmed Activities
Adult softball
Youth soccer
Youth baseball

River City High School

Type: Community Park
Location: Clarendon Street
Neighborhood Planning Area: West Sacramento C9
Size: 22 acres

Inventory
Football field
Track
Baseball fields (4)
Tennis courts (6)
Basketball courts (6 hoops)
Volleyball courts, asphalt (3)
Swimming pool, diving pool, wading pool, changing house

Programmed Activities
Senior Little League baseball

River Walk Park

Type: Community Park
Location: Riverfront between Tower and I Street bridges
Neighborhood Planning Area: Broderick B3
Size: 4 acres

Inventory
Riverfront promenade/pathway
Union Square
Veteran's Memorial Plaza
Grand Staircase amphitheater
Picnic tables (8)
BBQ's (3)
Lawn area

NEIGHBORHOOD PARKS

Elkhorn Park

Type: Neighborhood Park
Location: Cummins Way @ Greenwood Avenue
Neighborhood Planning Area: Broderick B1
Size: 5.2 acres

Inventory
Barbecues (6)
Drinking fountain (1)
Horseshoe pits (1)
Lawn area
Pathway lighting
Picnic tables (6)
BBQ's (6)
Play area - tot lot (1)
Restrooms (portables)
Trash receptacles and recycling bins

Programmed Activities
Little League (at adjacent Elkhorn School fields)

Linden Park

Type: Neighborhood Park
Location: Linden Avenue @ Summerfield Drive
Neighborhood Planning Area: Southport D1
Size: 4.0 acres

Inventory
Barbecues (2)
Drinking fountain (1)
Horseshoe pits (1)
Lawn area
Pathway lighting
Picnic tables (4)
BBQ's (2)
Play area - tot lot (2 structures)
Trash receptacles and recycling bins
Bike rack

Programmed Activities
Youth soccer

Meadowdale Park

Type: Neighborhood Park
Location: West Capitol at Interstate 80
Neighborhood Planning Area: West Sacramento C2
Size: 4.0 acres

Inventory
Drinking fountain (1)
Lawn area
Pathway lighting
Off-street parking lot (20 spaces)
Picnic tables (5)
Benches (2)
Shade structure
Play area - tot lot (1 structure)
Trash receptacles and recycling bins
Bike rack

Programmed Activities
None

Memorial Park

Type: Neighborhood Park
Location: Bounded by Regent, Alabama, Euclid, and Delaware
Neighborhood Planning Area: West Sacramento C9
Size: 4 acres

Inventory
Basketball (half-court)
Baseball fields (4 – youth)
Drinking fountain (1)
Horseshoe pits (2)
Picnic tables (2)
Play area - tot lot (2 structures)
Trash receptacles and recycling bins
Restrooms

Programmed Activities
West Sacramento Little League

Sam Combs Park

Type: Neighborhood Park
Location: Stone Boulevard @ Jefferson Boulevard
Neighborhood Planning Area: West Sacramento C9
Size: 4.5 acres

Inventory
Barbecues (2)
Drinking fountain (1)
Horseshoe pits (1)
Lawn area
Shade trees
Picnic tables (6)
BBQ's (2)
Play area - tot lot (2 structures)
Trash receptacles and recycling bins
Off street parking lot (12 cars)
Restrooms (portables)
Clubhouse building

Programmed Activities
None

Summerfield Park

Type: Neighborhood Park
Location: Linden Avenue near Diane Drive
Neighborhood Planning Area: Southport D1
Size: 8.9 acres

Inventory
Soccer field (2)
Basketball (1 full court)
Restrooms (portables)
Baseball backstops on turf area (3)
Dog run (fenced)
Trash receptacles and recycling bins
Play area – tot lot (1 structure, 1 swing)

Programmed Activities
Youth soccer
Little league practice

Touchstone Lake Park

Type: Neighborhood Park
Location: Linden Avenue near Independence Avenue
Neighborhood Planning Area: Southport D1
Size: 4.0 acres

Inventory
Picnic tables (2)
BBQ's (2)
Drinking fountain
Lawn area
Shade trees
Pathway lighting
Bench (1)
Trash receptacles and recycling bins
Play area – tot lot (1 structure, 1 swing)
Lake

Programmed Activities
None

Westacre Playfield

Type: Neighborhood Park
Location: Evergreen Avenue @ Westacre Road
Neighborhood Planning Area: West Sacramento C4
Size: 5.0 acres

Inventory
Picnic tables (2)
Drinking fountain
Lawn area
Shade trees
Bench (1)
Trash receptacles and recycling bins
Play area – tot lot (1)

Programmed Activities
None

Westfield School Playfields

Type: Neighborhood Park
Location: Poplar Avenue @ Oxford Street
Neighborhood Planning Area: West Sacramento C4
Size: 7acres

Inventory
Soccer fields (3 – youth)
Baseball field (2 – youth)
Lawn area
Play area – tot lot (1)

Programmed Activities
Youth soccer

MINI PARKS

Circle Park

Type: Mini Park
Location: Alabama Avenue @ Circle Street
Neighborhood Planning Area: West Sacramento C9
Size: 0.3 acre

Inventory
Picnic tables (4)
Heritage oak grove
Trash receptacles
Lawn area

Patwin Park

Type: Mini Park
Location: Summerfield Drive at Betty Way
Neighborhood Planning Area: Southport D1
Size: 0.2 acre

Inventory
Undeveloped residential lot, potential link to recreation corridor

Pennsylvania Park

Type: Mini Park
Location: Pennsylvania @ 17th Street
Neighborhood Planning Area: West Sacramento C9
Size: 0.5 acre

Inventory
Picnic tables (3)
Trash receptacles and recycling bins
Lawn area

Redwood Park

Type: Mini Park
Location: Redwood Avenue
Neighborhood Planning Area: Southport D2
Size: 0.5 acre

Inventory
Picnic tables (2)
Horseshoes (1)
Drinking fountain
Bench (1)
Trash receptacles

SPECIAL FACILITIES

Broderick Boat Ramp

Type: Special Facility
Location: A Street @ the Sacramento River
Neighborhood Planning Area: Broderick B1
Size: 4 acres

Inventory
Boat launching ramp (1 lane)
Off-street parking (24 cars and 60 cars with trailers)
Restroom/concession building
Parking lot lighting
Drinking fountain
Picnic tables (2)
Interpretive signage
Benches (2)
Trash receptacles and recycling bins

West Sacramento Senior Center

Type: Special Facility
Location: 644 Cummins Way
Neighborhood Planning Area: Broderick B1

Inventory
Senior center building and office
Library
Multi-purpose room
Kitchen
Art room

Programmed Activities
Classes and other programs
Nutrition meals
Social events

Appendix E - Suggested Park Standards

Central Park Standards

A central park is a unique facility and as such has no standards. As envisioned for West Sacramento, the Central Park should contain unique recreational opportunities, should be oriented to the water, should be centrally located, and should generally otherwise conform to the standards given below for community parks.

Community Park Standards

Definition	• Large park that includes passive and active recreation facilities that serve the entire City or a substantial portion of the City. • A community park should include the facilities that are also typically found at neighborhood and mini parks.
Service Area	• Up to four-mile radius.
Size	• 20 acres or larger.
Site Characteristics	
Configuration	• Contiguous usable (non-linear) shape, with level terrain to accommodate active recreation.
Access/Location	• Locate on an arterial or collector street. • Provide at least two major street frontages. • Provide connection to pedestrian and bicycle routes. • Locate to minimize conflicts with residential areas.
Character	• Has desirable visual and natural attributes for passive recreation, such as waterway frontage or significant vegetation.
Basic Requirements	
Outdoor Sports	• Regulation facilities for organized league practice and play for softball, baseball, and/or soccer. • Bleachers, restrooms, and concession stands at league sports facilities. • Tennis courts, basketball courts, volleyball courts, handball courts, and practice wall. • Lighting for outdoor sports facilities.
Passive Recreation	• Jogging path, minimum two miles long. • Open turf area for casual games, minimum two acres.
Special Facility	• Community parks should include at least one special facility such as a pool, community center, gymnasium, or amphitheater.

Community Park Standards (continued)

Play Areas	• Tot lot for ages 2-5, minimum one. • Play lot for ages 6-12, minimum one. • Should include climbing structures, other apparatus, and sand play • All play experiences must be accessible to the disabled (ADA) and meet CPSC guidelines.
Family Picnic Areas	• Shaded and wind-protected area. • Tables for 6-8 people each. • Barbeque facilities. • Locate adjacent to open turf or play areas.
Group Picnic Areas	• Shaded and wind-protected area. • Picnic tables, serving tables, and barbecue facilities for 200 persons minimum. • Restroom facilities nearby. • Play area nearby. • Locate adjacent to open turf area and away from nearby residential areas.
Parking	• Off-street, minimum 100 spaces.
Restrooms	• Permanent restroom buildings, minimum one per each 10 acres.
Lighting	• Provide lighting at athletic fields and courts, parking lots, and pathways. • Design to prevent glare and spillover into adjacent residential areas.
Telephone	• Provide public phones accessible at all times. • Locate throughout park at reasonable intervals for safety.
Bicycle Parking	• Lockable parking at suitable locations throughout park.
Pathway System	• Provide multi-use paved paths, minimum ten-foot wide, for service and emergency access and police surveillance.
Optional Elements	• Exercise course, 12 or 24 stations. • Specialized sports facilities such as bocce ball courts or putting green. • Food concessions building. • Community garden area.

Neighborhood Park Standards

Definition	• Medium sized park that provides basic recreational activities for a specific neighborhood. • Typical neighborhood park facilities may be included as a portion of a larger community park.
Service Area	• 1/2-mile radius to serve a single neighborhood, or populations up to 5000.
Size	• Two to ten acres.

Site Characteristics

Configuration	• Contiguous, usable (non-linear) shape, with level terrain to accommodate casual (non-organized) sports activities.
Access/Location	• Locate on a collector or arterial street. • Provide two major street frontages if possible. • Provide connection to pedestrian and bicycle routes. • Locate centrally within neighborhood. • Locate adjacent to schools where possible.
Character	• May contain natural features for passive recreation, such as water body or significant vegetation. • Should contain large trees for shade and windbreak.

Basic Requirements

Restrooms	• Minimum 3 stalls each side. • Separate mens and womens restrooms
Passive Recreation	• Open turf area for non-organized sports, minimum one acre, two acres or more desirable. • Pathway system for walking/jogging.
Play Areas	• Tot lot for ages 2-5. • Play lot for ages 6-12. • Should include climbing structures, other apparatus and sand play. • All play areas must be accessible to the disabled (ADA) and conform to CPSC guidelines.
Family Picnic Areas	• Shaded and wind-protected area. • Minimum three tables for 6-8 people each.
Drinking Fountain	• Minimum one, accessible to the disabled.
Bicycle Parking	• Lockable parking, minimum one location.

Neighborhood Park Standards (continued)

Lighting	• Pathway lighting only.
Telephone	• Provide public phone.
Optional Elements	• Tennis courts, basketball courts, volleyball courts, handball courts, or practice wall. • Barbeque facilities at family picnic tables. • Off-street parking for 10 to 30 cars. • Exercise course or cluster. • Practice baseball diamond not lighted.

Mini Park Standards

Definition	• Small parks located within residential areas that provide play areas for small children or passive sitting areas. • Mini park facilities may be provided within a neighborhood or community park.
Service Area	• 1/4-mile radius.
Size	• 1/4 to 2 acres.
Site Characteristics	• Level areas accessible to the disabled. • Located within neighborhoods and in close proximity to high density residential or housing for the elderly.
Basic Requirements	• Benches in shaded area. • Tot lot for children under age 2-5. • Trash receptacle, minimum one.
Optional Elements	• Drinking fountain. • Small turf area. • Picnic table(s) to accommodate 6-8 people. • Play area for children age 6-12.

Special Facility Standards

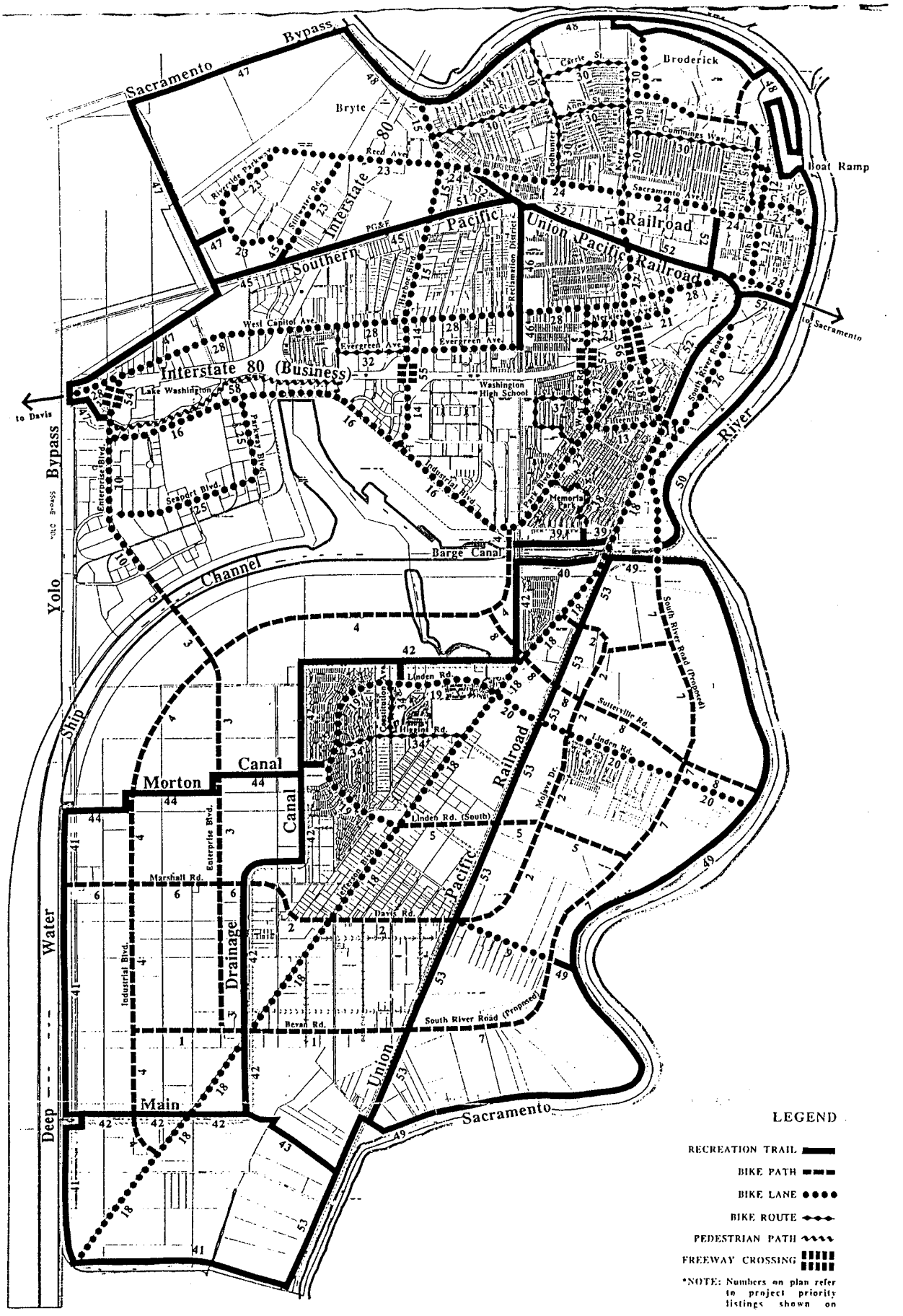
Definition	• A facility such as a community center, athletic complex, aquatic center, or other cultural or athletic facility that services a specific need for a portion of the City's population.
Service Area	• The entire City.
Size	• Varies.

Special Facility Standards (continued)

Location	• May be included within a community park or may be at a separate location.
Facility Types (may be combined)	• Community center, with auditorium, meeting rooms, classroom space, offices, indoor recreation space, crafts room, exercise space, etc. • Indoor gymnasium. • Aquatics complex. • Combined "swim/gym". • Childcare facility. • Community theater, indoor. • Outdoor theater. • Sports complex for adults, youth, or both. • Senior center. • Teen center. • Community art center

Recreation Corridor Standards

Definition	• Linear Corridors designed for recreational travel, non-motorized transportation, and passive use. • also called Greenways and Bikeways
Service Area	• Located to serve the entire City and link residential areas with parks, schools, places of worship, places of employment, and commercial destinations.
Size	• Sufficient width to accommodate the use and protect the adjacent natural resource, if present
Site Characteristics	• Open space corridors adjacent to rivers, canals, utility easements, and railroad corridors. • Minimum of 30 feet wide
Basic Requirements	• Multi-use paved pathway for bicycling, walking, running, roller-skating. • Trailhead areas with benches, picnic tables informational and regulatory signage, trash and recycling receptacles.
Optional Elements	• Equestrian path, soft surface, separated from multi-use path. • Pathway lighting • Interpretive signage • Passive use park elements such as small play areas, seating and picnic areas



MASTER PLAN DIAGRAM

Bicycle and Pedestrian Path Master Plan

City of West Sacramento, California

Callander Associates
Landscape Architecture

Current Bike Path

WEST SACRAMENTO

BICYCLE & PEDESTRIAN PATH MASTER PLAN

OCTOBER 9, 1991

Prepared for The City of West Sacramento

CALLANDER ASSOCIATES

landscape architecture
park & recreation design

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I. INTRODUCTION

Alternative modes of transportation are becoming increasingly valuable as air pollution, fuel shortages, transportation costs, and parking and traffic congestion escalate. Bicycle and pedestrian paths encourage bicycling and walking as alternatives to automobile transportation, thereby diminishing the impact of transportation on a quality, fuel reserves, and open space, currently experienced as a result of increasing numbers of automobiles. A path system can also serve as an alternative to mass transit systems, especially for residents with lower incomes who may currently have no other choice for transportation than mass transit.

Bicycle and pedestrian paths also make a contribution toward the recreational opportunities of a community. The past decade has seen an increasing interest in bicycling, as evidenced by large volumes of bicycle sales and increasing numbers of bicycles on roadways. Hiking, as well as bicycling, has been popularized by health professionals who have advocated benefits associated with these recreational activities. A well developed system of paths for bicycling and hiking that create loops of varying distances will surely expand the recreational opportunities of a community beyond traditional park boundaries.

SCOPE OF THE MASTER PLAN

The Bicycle and Pedestrian Path Master Plan identifies existing path facilities, opportunities, constraints, destination points, and design standards. This information serves as the basis for a concise outline of goals with supporting I policies; a plan showing recommended locations of bicycle and pedestrian paths, and design guidelines; an implementation program; and phasing priorities.

The Master Plan is conceptual; precise alignments and actual locations of improvements are not indicated. Detailed design development of the Master Plan will occur step by step, with direction given by appropriate city procedures, and will incorporate public participation in the process. City procedures include: Department of Parks & Community Services staff review, Community Development Department staff review; Department of Public Works staff review; Parks and Recreation Commission hearings, Planning Commission hearings, and City Council action.

II. EXISTING FACILITIES & OPPORTUNITIES

There are numerous opportunities in West Sacramento for bicycle and pedestrian paths; however, existing facilities are few and most opportunities in the City are utilized by residents on an informal basis. Most formal opportunities occur at the adjoining City of Sacramento and Yolo County bikeways. The Sacramento bikeway connects to the City of West Sacramento at the east end of West Capitol Avenue via Tower Bridge. The Yolo County bikeway provides

access across the Yolo Causeway from the west end of West Sacramento Avenue and connects to City of Davis bikeways at the western end of the causeway.

EXISTING FACILITIES

Existing facilities in West Sacramento are shown in Figure 1, and destination points are shown in Figure 4. The existing bikeway on West Capitol Avenue connects the Sacramento bikeway to the Yolo County bikeway, and consequently Davis bikeways, by providing a connection between Tower Bridge and the Yolo Bypass causeway.

The facility on West Capitol Avenue is a Caltrans Class III Bikeway, or designated bike route. Another bike route exists on Sacramento Avenue where striping at the roadway edge is of sufficient width to qualify as a Class II Bikeway, or bike lanes, but is signed a bike route. A Caltrans Class II Bikeway, or bike lane, is striped and signed on Jefferson Boulevard between Sacramento Avenue and West Capitol Avenue.
1:3 Bikeway standards are defined in Chapter IV.

The Yolo County bikeway is a Caltrans Class I Bikeway, or bike path, and, provides a link to bikeway facilities in the City of Davis by way of the Yolo Bypass causeway. Bikeway connections between Sacramento and West Sacramento, other than Tower Bridge, will depend on new bridge construction, since the cities are separated by the Sacramento River. Informal usage of the Southern-Pacific railroad bridge should be discouraged because lack of separation from the tracks is unsafe and steps leading up to the bridge are inconvenient for bicyclists.

Additional pedestrian and bicycle facilities are currently being planned as shown in Figure I. Yolo County is planning a bicycle and pedestrian path at levees long the west sides of the Sacramento Bypass and Yolo Bypass which will link the northwest and west portions of the City. The Lighthouse Marina development project, located on the Sacramento River in the northeast corner of the City, includes bike paths, bike lanes, and a recreation trail along the River. Construction of these facilities will be included in the development of Lighthouse Marina.

Off-street bike paths exist on both sides of a portion of the Linden Road right-of-way, east of Jefferson Boulevard, and do not meet Caltrans standards for Class I Bikeways as defined in Chapter IV. The remainder of this segment of Linden Road is planned for a Caltrans Class II Bikeway, or bike lanes, which will occur in the street. The existing bike paths are approximately four feet in width, which is insufficient for two-way bicycle traffic. One-way traffic on a bike path poses a safety hazard because it is unenforceable, and the street right-of-way is of insufficient width for widening the existing bike paths for two-way traffic.

Transitions from two-way traffic on the bike paths to bike lanes, which are one-way, requires bicyclists to cross street traffic and thereby poses another safety hazard.

OPPORTUNITIES AND CONSTRAINTS

In West Sacramento, opportunities for bicycle and pedestrian paths occur at street and railroad rights-of-ways, waterways, and utility easements. Major constraints are
formed by the railroads, the freeways and the Deep Water Ship Channel. Opportunities are shown in Figure 2 and constraints are shown in Figure 3.

Streets

Sidewalks exist on both sides of most residential streets in West Sacramento, and most of these streets have sufficient width, low traffic volume, and low traffic speed to adequately accomodate bicycles and pedestrians without additional facilities. Most existing collector and arterial streets can provide a minimum of a designated bike route, and those that are scheduled for traffic improvements can be planned to include bike lanes and sidewalk improvements. Streets in areas of future development, where expanded street rights-of-way can be established, can be planned for bicycle and pedestrian paths that are adjacent to the street and separated from it. Measures can also be taken to provide pedestrian paths adjacent to the
streets with a width greater than the existing city sidewalk standard, if desired.'

Railroads

The Southern Pacific Railroad and Union-Pacific Railroad rights-of-way are also used by bicyclists and pedestrians on an informal basis. A portion of Union-Pacific Railroad tracks from Sacramento Avenue to Fifteenth Street, as well as a spur along the north bank of the Barge Canal, may be relocated which would open these areas to development of a path system on top of the railroad grade. A path system can also be developed along the edge of rights-of-way of railroad lines that will remain in service.
The railroads present a constraint, as well as an opportunity, to the development of a path system since the railroad lines divide the city into four areas in the northern portion and two areas in the southern portion. Crossings occur at street locations; in the north portion of the City at Harbor Boulevard, Jefferson Boulevard, Sacramento Avenue and West Capitol Avenue, and in the south at Linden Road, Davis Road,
and South River Road at Gregory Avenue.'

Waterways

Other opportunities for bicycle and pedestrian paths, as evidenced by informal useage, occur in West Sacramento along the Sacramento River, the Deep Water

Ship Channel, Lake Washington, and the Main Drainage Canal. The Deep Water Ship Channel is a constraint as well as an opportunity to the development of a path
system because it separates the northern half of West Sacramento from the southern'
half and divides the Sacramento riverfront as well. The only existing connection between the two portions of the City occurs at the Jefferson Boulevard bridge, which is narrow but is proposed for widening to four lanes. Future bridges are planned at
Enterprise Boulevard, Harbor Boulevard, and South River Road. The surface _ quality of the existing bridge at Jefferson Boulevard, which is constructed of metal grating, should meet Caltrans standards defined in Chapter IV.

Easements

Pedestrian and bicycle usage also occurs along easements belonging to Pacific Gas and Electric (PG&E) and Reclamation District No. 900. PG&E easements occur at overhead electrical transmission towers and a gas line in the northwestern portion of the city, and overhead electrical lines along the north side of the Southern Pacific right-of-way. Reclamation District easements are located between the Southern Pacific right-of-way and Interstate 80 Business, and between the Deepwater Ship Channel and the Main Drainage Canal at Thorp Road.

Freeways

Interstate 80 and Interstate 80 Business present further constraints to development of a path system. Crossings occur only at streets and most are too narrow to accommodate bicyclists. At Interstate 80, crossings are limited to West Capitol Avenue, Reed Avenue, and Riverbank Road. Crossings at Interstate 80 Business only occur at Harbor Boulevard, Jefferson Boulevard, and West Capitol Avenue.

III. OBJECTIVES AND POLICIES

The objectives and policies of the Bicycle and Pedestrian Path Master Plan define the City of West Sacramento's intent to develop a system of public bicycle and pedestrian paths for the residents of West Sacramento. The objectives are broad statements that convey the general purpose of the Master Plan, while the policies outline specific guidelines to be followed in developing the system.
The objectives and policies include the goals and policies concerning bicycle and pedestrian paths addressed in the City's General Plan Policy Document adopted May 3, 1990. These goals and policies of the General Plan are presented under the headings of Transportation and Circulation, and Recreational and Cultural Resources.

OBJECTIVE 1: TRANSPORTATION ALTERNATIVES

Facilitate bicycle and pedestrian travel as alternatives to automobile use.

Policies

1.1 Develop and maintain a safe continuous and convenient system of bicycle and pedestrian paths that connect residential areas to major destinations within the City, including the central business district, shopping areas, employment areas, and public facilities.

1.2 Coordinate with Yolo Transit to integrate bicycle and pedestrian facilities with bus service.

1.3 Connect bicycle and pedestrian paths to bus routes, and provide bicycle I parking at strategic bus stops and commuter park and ride lots.

1.4 Provide bicycle parking at all new public facilities, and upgrade existing facilities when making other improvements.

1.5 Require bicycle at all new shopping parking centers and business developments that will serve as employment areas, and at existing shopping centers and business developments when upgraded.

OBJECTIVE 2: USE OF CITY INFRASTRUCTURE

Utilize city infrastructure including streets, street and railroad rights-of-way, and utility and drainage easements for development of bicycle and pedestrian path system.

Policies

2.1 Provide bicycle and pedestrian facilities at all new bridge, railroad, and freeway crossings, and provide a barrier to separate all faculties from vehicular traffic lanes.

2.2 Provide separation of bicycles and pedestrian facilities from vehicular traffic, wherever possible, when planning improvements to existing streets.

2.3 Utilize street driving surfaces and shoulders of existing streets for bike lanes where retrofit of bike facilities, separated from the street, are unfeasible.

2.4 Limit bike lanes on streets to locations where street width and traffic volumes permit safe operation of bicycles with motor vehicles. Provide separate lanes for bicycles on collector or residential streets that link arterial streets; and where separate lanes are not feasible, designate routes without providing lanes, but only on streets with low traffic volumes.

2.5 Adopt Caltrans standards, as required by state law, for bike paths (Class I), bike lanes (Class II), and bike routes (Class III).

2.6 Provide bike paths and sidewalks, separated from each other and vehicular traffic, at all new arterial and collector streets.

2.7 Utilize non-vehicular areas, wherever possible, for locating bicycle and pedestrian facilities away from motor vehicles, to enhance safety and enjoyment and minimize distances between destination points. Utilize Reclamation District rights-of-way and maintenance roads for paths wherever feasible, and negotiate easements for paths as needed.

2.9 Utilize railroad rights-of-way and utility easements for paths wherever feasible and negotiate easements for paths as needed.

2.10 Obtain easements for bicycle and pedestrian paths from new developments, as needed, and require all new developments to share implementation costs of path system.

2.11 Reserve all walks along city streets for pedestrians only.

OBJECTIVE 3: RECREATIONAL OPPORTUNITIES

Facilitate city-wide and regional recreational opportunities for bicycling, hiking and jogging.

Policies

3.1 Link city parks, schools, riverfront, open space areas, and scenic areas to the system of bicycle and pedestrian paths.

3.2 Provide a sYstem of continuous bicycle and pedestrian pathways along the Sacramento River and other waterways, where feasible.

3.3 Ensure linkage of bicycle and pedestrian paths with path systems outside the City, both existing and planned, by coordinating with SACOG and all appropriate public agencies.

3.4 Provide convenient staging areas and rest facilities at appropriate intervals along the entire bicycle and pedestrian path system.

3.5 Pursue joint use agreements to use parking facilities at local schools as staging areas.

3.6 Allow multi-purpose paths in recreational areas to eliminate costly construction of paths for separate uses.

3.7 Identify and avoid paths with blind ends and give priority to development of loop paths in recognition that users create loops in preference to back tracking.

OBJECTIVE 4: ACQUISITION, IMPLEMENTATION AND MAINTENANCE

Provide detailed planning and implementation of the path system as directed by the Department of Public Works and Department of Parks and Community Services.

Policies

4.1 Ensure public participation in the planning and design of projects for pedestrian and bicycle facilities.

4.2 Ensure consistency of actual construction with standards and design guidelines.

4.3 Minimize land use conflicts between the public path system and adjacent private property.

4.4 Encourage neighborhood and commercial involvement in planning and development of the path system.

4.5 Preserve natural vegetation, wherever possible, and provide low maintenance, drought-tolerant planting along paths as needed for climate amelioration, buffering and aesthetic enhancement.

4.6 Acknowledge visibility requirements of users in design of planting and preservation of natural vegetation.

4.7 Exclude motorized vehicles from path system, except for motorized handicap devices, and maintenance, patrol or emergency vehicles.

4.8 Implement and maintain marking, striping and signing for bike paths, lanes and routes.

4.9 Encourage and designate no parking on streets with lanes or routes for bicycles.

4.10 Make safety, security, and visibility of users the priorities for design of the path system.

4.11 Include path improvements in the City's annual capital improvement ~i ~ program.

4.12 Actively seek and obtain funding and grants for path construction from all

available sources, including state and federal agencies.

IV. STANDARDS AND DEFINITIONS

The following standards and definitions apply to the design and construction of all elements of the Bicycle and Pedestrian Path Master Plan. The bicycle path system will consist of Bike Paths, Bike Lanes and Bike Routes, and to a lesser extent, Recreation Trails. The pedestrian path system is composed of Recreation Trails, which will accommodate bicyclists and pedestrians as well as other activities, and a Pedestrian Path for pedestrians only.

The primary purpose of Bike Paths, Bike Lanes, and Bike Routes is to serve transportation needs. A comparison of these bikeway facilities is shown in Figure 5. Bicyclists may also utilize Recreation Trails for transportation routes, since these offer direct connections between distant parts of the City.

BIKE PATHS (Caltrans Class I Bikeways)

Bike paths shall conform to the standards for Caltrans Class I Bikeways as modified herein and shown in Figure 5. A bicycle path is defined as a .facility for the exclusive use of bicycles, generally used to serve corriders not served by streets, or where street rights-of way exist in sufficient widths to permit construction of such a facility away from the influence of the adjacent street.

Bike paths should offer opportunities not provided by the road system, such as recreational opportunities or direct commuter routes if cross flow by motor vehicles is minimized. Common applications include riverfronts, utility rights-of-way, circulation inside parks, and connections between parks. The use of skateboards and roller skates, including in-line skates or "roller blades", should be prohibited on bike paths as a safety precaution.

Width

The minimum paved width for a two-way bicycle path shall be 10 feet, and an additional, level, graded area of 2 feet minimum shall be provided on both sides of the path. In high traffic areas the paving width shall be increased to a minimum of 12 feet. A separate path shall be provided for pedestrians in order to minimize conflicts between bicycles and pedestrians, and shall be identified by contrasting paving materials, such as concrete for pedestrians and asphalt for bicycles. Use of paving materials shall be consistent throughout the City for visual identity and continuity.

Clearance

A minimum 2-foot clearance to obstructions shall be provided adjacent to the pavement. A 3-foot clearance is recommended, but may be reduced accordingly if the path width is greater than the minimum required. Adequate clearance is desirable regardless of path width. Where path pavement is contiguous with a fixed object such as a wall, a 4 inch white edge stripe is recommended, I foot from the fixed object, to minimize likelihood of a bicyclist colliding with it.

The clear width for a path on a structure, between railings, shall be a minimum of 8 feet. A clear width equal to the minimum width of the path including graded side areas, or 14 feet, is desirable.

The vertical clearance to obstructions across the full width of the path, including graded side areas, shall be a minimum of 8 feet.

Striping and Signage

A centerline composed of a yellow stripe, 4 inches wide, may be used to separate opposing directions of travel. A 3 foot stripe with a 9 foot space between stripes is recommended. A centerline is particularly beneficial at heavy use areas, on curves with restricted sight distance, and for nighttime riding. Standard highway regulatory, warning, and guide signs, scaled down in size as needed, may be used on bike paths, .as well as specially designed signage for specific needs.
Warning markings consisting of words or symbols painted in white on the pavement, may be used to alert bicyclists to approaching hazards, such as sharp curves, and barrier posts.

Intersections at Roadways

Intersections are a prime consideration in bike path design and should be a determining factor in choosing between alternate routes. At roadways with heavy vehicular and bicycle traffic, grade separations are desirable. If separation is not possible, traffic signals should be considered. Stop or yield signs for bicycles may suffice where vehicular traffic is not heavy. At arterial streets, the bicycle crossing should occur at the pedestrian crossing where motorists can be expected to stop, or at a location completely out of the influence of any intersection, to permit adequate opportunity for bicylcists to see turning vehicles. Curb cuts should be provided where the bike path intersects the roadway, that are flush with the street and of sufficient width to accommodate adult tricycles and two-wheel bicycle trailers.

Yield signs, stop signs, or traffic signals that can be activated by bicyclists should be used to assign right of way at mid-block crossings, and curb cuts should be installed for bicyclists where paths cross streets. Stop or yield signs for bicyclists should also be placed at bicycle street crossings that are located within or adjacent to pedestrian crossings. Bike path signage at these crossings should be

shielded from vehicular traffic to avoid confusion for motorists. Traffic signs indicating bike crossings may be placed in advance of the crossing to alert motorists.

Set-backs and Barriers

Bike paths should not be located immediately adjacent to roadways or railroads, or in roadway medians. A wide separation is recommended between bike paths and adjacent roadways or railroads as shown in Figure 6. Paths closer than 5 fee roadway travel lane and all paths adjacent to railroads include a physical barrier to prevent encroachment by path users. Bike paths should also be separated a minimum of 5 feet from sidewalks and other paths.

Barriers should be a minimum of 5 feet in height and should consist of fencing 3 material, such as chain link. Dense shrubs may be used instead of fencing, at roadways only. Low barriers are not recommended since bicyclists could fall over the barrier and into oncoming traffic. Where motorists may encroach into the bike path, an automobile barrier such as concrete or steel guard railing should be provided.

Design Speed and Geometry

The proper design speed for a bike path is dependent on the expected type. of use and on the terrain. The maximum design speed shall be 20 miles per hour. Use of obstructions such as "speed bumps", intended to slow down bicyclists in advance of intersections, cannot compensate for improper design and should not be used.

Minimum recommended curve radii and superelevations for design speeds are shown in CalTrans Figure 1003.1C included in the appendix of this document. Increased pavement width on the inside of the curve is recommended when minimum curve radii are selected to compensate for leaning bicyclists. A straight cross slope of 2 percent is recommended on tangent sections. Super elevations steeper than 2 percent should be avoided on bike paths with adult tricycle traffic.

Stopping sight distance shall be determined by the descending direction of travel. Minimum stopping sight distances for design speeds and grades, and minimum lengths of crests for vertical curves are shown in Figures 1003.1D in the appendix. Figure 1003.1E in the appendix indicates the minimum clearances to line of sight obstructions for horizontal curves. Required lateral clearance is determined by entering Figure 1003.1E with the stopping sight distance from Figure 1003.1D and the proposed horizontal curve radius.

Grades

Steep grades should be avoided on bike paths since novice bicyclists are generally unable to negotiate long, steep uphill grades and often ride poorly-maintained bicycles that may be dangerous on long downgrades. The maximum grade recommended for bike paths is 5 percent. Sustained grades should be limited to 2 percent if a wide range of riders is to be accommodated. Steeper grades can be tolerated for short segments of approximately 500 feet. Where steeper grades are necessitated, the design speed should be increased and additional width should be provided for maneuverability.

Structural Section

A bike path should be designed with consideration given to the quality of the subgrade and anticipated loads, principal loads normally being from maintenance and emergency vehicles. Expansive soil should especially be considered in the structural design. Minimum pavement thickness of 2 inches of asphaltic concrete, Type "A" or Type "B" per California Department of Transportation Standard Specifications (DTSS) with I /2 inch maximum aggregate and medium grading, is recommended. The asphalt content may be increased to lengthen pavement life and the subgrade sterilized to prevent weed growth through pavement.

Drainage

A bike path should have a cross slope of 2 percent, preferably in one direction to simplify longitudinal drainage design and surface construction. On hillsides, a drainage ditch designed to intercept hillside drainage may be needed on the uphill side of the bike path, and catch basins or culverts to carry intercepted water under the path. Culverts or bridges are also needed where the path crosses a drainage swale or channel.

Bollards

Bollards may be needed at bike path entrances from roadways and parking areas to prevent motor vehicles from entering. Bollards should be designed to be removeable so emergency and service vehicles may enter, and should be visible by day or night and well marked with such devices as reflectors or reflectorized tape. Striping around bollards is recommended as shown in Figure 7. If sight distance is limited, warning signs or painted pavement warnings should be provided in advance.

A 5 foot clear space should be provided between bollards to permit passage of bicycletowed trailers and adult tricycles, and to assure adequate room for safe passage of bicycles without dismounting. Closer bollard spacing, needed to bar motorcycle entry, should only be used where extreme problems with motorcycles

are encountered, since closer spacing presents safety and convenience problems for bicyclists.

BIKE LANES (Caltrans Class II Bikeways)

Bike Lanes shall conform to Caltrans Class II Bikeways as modified herein and shown in Figure 8. Bike Lanes are defined as a striped lane for one-way bicycle travel along each side of a roadway, where there is significant bicycle demand and distinct needs that can be served. Bike Lanes are intended to improve conditions and better accommodate bicyclists on existing roadways, where insufficient room exists for safe bicycling, by assigning and delineating separate right of ways to bicyclists and motorists to provide for more predictable movements by each.

Methods of adding Bike Lanes to existing streets include reducing the number of traffic lanes for motorists, narrowing traffic lanes from the typical 12 feet to 11 feet,_ and prohibiting parking. Consideration should be given to factors such as vehicle speeds, truck volumes, alignment, and sight distance in determining the appropriateness of narrowing motor vehicle lanes.

If bicycle traffic is to be controlled by delineation, efforts should be made to assure that high levels of service are provided the bike lanes, including surface - improvements, augmented sweeping programs, special signal facilities, signage and pavement markings. Stripes alone will not measurably enhance bicycling.

Width

All bike lanes shall be one-way. Figure 8 shows typical configurations for bike lanes on curbed roadways where parking is permitted (with and without parking striping), and where parking is prohibited, as well as on uncurbed roadways Bike lanes shall not be placed between the parking area and the curb, due to increased conflict between bicyclists and car door openings, reduced visibility at intersections, prevention of effective maintenance, and prevention of left turns by bicyclists. Where parking is permitted, not extensive, and turnover of parked cars is infrequent, the indicated width of 11 or 12 feet shall be the minimum width of bike lanes. However, if parking is substantial or turnover is high, additional width is recommended.

Bike lanes where parking is prohibited are generally the most desirable since potential conflicts resulting from auto parking and car door openings are eliminated. The minimum width shall be 4 feet as indicated, and shall be 5 feet if including a typical 2 foot gutter. At least 3 feet shall be provided between the traffic lane and the longitudinal joint at the concrete gutter, since the gutter does not provide a suitable riding surface and the longitudinal joints of the gutter may not always be smooth. Bicyclists should not be expected to ride in the gutter, so

3 feet must still be provided should there be gutters that meet the 4-foot minimum width.

Bike lanes, where parking is prohibited only during certain hours, should be considered only if the majority of bicycle travel will occur during the hours of prohibited parking, and shall be allowed only in conjunction with signing, that designates the hours bike lanes are effective, and a firm commitment to enforcement.

Bike lanes on roadways without curbs and gutters should be supplemented with R25 (park off pavement) signs or R26 (no parking) signs. Additional width to the minimum shown for bike lanes is desirable, particularly where motor vehicle speeds exceed 40 miles per hour.

One-way Steets

Bike lanes on one-way streets should be located on the right side of the street, since locations on the left side would require bicyclists and motorists to cross paths when making left turns onto two-way streets.

Steep Grades

Bike lanes are not advisable on long, steep downgrades, where bicycle speeds greater than 30 miles per hour are expected. Additional width should be provided when striping bike lanes on steep grades to accommodate higher bicycle speeds. As grades increase, bicycle speeds can approach those of motor vehicles, and bicyclists will generally move into the motor vehicle lanes to increase sight distance and maneuverability.

Striping and Signage

Standard signing and pavement markings for bike lanes are show in Figure 9. The R81 Bike Lane sign shall be placed at the beginning of all bike lanes, on the far side of every arterial street intersection, at all major changes in direction, and at maximum half-mile intervals. The G93 Bike Route sign may be used primarily for directional and destination signing, only where needed so a proliferation of signs serving no purpose is avoided. Many roadway signs will also apply to bicyclists in bike lanes. Standard regulatory warning and guide signs for use in conjunction with bike lanes can be found in the CalTrans Traffic Manual.

Bike lane pavement markings shall be placed on the far side of each intersection, and may be placed at other locations as needed. Raised pavement markers or other raised barriers shall not be used to delineate bike lanes. These markers and barriers restrict or increase the difficulty of bicyclists entering and exiting bike lanes, and prevent or discourage motorists from merging into bike lanes before making right turns, as required by the Vehicle Code. Thermoplastic paint should

not be used for pavement marking since the paint surface is extremely slippery under wet pavement conditions.

Intersections

Most auto-bicycle accidents occur at intersections; therefore the design of bike lanes at intersections should minimize confusion by motorists and bicyclists and permit both to operate in accordance with normal rules of the road. Common movements of motor vehicles and bicycles at a typical intersection on a multilane roadway are shown in Figure 10. Left turning bicyclists must cross motor vehicle traffic lanes from both directions, since the bike lane is on the right side of the roadway. Some bicyclists are proficient enough to merge across one or more traffic lanes to use the inside lane, or if existing, the left turn lane for motor vehicles. Those who are not comfortable doing so have the option of riding, or dismounting and walking, their bikes in the pedestrian crosswalk.

Where there is a bike lane and traffic-actuated signal, installation of bicycle-sensitive detectors within the bike lane is desirable. Bicyclists must stop to actuate push button detectors, so these are not as effective as pavement detectors. Detectors in left turn lanes for motor vehicles should also be sensitive enough to detect bicycles. Designs for bicycle-sensitive detectors are shown in Chapter 9 of the Caltrans Traffic
Manual and in the Standard Plans, both of which are included in the appendix of this document.

Right-turn-only Lanes

At intersections with right-turn-only lanes, bicyclists will have to merge with right turning motorists. Since bicyclists typically travel at speeds less than motorists, they should signal and merge where there is sufficient space in right-turning traffic rather than at a predetermined location. Therefore, delineation of the bike lane should either be dropped at the approach (or off ramp) completely, or a single, dashed line extended across the right-turn lane. A pair of parallel lines is not recommended, since these will encourage bicyclists to cross at a predetermined location or to assume they have the right of way instead of checking for right turning traffic.

BIKE ROUTES (Caltrans Class III Bikeways)

Bike routes shall conform to Caltrans Class III Bikeways as modified herein. Bike routes can provide continuity to the bikeway system along through routes where bike paths or lanes cannot be provided. Bike routes designate bicycle useage that is shared with and secondary to motor vehicles, and are established by signage, not by pavement markings. In areas where there is no parking, a 4 inch white edge stripe separating the traffic lanes from the roadway shoulder can help provide safer shared use. Bike routes, like bike lanes, should offer an advantage to undesignated routes. They should only occur where motorized traffic volumes

and speed are low enough for safe sharing with bicycles and should be maintained to meet the needs of bicyclists.

Width

A prescribed width for bike routes is not established since adequate width is dependent on many factors, including the volume and character of vehicular traffic on the road, typical speeds, vertical and horizontal alignment, sight distance, and parking conditions. Traffic and parking conditions must be carefully considered when determining if a route can serve bicycles.

Locational Criteria

Bike routes should offer a higher degree of service than alternative streets as determined by the fulfillment of most of the following criteria. A route that is appropriate for bicycles should:

1 Provide for through and direct travel in bicycle-demand corridors.
2 Connect discontinous segments of bike lanes.
3 Provide traffic control devices (stop signs, signals) to give greater priority to bicyclists than occur on other streets, such as bicycle sensitive detectors on the right-hand portion of the road where bicyclists are expected to ride.
4 Remove or restrict street parking in areas of critical width to provide improved safety.
5 Correct paving surface imperfections or irregularities, including utility covers and potholes.
6 Provide a higher standard of maintenance than other streets, including more frequent street sweeping.

Bike Routes on Sidewalks

The use of sidewalks for bike routes should only be considered where extremely unsafe conditions exist, including:

1 High speed or heavily traveled roadways where continuity in the bikeway system is needed and inadequate space exists for bicyclists.
2 Narrow bridges, overcrossings and undercrossings.

When sidewalks are used for bike routes under the above conditions, unnecessary obstacles should be removed and there should be infrequent interruptions by driveways or intersections for long distances. If possible, the segment of the walk being used for bicycles should be widened to 12 feet. Whenever bicyclists are directed from street to sidewalk level, and from walls to street level, curb cuts should be provided that are flush with the street. Curb cuts should be wide enough to accommodate adult tricycles and two-wheel bicycle trailers.

Bike Routes on sidewalks shall conform to the requirements for "Clearance" set r, 77
forth under Bike Paths for bridge and overcrossing railings and undercrossing retaining walls. The requirements for "Set Back and Barriers" set forth under Bike Paths shall also apply to the above conditions.

Signage

Bike routes are established by placement of the G93 Bike Route sign. Bike Route signs should be placed at both ends of the route, at the far side of every major street intersection, at changes in direction, and periodically along the route at a maximum of half mile intervals. At changes in direction, the signs should be supplemented with G33 directional arrows. The addition of a special destination sign plate can increase the function of the Bike Route sign and is recommended where a bike route leads to high demand destinations, including shopping centers, waterfronts, community parks, and community centers. Bike route signage is shown in Figure11. Standard warning and guide signs used on roadways in conjunction with bike routes can be found in the Caltrans Traffic Manual.

ADDITIONAL BIKEWAY CRITERIA

The following Bikeway criteria applies to Bike Paths, Bike Lanes, and Bike Routes, as may be appropriate.

Bridges

Bikeway bridges must be compatible with the type or class of bikeway being served so bicyclists are not required to cross the roadway to access the bridge. Bike Lanes should be accomodated by separate crossings on both sides of the bridge. Bike Paths should be provided with a two way crossing on the same side of the roadway as the path.

A physical barrier should accompany all bikeway bridge crossings and should be a minimum of 5 feet in height to minimize the likelihood of bicyclists falling over the barrier. Existing bridge structures utilized for bikeways should be retrofitted with new railings or additional railing material, such as lightweight upper railing or chain linkfencing. Barriers should minimize fixed hazards to motor vehicles, and if the bridge is an interchange structure, sight distance restrictions at ramp intersections should also be minimized.

Separate structures for bikeways shall conform to Caltrans' standard pedestrian overcrossing design load of 85 pounds per square foot, and the minimum clear width shall be the paved width of the approach bikeway. If pedestrians are to use the structure, additional width is recommended.

Surface Quality

Bikeway paving should be smooth and free of potholes, with a uniform pavement edge. For rideability, the finished surface of bikeways on new construction should not vary more than 0.02 feet in 8 feet, in any direction. Figure 12 indicates the recommended bikeway surface tolerances for Bike Lanes and Bike Routes developed on existing streets to minimize the potential for loss of control by bicyclists. The ' stricter tolerances cited previously should be achieved on all, new bikeway construction.
Elements that occur in bikeway paving, including grates, grating material, covers, and driveways; should be designed and installed to provide a safe, continuos riding surface for bicyclists, and should be maintained flush with pavement when resurfacing. Grates and grating material shall have openings narrow and short enough, such as reticuline type, to ensure that bicycle tires will not drop into openings, regardless of the direction, of bicycle travel.

Where replacement of existing material is not feasible, I inch by 1 /4 inch steel cross straps may be welded at 6 to 8 inches on center to adequately reduce the size of openings. Retrofitting of pavement elements is recommended on all roadways where bicycle travel is permitted, whether or not bikeways are designated.

Driveway construction should avoid construction of a vertical lip from the driveway to the gutter, as the lip may create a problem for bicyclists entering from the roadway at a flat angle. The height of the lip, if deemed necessary, should be limited to 1 / 2 inch.

Railroad Crossings At-grade

Bicycle crossings of railroads at-grade should be at least as wide as the approach bikeway and should be straight and at right angles to the railroad tracks. For onstreet bikeways that do not cross at right angles, the bikeway should be widened, if possible, to create a right angle crossing as shown in Figure 13. If not possible, special construction and materials should be considered to keep the flangeway depth and width to a minimum. Pavement maintenance should include removal of buildup next to rails that creates ridges, and installation of timber planking and other materials for smoother crossings should be considered. The California Public Utilities Commission (CPUC) regulates all railroad crossings and all new crossings are subject to approval by the Commission. Additional railroad protection may be required as determined in a joint field review with the railroad company and CPUC.

Hazard Markings

Vertical barriers and obstructions, including abutments, piers, and other features causing bikeway constriction, should be clearly marked to gain the attention of approaching bicyclists. Hazard markings should only be used where obstructions

are unavoidable and should not be considered a substitute for good bikeway design. Acceptable hazard marking is shown in Figure 14. Other markings, including signs, reflectors, and diagonal black and yellow striping; may be used for alerting bicyclists to potential hazards not causing bikeway constriction.

Lighting

Bikeway lighting should be considered where night riding is expected. Of particular importance are bike paths that serve as commuter routes with high frequency usage at night, such as paths leading to colleges. Bikeway street crossings and underpasses should also be adequately lighted. Normally, on-street bikeways will be adequately lit where street lighting is present.

RECREATION TRAILS

Recreation trails are multipurpose pathways that accomodate a wide range of activities, including hiking, jogging, and bicycling. These trails generally do not follow the designated path of roadways. The paved width of the trail should be a minimum of 10 feet and should be appropriate in width to the anticipated level of activity. In special use areas within parks and in urban parks along the River, recreation trails may transition to a wider, paved plaza or promenade. Trails should also be signed at appropriate locations to restrict motor vehicles. Recreational Trails should also meet the standards for Bike Paths since bicycling will be a primary use of the trail. Recreation trails in railroad rights-of-way shall include minimum setbacks from the railroad tracks and barriers as defined for Bike Paths.

Recreation Trails on Levees

Development of recreation trails within Reclamation District easements is subject to approval by the Reclamation Board, and generally requires submittal of plans for proposed work with an application to the Board for permit. Recreation trails on levees, therefore should be consistent with the Reclamation Board "Standards for Encroachments" April 1976, and "Policy on Bicycle Trails on Levees" adopted June 21 , 1991, as subject to Reclamation Board approval. The following information is based on Board requirements.

Paved trails for bicycles shall be designed in accordance with design standards for State highways and County roads. Trails for bicycles shall have a minimum width of 12 feet and a minimum shoulder width of 1 foot on each side of the pavement. and shall consist of a minimum of 6 inches of aggregate base beneath 2 inches of asphalt concrete pavement, or equivalent. Trails on the levee slopes are not permitted, except for access ramps. Trails and access ramps shall slope away from the levee crown.

All patrol roads must be maintained for use by the Reclamation District. Unauthorized vehicular access shall be prevented by a physical barrier that is removable to allow access for maintenance, inspection, and emergency vehicles. Barriers shall be secured by locks, and keys provided to the Department of Water Resources and the local flood control maintaining agency.

Ramps must be constructed of imported material. Cuts into or reshaping of the levee, in any manner, is expressly prohibited. No excavation or cuts are allowed on the Sacramento River levees from November 1 to April 15. Removal of any borrow material from levees, and deposit of embankment, spoil and/or waste materials requires a permit. Retaining walls if justified for engineering, must be of reinforced concrete or of a concrete gravity section designed to withstand the weight and pressure of the fill they are to retain.
The permittee or public agency responsible for any trail shall defend and hold the Reclamation Board and local flood control-maintaining agency harmless from claims that arise out of the use of the trail. The permittee shall submit notice that the permittee does not convey any interest in real property connected with the trail, and shall assume maintenance of all improvements to a condition satisfactory to the Board. The permittee shall adopt and enforce use restrictions, subject to the Board's approval, and as a minimum, shall restrict public access to designated areas only and prohibit equestrian and vehicular access. Permanent signs shall be provided at all trail access points to levees and at periodic intervals along trails located on levees identifying the trail as a "Levee Maintenance Road" and instructing users to "Watch for Patrolling Vehicles".

A typical floodway section is shown in the Reclamation Board Standards, Plate No.1, and plans for two common types of ramps in Plate No. 5, both of which are included in the appendix of this document. Levee structure and nomenclature are also discussed in Chapter II of "Interim Guide for Vegetation on Flood Control Levees", adopted September 16, 1988 by the Reclamation Board, which is also included in the appendix.

Steps on Levees

Access steps on the riverside or landside of the levee must be constructed of concrete, rock, or brick embedded in concrete, and must be built flush with the levee slope. Cuts in the slope shall not exceed 12 inches in depth. Steps shall be a maximum of 4 feet in width and shall not extend above the levee crown. Existing stone protection, if disturbed, shall be restored to original condition. Wooden steps may be permitted at locations where the landslide slope of the levee is landscaped under permit and maintained by the owner. Wooden steps must be constructed on, not in, the levee slope. A ramp, 6 inches wide, should be constructed adjacent to the steps to facilitate transport of bicycles along the steps.

Walkways on Levees

Concrete and wooden walkways with handrails are permitted on both sides of levees if they do not unduly interfere with levee maintenance. The bottom of the walkway stringers on the riverside slope must be 2 feet above the design flood plane elevation. Existing stone protection, if disturbed, shall be restored to its original condition. Handrails may not be constructed on the levee crown. On a levee with a crown width less than 14 feet, handrails must be a minimum of 8 feet from the levee centerline. Walkway supports must be constructed to minimize the possibility of catching drift.

Planting and Irrigation on Levees

Vegetation retained or planted on levees is also subject to permit and is outlined in the "Interim Guide for Vegetation on Flood Control Levees", adopted September 16, 1988 by the Reclamation Board. Planting must be carefully considered for functional requirements of protection against wavewash, improvement of wildlife habitat, improvement of esthetics, and enhancement of overall environmental quality. The guidelines generally restrict vegetation other than grasses and certain ground covers from standard-sized levees. Trees are permitted on oversized levees subject to maintaining visibility for inspection purposes.

Vegetation retained or planted on levee slopes may be hand-watered; however, any water applied on the levee shall be applied so as to prevent erosion. No irrigation ditches, dug into the levee slope, are allowed, and excavation for watering basins shall be limited to a maximum depth of 12 inches. All irrigation and drainage conduits through levees must be installed with the pipe invert or bottom of conduit above the design flood plane. Permanent sprinkler systems are permitted only on the landside slope of the levee. Irrigation pipes must be an approved material, such I as galvanized, plastic, or copper. Piping shall be buried no deeper than 8 inches in the levee slope. The supply line must contain an. accessible control valve located a minimum of 10 feet landward of the levee toe, with the location clearly marked for maintenance personnel.

V. Master Plan

The Bicycle and Pedestrian Path Master Plan includes Bike Paths, Bike Lanes, Bike Routes, and Recreation Trails as defined in Chapter IV. Figure 15, Priority A Implementation, illustrates an initial plan that can be implemented under current conditions without major improvements to the City's infrastructure.

The Master Plan Diagram, Figure 16, illustrates the complete development of the Master Plan. Complete development is based on buildout of undeveloped areas and City infrastructure, including roads and bridges, per the existing framework plan for undeveloped areas outlined in the City's General Plan Policy Document.

Those portions of the Master Plan Diagram not shown in Priority A Implementation are classified as priority B and C implementation projects. Numbers shown on Figures 15 and 16 correspond to numbers for portions of the plan, or "projects", that are shown in Figure 20 and prioritized as "A", "B", and "C". A cost estimate for each project is also included in Figure 20. Priority A projects might occur within the next five years if funding is available, while priority B projects might not occur for ten to fifteen years, and priority C projects for fifteen to twenty years or more.

RECREATION TRAILS

The recreation trail locations shown in the Priority A Implementation Plan create extensive opportunities for development of recreational facilities for pedestrians and bicyclists. The majority of these locations are on Reclamation District easements which are currently available for trail development. These easements include areas along the Deep Water Ship Channel, Main Drainage Canal, Morton Canal, Sacramento and Yolo Bypasses, and the Sacramento River, north of the Boat Ramp.

A recreation trail, classified as priority A, is also indicated in the PG&E easement located west of Harbor Boulevard and in the Union-Pacific Railroad right-of-way south of the Barge Canal. Although land acquisition may be required by Union-Pacific, a priority A trail is shown in this location because it will provide an alternative to Jefferson Boulevard for north-south circulation and will not require costly construction of grade separations for railroad crossings.

Future Recreation Trails

Locations of recreation trails scheduled as priority B projects include the Sacramento River levee, south of the Boat Ramp and north of the Barge Canal, the Reclamation District easement, and a trail connection between the River levee and the Main Drainage Canal. Redevelopment will most likely occur adjacent to the River levee within the next ten years, and a trail could be included in this private development at no cost to the City.

The trail in the Reclamation District easement is scheduled as priority B since this location is isolated from other priority A Portions of the path sYstem. The Reclamation District recreation trail will prove more useful if coordinated with other priority B projects that provide linkage to the path system, such as the bike lanes proposed for West Capitol Avenue.

Recreation trails classified as priority C consist of project locations that are dependent on long range planning, or include costly construction elements and land acquisition. Construction of the recreation trail along the Sacramento River, south of the Barge Canal, is dependent on the long range planning goal of realigning South River Road as indicated in the General Plan Circulation

Diagram. The trail along the north bank of the Barge Canal, and the trail along the Union-Pacific Railroad north of the Barge Canal, should be coordinated with long range plans to relocate the railroad tracks from these areas. Trails along both the Union-Pacific and Southern-Pacific railroads also incur costly construction. Crossings under railroad grades will need to be constructed at two locations and land acquired, since the railroads will most likely not consider granting an easement for trail construction. Railroad crossings are discussed in further detail in a following section.

BIKE PATHS (CalTrans Class I Bikeways)

Most bike paths are classified as priority C projects due to their dependence on new roadway construction. This is evident by the predominance of bike paths located in the existing undeveloped area of Southport. The absence of bike paths in the northern half of the City reflects the predominantly built-out condition of the Bryte, Broderick, and West Sacramento areas.

The City Standard Street Cross Section shown in Figure I-2 of the General Plan Policy Document does not designate adequate widths of street right-of-ways for construction of bike paths. It is recommended that the General Plan be amended per Figure 17 so that adequate width will be provided on new city streets to accommodate bike paths. The right-of-way for all new arterial streets, both major and minor, and all collector streets in the City of West Sacramento should be established per the Amended Street Cross Section Standards.

Two bike paths that are classified as priority A and B, instead of priority C like all other bike paths, are located along the proposed alignment for Sutterville Road and the proposed extension of Marshall Road. The Marshall Road path would logically be scheduled to coincide with the priority B development of a community park proposed for Marshall Road at the Deep Water Ship Channel. The Sutterville Road path is classified as priority A since construction of Sutterville Road is projected to occur within the next five years.

BIKE LANES (Caltrans Class II Bikeways)

Opportunities exist for immediate implementation of bike lanes on city streets of sufficient width for this purpose, and for future development on streets with rights of way that are wide enough for street improvements including bike lanes.
The addition of bike lanes to existing streets is accompanied by the prohibition of parking in most bike lane locations, due to insufficient right-of-way width for both bike lanes and parking. The prohibition of on-street parking is generally recommended as an acceptable means of implementing bike lanes if other alternatives do not exist, because parking on arterial and collector streets is not a high priority for transportation or transportation safety. Parking is currently prohibited intermittently in bike lane locations shown on the plan where parking must be prohibited to accommodate bike lanes, and only a few businesses in

these locations appear to currently need on-street parking. Existing streets that are planned for widening within five years should be planned to include bike lanes and to retain existing parking. In general, parking must be prohibited for bike lane locations shown for priority A implementation; however, C Street and Park Boulevard are currently wide enough to accommodate ~ bike lanes without prohibiting parking:

Sacramento Avenue and Jefferson Boulevard, from Sacramento Avenue to Interstate 80 Business, are currently striped along the street edge and signed as a bike route. These locations can easily be converted to bike lanes with the addition of striping, pavement markings and signage, per Caltrans standards defined in Chapter IV of this document. .

In addition, locations where parking is currently prohibited or does not occur include:

1) Reed Avenue, Riverside Parkway, and Stillwater Road,
2) Harbor Boulevard, south of West Capitol Avenue,
3) Industrial Boulevard,
4) Linden Road, west of Jefferson Boulevard,
5) Seaport Boulevard and Parkway Boulevard.

The bike lanes proposed for Linden Road, west of Jefferson Boulevard, will replace existing bike paths that are substandard. The existing bike paths are recommended
for conversion to pedestrian use only due to insufficient width for two-way bike Streets that are planned for widening within five years, and therefore can be planned to accommodate bike lanes are: Enterprise Boulevard, and Harbor Boulevard north of West Capitol Avenue.

Bike lane locations planned for priority A implementation where parking must be prohibited include: Fifth Street and West Acre Road.

Priority B Bike Lane Projects

Bike 1 lanes that are scheduled as priority B projects, in order to coincide with street widening that will most likely occur within ten years, are located at,

1) Linden Road, east of Jefferson Boulevard
2) Jefferson Boulevard, south of I-80 Business (Parking is currently intermittently prohibited in this location)
3) West Capitol Avenue
4)

Parking must also be prohibited at West Capitol Avenue and a portion of Jefferson Boulevard, immediately south of I-80 Business, since existing street right-of-way width is apparently insufficient to accommodate street widening, bike lanes and parking. Existing parking is intermittently prohibited in these locations.

Bike lanes at Evergreen Avenue and Merkley Avenue are scheduled as priority B projects, because these locations are dependent on other priority B projects for linkage to the path system, especially the West Capitol Avenue bike lane. The bike lane rat South River Road, north of the Barge Canal, is scheduled as priority B to coincide with redevelopment south of the Boat Ramp that will most likely occur within ten years.

Bike lanes yes a t Davis Road, east of the Union-Pacific Railroad, and Fifteenth Street are scheduled .for priority C projects since street widening will probably not occur within ten nears and the existing streets cannot accomodate bike lanes, even if parking is prohibited.

BIKE ROUTES (Caltrans Class III Bikeways)

Purpose of bike routes is to provide continuity between Bike Paths, Bike Lanes, end Recreation Trails where opportunity does not exist for development of these other types of path system facilities. Bike routes can also provide an interim link between priority A projects for creation of a cohesive priority A path system, without construction of major street improvements.

Bike routes listed below will be permanent locations for bike routes where insufficient right of ~ way widths preclude development of other types of facilities, and prohibiting on-street parking is not desirable because locations are in residential areas.

1) Broderick and Bryte neighborhood streets (Lisbon Avenue, Carrie Street, Todhunter Avenue, Anna Street, Kegle Drive, Cummings Way, and Sixth Street)
2) West Sacramento neighborhood streets near Washington High School (Meadow Road west of Westacre Road)
3) 3) West Sacramento neighborhood streets near Memorial Park (Eighteenth Street, Regent Street, and Virginia Street south of Nineteenth Street)
4) Higgins Road and Constitution Avenue

A bike route will be located at Evergreen Avenue, east of Harbor Boulevard because an alternative for on-street parking of large trucks in this area is not available. The Evergreen Avenue bike route is scheduled as a priority B project because linkage to the path system depends on other priority B projects.\

Temporary Bike Routes

The purpose of some of the bike routes shown in Figure 18 for priority A implementation is to provide temporary linkage with other priority A projects,

before priority B and C projects are constructed. These projects include the following locations:

A 12-foot wide easement for construction of a 6-foot wide asphalt path, benches and lighting should be negotiated with property owners for implementation of the path. Installation of picnic tables adjacent to the path should also be negotiated with owners of undeveloped property as part of development plans. Retrofit of the path with existing development will also need to be negotiated with the property owners of parcels where existing development has occurred. Existing developments are located on four parcels immediately east of Enterprise Boulevard and the parcel at the east edge of Lake Washington where the Lake adjoins the Reclamation District easement. A culvert or retaining wall. for the Reclamation District drainageway is needed, at the parcel at the east edge of Lake Washington, in order to create room for the path in this location only.

FREEWAY, RAILROAD, AND BRIDGE CROSSINGS

Freeway, railroad, and bridge crossings are important components of the Master Plan because they serve as arterial connections between areas of the City that are separated from each other by major constraints formed by the freeways, railroads, and waterways (see Chapter II, Figure 3: Constraints).

Traffic control and warning signs should be placed at all freeway crossings where bikes are routed on sidewalks. Special emphasis should be placed on warning and traffic control signage to compensate for substandard conditions. -Signage should alert pedestrians as well as bicyclists to the mixed usage of the sidewalk. Curb cuts will also need to be constructed at these crossings where the bike route enters and exits the sidewalk, and railings retrofitted at overcrossings for a minimum "barrier" height of five feet.

Railroad crossings

At-grade crossings of railroads are proposed for bike lanes and bike paths. Grade separations are proposed for recreation trails at two locations where no existing street crossings occur and the existing height and steep slope of the railroad grade prohibits construction of trail crossings at-grade.

Three grade separations are proposed for recreation trails at the intersection of the Union-Pacific and Southern-Pacific railroad tracks,. A fourth grade separation is proposed at Sacramento Avenue and Eighth Street where a portion of the UnionPacific tracks adjoin Southern-Pacific tracks These grade separations are essential for linkage of the trails paralleling the railroads into a path system, and can be achieved with a tunnel under the elevated railroad grade, similar to an existing tunnel constructed for a bike path in the City of Davis.

Bridge Crossings

The Jefferson Boulevard bridge crossing of the Deep Water Ship Channel is designated for widening by the General Plan, and is shown to remain in the existing condition until widening occurs. The existing grating material should be modified now to meet the standards outlined in this document.

EQUESTRIAN TRAILS

Equestrian trails are not currently included in the Bicycle and Pedestrian Path .aster flan- Further study is needed to determine the level of public interest in equestrian trails and trail locations that are suitable for equestrian use. Trails that are located on levees are subject to jurisdiction of the Reclamation Board, which currently prohibits equestrian use from trails that are permitted on levees. An equestrian trail loop may possibly be developed south of the Barge Canal, along the lain Drainage Canal in combination with the Union Pacific Railroad right-of-way, since levees do not occur along the Main Drainage Canal. Equestrian usage may be combined with pedestrian usage, however, equestrian use should be separated from bicyclists.

VI. DESIGN GUIDELINES

The Bicycle and Pedestrian Path Master Plan is based upon the objectives and policies outlined in Chapter III, which were subject to review by the Parks and Recreation Commission, City Council, and citizens of West Sacramento. Implementation of Bike Routes, Bike Lanes, Bike Paths and Recreation Paths is guided by the Standards and Definitions outlined in Chapter IV. The Master Plan standards are based upon Caltrans standards for bikeways in which safety considerations and accessibility for all users are priorities. These standards form a complete set of design guidelines for implementation of the Master Plan, with the following additional information.

Safety and Emergency Provisions

Visibility is a primary factor contributing to the safety of bikeways and cannot be overemphasized. Adequate sight distances must be maintained at all traffic intersections where bicycles and motor vehicles merge. Signage should also be utilized to reinforce visibility by calling attention to the prescence of bicyclists and pedestrians. Lighting should be provided in low visibility and low traffic areas to improve safety, including undercrossings at railroad grades. Also, telephones should be provided at approximately half-mile intervals on Bike Paths and Recreation Paths where existing telephones are not available nearby. In areas where existing telephone lines do not occur, solar powered emergency call boxes should be a provided.

Staging Areas

Staging areas should be included as components of the Master Plan for providing vehicular access to recreational trails for bicyclists and hikers. These areas should occur at the Boat Ramp, the proposed expansion of Bryte Park, and three other community parks that are proposed by the Parks Master Plan. Two of the proposed parks are located adjacent to the River and south of the Barge Canal, and the other is located at the Deep Water Ship Channel and Morton Canal.

A trail spur should occur between the staging area and the Recreation Trail to which access is being provided. The trail spur should be designed to the same standards as the Recreation Trail, including the use of bollards to prevent motor vehicles from entering the spur and a curb cut where the spur adjoins the parking area.

A minimum of 12 parking spaces and 1 handicap space should be acccomodated in the parking area. Signage that identifies the parking area for trail access should be provided, as well as a trailhead sign with a map showing the City's Bicycle and Pedestrian Path Master Plan. Signage should maintain consistency with other park signs. Restrooms, a telephone, and a drinking fountain should be located nearby.

Exclusion of Motor Vehicles

The design standards for the Master Plan physically exclude unauthorized motor vehicles from Bike Paths and Recreation Paths by the placement of bollards where paths adjoin roadways and parking areas. Bollard placement may not physically exclude motorcyclists; therefore, signage indicating that no motor vehicles are allowed should be placed where paths adjoin roadways and parking areas. The City must also draft an ordinance banning motor vehicles from paths, establish a penalty for violating the ordinance, police the paths for violators, and issue citations.

VII. IMPLEMENTATION

Acquisition and Development

Implementation of the proposed Bicycle and Pedestrian Path Master Plan will create
approximately 25 miles of Bike Paths, 31 miles of Bike Lanes, 11 miles of Bike Routes, 40 miles of Recreation Trails, and a 1.5 mile Pedestrian Path. Estimated cost of implementation for the path system includes construction costs for all facilities and land acquistion costs for recreation trails in the railroad rights-of-way. Facilities include signage for bike routes, lanes and paths; striping and pavement markings for bike lanes and paths; and asphalt paving for bike

paths. All costs include a 25% contingency for design and engineering fees, are shown in 1991 dollars, and are based upon construction cost information collected from other municipalities in the central California area.

The following table indicates development projects by priority with estimated costs. Construction of several projects concurrently is recommended, since mobilization costs for individual projects could significantly increase costs. The estimated costs do not include mobilization costs for individual projects.

It is assumed that roadway improvements will be planned to accommodate bicyclists and pedestrians. Since projects are prioritized to coincide with roadway improvements, construction costs do not include costs associated with roadwork such as grading or placing fill material. Estimated costs also assume striping of bike lanes on existing streets in conjunction with street resurfacing. If the projects are not planned to coincide with street resurfacing, additional funding will be required for grinding existing striping from roadways prior to striping bike lanes.

FUNDING SOURCES

A variety of sources must be actively pursued for primary funding of the Bicycle and Pedestrian Path Master Plan, since a single source is not available to completely meet funding needs. Private developers can be required to implement portions of the path system as part of development projects, and allocations can be made from the City's General Fund.

The largest source of funds, however, is government grants, which are subject to legislative approval of bond measures. Information on currently available grants can be obtained from the California Department of Parks and Recreation Local Assistance Office in Sacramento.

The following is a list of funding sources available at this time.

City of West Sacramento General Fund

Some funds are currently available from the general fund for development of recreational facilities. The City could elect to provide a greater general fund commitment to the development of recreational facilities, including bicycle and pedestrian paths.

Landscape and Lighting Act of 1972: One city-wide landscape and lighting district currently exists in West Sacramento. The district is limited in scope to street median plantings; however, recreation trails and pedestrian paths could be included within the district's designated purpose of providing landscape lighting and park and recreational improvements. Improvements must be paid for annually on a "pay-as-you-go" basis.

Mello-Roos Act of 1982: The City is considering establishing one district in the northern half of West Sacramento and another in Southport. All proposed bicycle and pedestrian path facilities can be included since the district's purpose covers any capital improvements with a life of five years or more. Two-thirds vote within -the District is required to levy a tax and incur bonded indebtedness. Improvements must be associated with increased service requirements from growth in the District.

California Bikeways Act (Department of Transportation)

A maximum of $90,000 per project per year will be allocated from the $360,000 in funds available per year from the Bike Lane Account.

Rail Transportation Bond Act Initiative Statute (Proposition 116)

A maximum of $4 million per year for five years will be allocated by the California Transportation Commission through a competitive process beginning in 1991. Funds will be provided for bicycle improvement projects that improve safety and convenience for bicycle commuters, and matching funds will be required by local agencies.

Transportation Development Act (TDA) Article 3

A percentage of the state sales tax is provided as competitive block grants for implementation and development only, not acquisition, of local pedestrian and bicycle facilities. Examples of facilities acceptable for funding include bicycle lanes, bridges and Class I paths.

Federal Bikeway Funds (23 U.S.C. Section 217)

A maximum of $4.5 million per year is available for 100 percent funding of independent bicycle facilities. While no matching funds are required, Federal Bikeway Funds are redirected from Federal Highway Funds and application must be made for authority to redirect funds for bikeways from state highway work.

Corps of Engineers Flood Control Projects

The Corps is currently working on levee improvements along the Sacramento River, and opportunities exist for funding of recreational improvements in conjunction with these projects and others planned for the River, the Sacramento Bypass and the Yolo Bypass. Federal funds are available for 50 percent of the cost of recreational development. The local agency sponsoring the recreational development must provide the remaining 50 percent of construction costs as well as all operations and maintenance costs. Funds are not available for acquisition unless land is required to provide access, parking, potable water, sanitation or related development for public control and for health and safety. Recreational

facilities that may be funded include parking areas, restrooms, signs, trails, water, plantings, public access, river overlooks, and fishing access. Strong local public and legislative support is required.

Land and Water Use Conservation Fund (National Park Service)

Matching funds are made available to state governments which administer the funds to local agencies on a 50/50 shared basis. Funds are determined by federal legislature and are available for development of recreation in urban and other areas utilized by large numbers of people.

Rivers and Trails Conservation Assistance Program (National Park Service)

While no funds are available as part of the program, technical assistance is provided for trail development, free of charge by the Park Service. Assistance includes strategies for fund raising, procedures for public involvement, and guidelines for design implementation

OPERATION AND MAINTENANCE

Implementation of the Bicycle and Pedestrian Path Master Plan will increase the need for City Parks and Recreation maintenance personnel, equipment and materials. Successful implementation will guarantee successful facilities only if an adequate maintenance budget is established for operating the bicycle and pedestrian path system prior to completion of construction. Therefore, it is essential that no facilities be constructed until proper levels of maintenance are assured.

Current maintenance funding is allocated from the City's general fund and will need to be increased with the establishment of the path system. Other alternatives include creating a new assessment district specially for-path system maintenance, increasing the current assessment rates for the existing landscape and lighting assessment district, or a combination of these alternatives.

Projected operation and maintenance costs are based upon maintenance cost information gathered from other municipalities in the central California area. Bike path and recreation trail maintenance costs are estimated at $1600 per mile annually. Maintenance costs of bike lanes are estimated at 60 percent of the implementation cost to allow for yearly striping and pavement markings. Bike lane signage is assumed to be virtually maintenance-free and covered in the 40 percent reduction from implementation costs. Maintenance costs for bike routes are considered to be negligible and otherwise covered under routine street sweeping.

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City of West Sacramento

Bicycle and Pedestrian Path Master Plan

Addendum - 1995

Parks and Community Services Department

Funded by the Yolo-Solano Air Quality Management Board

The City of West Sacramento Bicycle and Pedestrian Path Master Plan was formally adopted by the West Sacramento City Council on May 4, 1994. This document had been conceived and designed during the years of 1990 and 1991 with additional input gathered until its final adoption in 1994.

Several additional requirements have been added by the California Bicycle Transportation Act since the time that the Bicycle and Pedestrian Path Master Plan was originally written. In order for the document to remain current and to meet requirements for additional funding, all bicycle plans must portray the following elements:

- Estimated number of existing and proposed bicycle commuters
- Land use and population density
- Existing and proposed bikeways
- Existing and proposed end-of-trip bicycle parking facilities
- Existing and proposed bicycle transport and parking facilities for transportation connections,
- Existing and proposed shower facilities
- Bicycle safety and education programs
- Citizen and Community participation
- Consistency with long-range transportation, air quality and energy plans
- Project descriptions and priority listing
- Past expenditures and future financial needs description

These items are explained or shown in the following narratives and attached maps or referenced to a specific area in the original Bicycle and Pedestrian Path Master Plan document.

Proposed additions to the Bicycle and Pedestrian Path Master Plan document are also discussed in this document.

Required Elements

- ## Estimated number of existing and proposed bicycle commuters

Based on field data collected, bicycle use appears to approximately equal .4% of the vehicle volume. Current total trips within the City are estimated to be 301,677 (information provided by the City's traffic model - Oct 1, 1993). Thus deriving an estimated 1206 total bicycle commuter trips City wide. The current population projection for year 2015 is 78,000, an increase of 260%. With a linear increase in trip generation and a 50% increase in bicycle use due to future transportation system management, the future bicycle commuter trip generation rate is estimated to be 4,703 trips per day City wide.

- ## Land use and population density (map and description)

A City of West Sacramento Zoning Map is included in this addendum as Attachment #1.

- ## Existing and proposed bikeways (map and description)

This information is already included in the Bicycle and Pedestrian Path Master Plan. Existing Facilities, page 3 discusses facilities currently within the community and proposed bikeways. Proposed bikeways are discussed throughout the document and maps are provided as appropriate to the area and or subject. However, in addition to the existing and proposed bikeways currently addressed in the Bicycle and Pedestrian Path Master Plan, a connector bike path and park from the Yolo causeway to West Capitol Avenue running behind currently existing businesses is proposed.

The proposed connector bike path and park will be located on the north corner of the intersection of West Capitol Ave and Enterprise Blvd. adjacent to the eastern entrance to the Yolo Causeway bike lane. The connector bike path will be constructed behind currently existing gas stations and truck stops, eliminating the need for bicyclists to cross in front of traffic. The lane will connect with West Capitol Ave. at a site which is deemed to be the safest area for bicyclist to cross.

The proposed West Capitol Park, will be constructed on 12 acres of City owned land and constructed so as provide a nature preserve area along with a bicycle staging area. The park will include picnic tables, bike racks, drinking fountains, signage and portable restroom facilities. The surface of the park will be decomposed granite and bicyclists will have easy access to all areas of the facility. This facility will be located approximately ¼ mile from a Cal Trans Park and Ride facility so intermodal transportation will be possible.

Please see Attachments # 2 through 13 for information regarding West Capitol Park and the proposed connector path.

- ## Existing and proposed end of trip bicycle parking facilities

There are currently no sites developed which can be used as a proposed end of trip bicycle parking facilities. Bicycle staging areas will be included however as part of the development of the components of the Master Plan as discussed on page 53. The connector bike path and West Capitol Park as proposed in this addendum and shown in Attachments #2 through 13 shall also provide bicycle parking facilities

- ## Existing and proposed bicycle transport and parking facilities for transportation connections (map and description)

There are currently no existing intermodal facilities. Future proposals include proposed bicycle parking at the Cal Trans Park and Ride lot to be included with the I-80/Enterprise Boulevard interchange reconstruction and the bicycle parking to be included with the future Yolo Transit bus terminal. Please see Attachment #14.

- ## Existing and proposed shower facilities (map and description)

There are no existing or proposed shower facilities at this time.

- ## Bicycle safety and education programs (description)

The City of West Sacramento is continually developing programs to promote bicycle safety. Within the Afterschool Adventure and K.I.D.S. programs, a week each session is devoted to bicycle safety. At the Club West Teen center, bicycle maintenance, bicycle skills and safety issues are covered within their Bike Club programs and extensively covered before each bicycle trip. Additionally, a variety of joint educational programs are offered by the Parks and Community Services Department and the Washington Unified School District.

In 1993, the Parks and Community Services Department provided a staff member to sit on the Yolo Bike Safe Coalition Board. This groups meets and provides information to the general public of Yolo County regarding bicycle safety. The Parks and Community Services Department along with Yolo Bike Safe, implemented a bicycle rodeo where participants were provided bike helmet, safety skill, and general bicycle maintenance information. Forty six bicycle helmets were donated to low income participants. Bicycle rodeos are planned to be held each year in various areas of the community to allow maximum participation.

Because of the increased education programs offered by the Parks and Community Services Department, Bicycle and Pedestrian injuries have decreased in the last year as the table below shows:

	Bicycle			Pedestrian		
Year	Injury	Fatal	Total	Injury	Fatal	Total
1991	13	0	19	7	1	10
1992	19	0	21	11	2	13
1993	11	0	14	3	1	4

• Citizen and community participation

The Bicycle and Pedestrian Path Master Plan has been approved by the Parks and Community Services Commission, the Youth Commission and the Commission on Aging. Additionally, it was adopted by the City of West Sacramento City Council in May 1994. This document is a intregral part of the Parks and Community Services Master Plan that was developed as a result of many public hearings and community input.

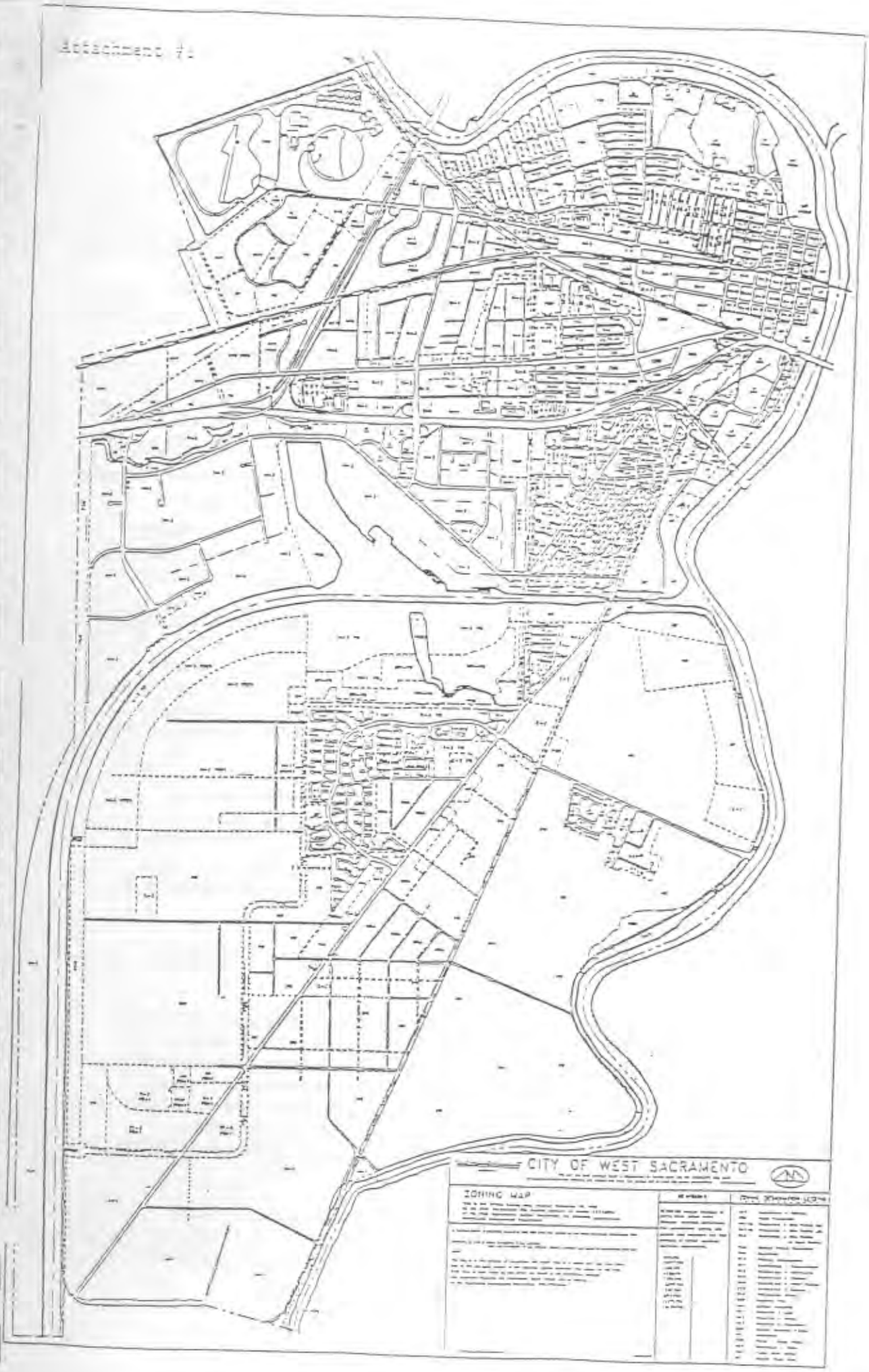
• Consistency with long-range transportation, air quality and energy plans.

The federal air quality non-attainment area planning boundaries include West Sacramento in a carbon monoxide and an ozone non-attainment area. (Sacramento Urbanized Area)

Bicycle and pedestrian paths will encourage bicycling and walking as alternatives to automobile transportation, thereby diminishing the impact on transportation on air quality, fuel reserves, and open space, currently experienced as a result of increasing numbers of automobiles. Carbon monoxide emissions from mobile sources (cars, trucks, buses etc.) can be as high as 90% of all emissions in urban areas. Under the 1990 Clean Air Act Amendments, ozone and carbon monoxide non-attainment areas must take pollution reduction actions to meet air quality standards. Measures to increase the use of non-polluting bicycling and walking transportation can be an effective way to achieve compliance.

Other environmental benefits of bicycling and walking resulting from the use of proposed bicycle and pedestrians paths will be the reduction of negative environmental impacts from drilling, refining, transporting, storing and disposing of petroleum products.

Attachment 4



Attachment #2

West Capitol Park

West Capitol Avenue is the largest and busiest road in West Sacramento. This is a vital transportation link between the City of Davis, Yolo County, downtown Sacramento and the State Capitol of California. It is also the only bicycle lane between Yolo County and Sacramento. The proposed project would develop a twelve (12) acre park as a rest area for cyclists, joggers, pedestrians on West Capitol Avenue at the intersection of Highway 80, the Yolo Bypass bike path and the West Capitol bike lane. The property is currently undeveloped and owned by the City of West Sacramento. West Capitol Park will provide a perfect and safe location to rest and relax for the cyclist, jogger and pedestrian before they begin the bicycle trek across the Yolo bypass or the last push to the State Capitol or Old Town Sacramento.

The addition of West Capitol Park to the City of West Sacramento and Yolo County will not have a negative impact on the existing West Capitol Avenue, but will enhance its beauty and increase the safety of the public using the bike lanes by providing a rest area away from the traffic on the busiest road in the community. Also, this facility will act as a rest stop for cyclists, joggers and pedestrians traveling in Yolo county from the north of West Sacramento south towards Clarksburg. This rest stop is a logical addition in a perfect location linking north south non automobile travel use as well.

A bicycle rest area of this nature does not currently exist between the City of Davis and the City of Sacramento. The construction of this new facility will be a welcome addition to the Yolo County Bicycle Plan and the City of West Sacramento Bicycle and Pedestrian Path Master Plan. This new facility will enhance the safety and usability of this already significant line in the non-vehicle traffic in Yolo County.

The West Capitol Improvement Plan prepared by the City of West Sacramento identifies the significance of the development of West Capitol Avenue and its positive impact on the economic vitality of the community and region. The construction of West Capitol Park increases the bicycle traffic into West Sacramento and Sacramento thereby increasing the positive impact of tourists on the community and the parallel improvement in the business climate of both communities, Sacramento and West Sacramento. The addition of the rest area also adds a very beautiful, serene and effective amenity to the recreation area of the City and Yolo County as a gateway to the Yolo Causeway.

The current recreational opportunities will be greatly enhanced by the addition of West Capitol Park. Thousands of people monthly use the existing bicycle pathway and the addition of this facility will significantly increase that number by providing a safe and effective rest area in West Sacramento at the precise moment when one is needed. The bicycle trek across the Yolo Bypass is strenuous for even the most avid cyclist and jogger and the placement of a rest area at this site is a perfect location for the public to catch their breath and continue with their journey.

This is the only facility of its kind in West Sacramento that will provide maximum availability to the pathway user.

West Capitol Park will beautify a portion of the west end of West Capitol Avenue, the main transpiration artery in West Sacramento. It will also provide an area suitable for educational programs related to the Yolo bypass and the vegetation and wildlife inhabiting the area. Prior to the trail user beginning the ride across the bypass, a monument sign will be constructed that provides information and education as to what the rail user will find as they cross the bypass. Heron, egrets, pheasants and rice field are examples of the information that will be provided. The facility will also have appropriate signage regarding location to the West Sacramento business and the State of California Capitol with mileage marker noting distance to a particular location.

Recycling litter containers will also be present on the site to assist the park user to keep the facility maintained. West Capitol Park also creates a logical meeting place for interpretive walks across the bypass where the inhabitants of the bypass can be pointed out and many educational and recreational

activities can take place such as bird watching on the bicycle trail through the bypass. West Capitol Park provides for many new recreation opportunities not yet explored thereby increasing the use of the trail by the community members.

The City of West Sacramento will construct and maintain the facility upon completion. The city is also willing and able to marshal volunteer groups thorough its teen center, Youth Diversion Program, Beautification Committee, Downtown Merchant's association and service clubs to maintain and assist in the construction of this facility.

The City of West Sacramento will also involve through education programs, youth bicycle clubs and nature programs on the site to enhance the appreciation of the wildlife who call the Yolo Causeway home.

The bike lanes on West Capitol Avenue have been funded thorough the Cal Trans Bike Lane Account. The City will complete construction of bike lanes on both side of West Capitol Avenue from I-80/Enterprise Interchange to Merkly Avenue.

The bike path is being designed with the improvements to the I-80/Enterprise Interchange and will connect the bike lane on I-80 causeway bridge and the bike lanes on West Capitol Avenue. The City has an ISTEA grant for design and construction of this bike path.

Attachment #4

Statement of Project Consistency

West Capitol Park is completely consistent with:

- The City of West Sacramento
- Park Master Plan
- Bicycle and Pedestrian Master Plan
- Sacramento Greenway Plan
- Yolo County Bikeway Plan
- West Capitol Avenue Improvement Plan

The permits needed include:

- Construction permit
- Environmental certification
- Encroachment permit
- Storm water pollution prevention permit

Approvals include the following:

- City of West Sacramento
- Youth Commission
- Parks and Community Services Commission
- Commission on Aging
- Planning Commission
- City Council approval (they have already approved Resolution 94-89 included in this application packet)

Proposed Budget (to be funded through grant funds)

1.	Construction engineering and design		30,000
2.	Construction to include:		
	A.	6 concrete picnic tables @$785.00 each	4,700
	B.	Recycling trash containers (3)	1,000
	C.	Interpretive signs	1,000
	D.	Site clearing/grading	35,000
	E.	Decomposed granite surface	10,000
	F.	Drinking fountain	2,000
	G.	Trees -15 gallon including stakes Sapium Sebiferum/Chinese Tallow Tree (100) @$40.00	4,000
	H.	Portable restroom shelter	1,000
	I.	Concrete garbage cans (4)	2,060
	J.	Asphalt pathway	5,000
	K.	Irrigation	3,500
	L.	Security fencing	3,000
	M.	Security lighting	10,000
	N.	Bicycle rack (1)	140
	O.	Wooden bollards (security)	1,000
3.	10% contingency		11,340
Total design construction funds requested			113,400

Attachment #6

Labor Two (2) City Park workers	$5,300.00/year
Fertilization	50.00/year
Volunteer labor (200 hours)	1,206.00/year
Monthly youth diversion (144 hours)	870.00/year
Service club maintenance (120 hours)	720.00/year

City maintenance will include:

Daily litter removal.

Replace litter bags.

Cleaning of decomposed granite.

Graffiti removal as needed.

Clean sign area.

Restake trees.

Prune trees.

Clean picnic tables.

Check irrigation/aerate as needed.

City replacement of vandalized amenities as needed

Estimate:	1,000.00/year
Youth, wildlife educational programs	5,000.00/year
Total	14,173.30

Planting details

This project calls for the planting of one hundred (100) 15 gallon Sapium sebiferum (Chinese tallow) trees. All trees will be planted on this site. All trees will be staked and planted per the specifications of the Environmental Enhancement and Mitigation Program Procedures and Criteria Document.

Attachment #8

Quarterly Cash Expenditure Plan

The City of West Sacramento will pay subcontractors and consultants as their work is completed.

For example, when the engineering and design work is completed they will be paid for their services rendered.

A general schedule is as follows:

1.	Quarter 1 Engineering and design	$30,000
2.	Quarter 2 No expenditures as contractor is being sought.	
3.	Quarter 3 Site clearing and construction	$75,060
4.	Quarter 4 Final payment	$8,340

Attachment #9

Project Completion Schedule

1. Notification West Sacramento will receive the funds in 1995.

2. Completion of design and construction documents - 60 days.

3. Construction bids sought - 30 days.

4. Construction firm approved and work begins in 60 days.

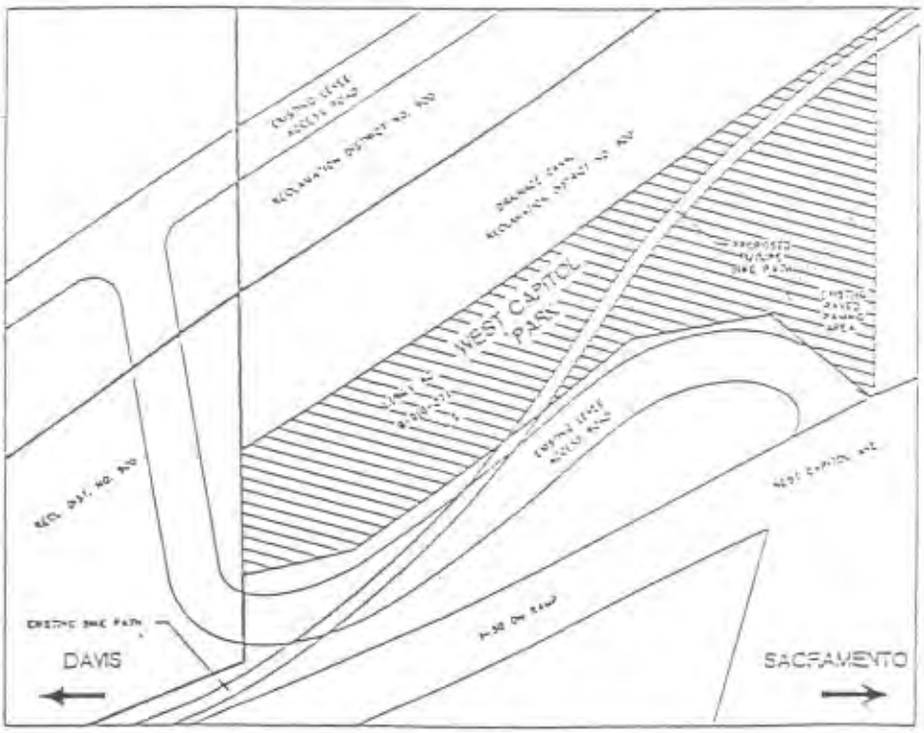
5. Construction completed in 90 days.

6. Final punch list items complete and City Council accepts work - 30 days.

Total project completion time: Nine (9) months from notification of funding.

VICINITY MAP

LOCATION MAP



SITE MAP

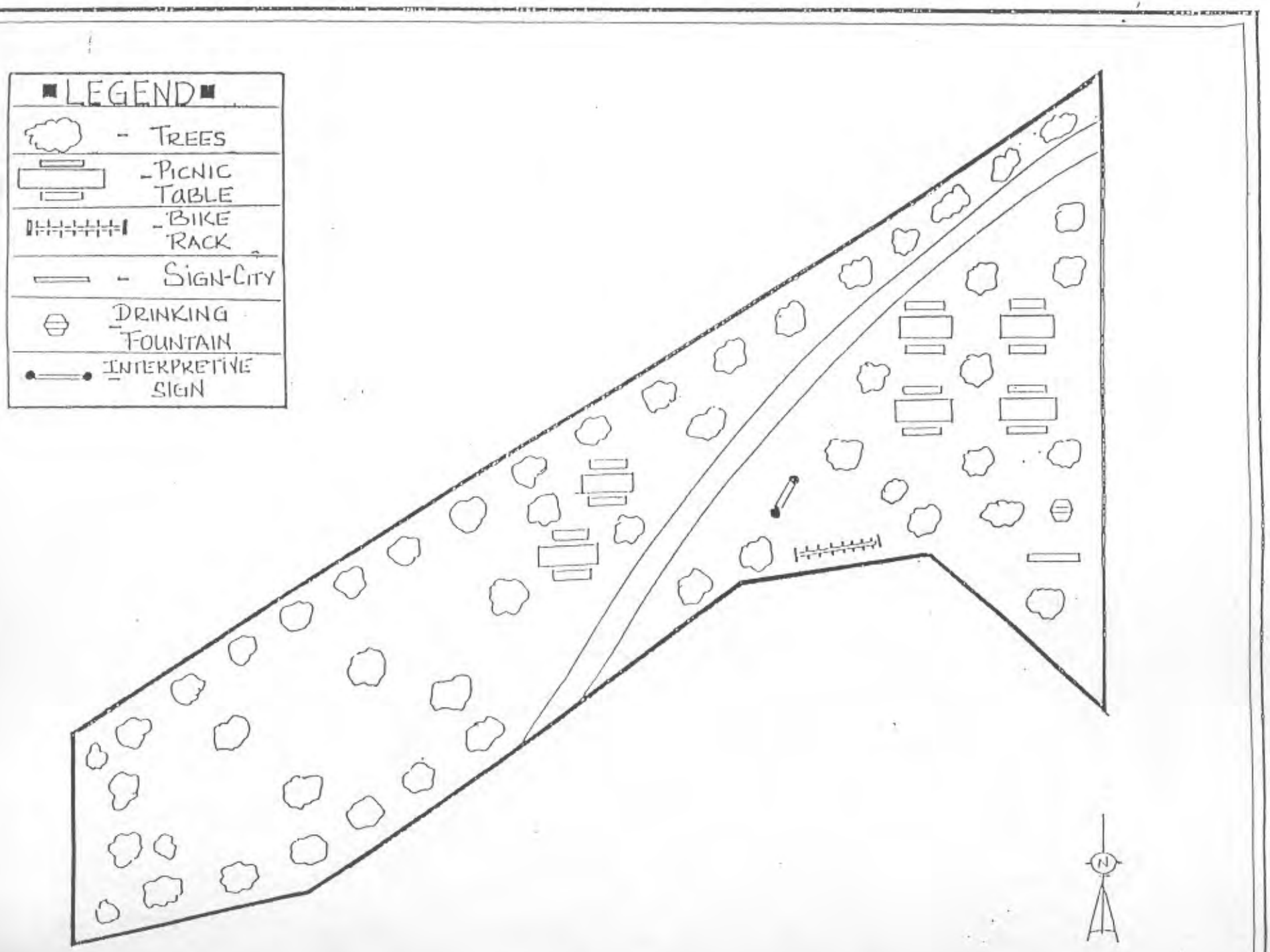
LOCATION MAP

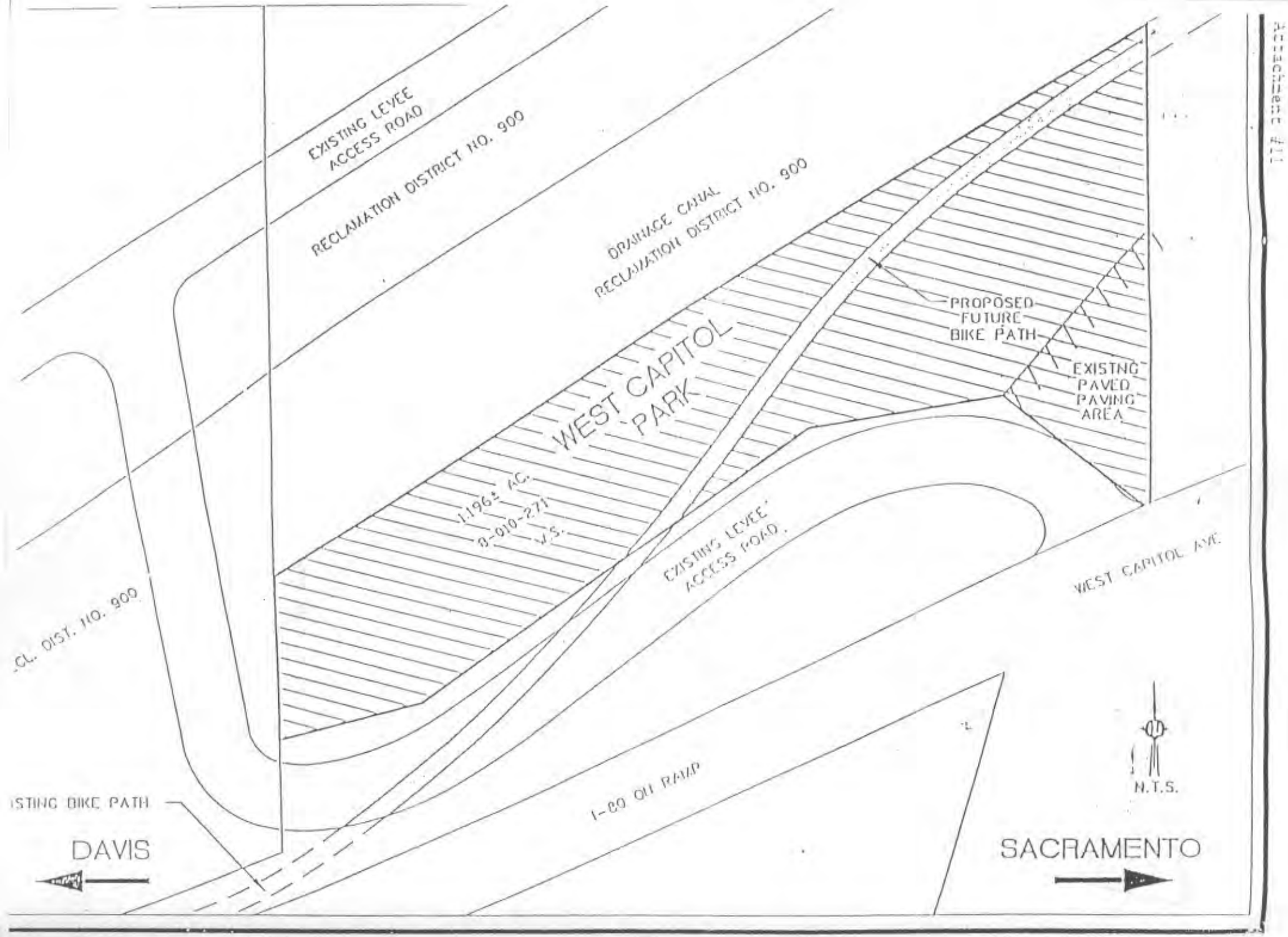
WEST CAPITOL PARK

BIKE PATH ROUTE

14
10
8
58
67
46
45
N

Attachment #13


LEGEND
- TREES
- PICNIC TABLE
- BIKE RACK
- SIGN-CITY
DRINKING FOUNTAIN
INTERPRETIVE SIGN
N



Attachment #11

Appendix B

Scoping Reports

Appendix B.1

Scoping Report—December 2011

Memorandum

Date:	December 14, 2011
To:	John Suazo U.S. Army Corps of Engineers, Sacramento District 1325 J Street Sacramento, CA 95814 John Powderly City of West Sacramento 1110 West Capitol Avenue West Sacramento, CA 95691
Cc:	Michael Bessette, City of West Sacramento; Dave Shpak, City of West Sacramento; Ric Reinhardt, MBK Engineers; Derek Larsen, MBK Engineers; Michael Vecchio, HDR; Lucy Eidam Crocker, Crocker & Crocker; Ken Ruzich, WSAFCA
From:	Jennifer Rogers, ICF Community Affairs Specialist
Subject:	**Southport EIP Scoping Meeting Summary**

Introduction

To comply with the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA), the U.S. Army Corps of Engineers (USACE) and West Sacramento Area Flood Control Agency (WSAFCA) are preparing a joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Southport Sacramento River Early Implementation Project (Southport EIP). The EIS/EIR will be used to analyze and disclose the potential effects the Southport EIP may have on the natural and human environment and to identify mitigation measures and alternatives to avoid significant effects. USACE is the lead agency under NEPA, and WSAFCA is the project proponent and lead agency under CEQA.

USACE and WSAFCA have been carrying out scoping activities to assist them in determining the scope, focus, and content of the EIS/EIR. USACE and WSAFCA conducted two scoping meetings for the public and interested parties on September 15, 2011. This document summarizes the scoping process and comments received.

Noticing

Notice of Preparation/Intent

In compliance with the requirements set forth in NEPA, USACE prepared a Notice of Intent (NOI) describing its intent to prepare an EIS, the proposed action, the possible alternatives, and relevant scoping meeting and contact information. The NOI was posted in the *Federal Register*, the United States Government's official noticing and reporting publication, on August 26, 2011. The official comment period for the NOI was August 26, 2011, to September 26, 2011.

In compliance with the requirements set forth in CEQA, WSAFCA prepared a Notice of Preparation (NOP). The NOP contained a brief description of the proposed project; probable environmental effects; the date, time and place of the public scoping meetings; and contact information. The NOP solicited participation in determining the scope of the EIS/EIR. On August 24, 2011, the NOP was sent to Responsible and Trustee Agencies and involved federal agencies, to the State Clearinghouse, and parties previously requesting notice in writing. The comment period on the NOP was August 24, 2011 to September 26, 2011.

Mailings

WSAFCA mailed approximately 3,500 scoping meeting invitations 2 weeks before the meeting. Of those, four invitations were to addresses outside the City of West Sacramento (City) limits. Approximately 485 invitations were returned by the postal service because of an erroneous address, vacant residence, or related cause. Invitations were sent to all properties within 500 feet of the project site, including borrow areas, and within 100 feet of a proposed haul route.

The City iLights online newsletter (www.cityilights.org), which is developed by the City, featured an article describing the Southport EIP and noted the times and date of the scoping meetings. A notice of the article's posting was emailed September 7 to nearly 700 West Sacramento residents that are in the City's database.

Fliers publicizing the scoping meetings also were handed out at a community meeting on August 18, 2011. This meeting was conducted by Crocker & Crocker, and invitees were certain landowners potentially affected by the setback alternative under consideration for the Southport EIP.

A media advisory, developed by Crocker & Crocker, was sent electronically to local media outlets to inform them of the two scoping meetings. Media outlets who received this advisory included the West Sacramento News-Ledger, West Sacramento Press and the Sacramento Bee. These publications are those which local residents and regional stakeholders read to stay informed of city and regional activities. The West Sacramento Press included the information in an article on September 7, 2011.

Website

ICF International developed language to publicize the meetings that was posted on the City's flood management Web page the week of August 22, 2011 at

http://www.cityofwestsacramento.org/city/flood/levee_improvements.asp. After the meetings, the materials presented at the meetings were posted to this Web page for public viewing and public record.

Legal Notices

Legal notices briefly introducing the lead agencies and the proposed Southport EIP and publicizing the scoping meetings were placed in the *West Sacramento News-Ledger*, *The West Sacramento Press*, and the *Sacramento Bee* newspapers on August 24, 2011. The *Sacramento Bee* was intended to reach a regional public audience, and the *West Sacramento News-Ledger* and *West Sacramento Press* were intended to reach local residents.

Appendix A contains copies of the following documents:

- Notice of Preparation (including resource agency mailing list)
- Notice of Intent
- Meeting invitation flier mailed in hard copy
- Article posted on City iLights newsletter website
- Email notice sent to City iLights subscribers
- West Sacramento News-Ledger, West Sacramento Press and Sacramento Bee public notices
- Media advisory
- Article posted in the West Sacramento Press

Public Meetings

Two public scoping meetings were held to inform the public of the proposed Southport EIP and provide an opportunity for input on the range of alternatives, environmental effects, and any issues of concern. The two meetings were held on September 15, 2011, at the West Sacramento Recreation Center in the Community Room—one from 3:30 to 5:30 p.m., and the other from 6:30 to 8:30 p.m. The meeting location was chosen because it is easily accessible for residents of the Southport community, where the proposed project would be located. The meeting times were chosen to accommodate schedules of public agency representatives and the general public, including residents and business owners.

A 25-minute presentation was given at each meeting as a brief introduction to the proposed project, project objectives, schedule, potential alternatives, and environmental compliance.

The meetings featured an open house–style component in which attendees could read and view the information about the Southport EIP and interact with project staff, including WSAFCA, USACE, the City, MBK and HDR Engineering staff, and ICF International environmental consulting staff.

Twenty-four graphic display boards were available to attendees. The boards described and illustrated the West Sacramento Levee Improvements Program history and the Southport EIP's purpose, need and objectives, study area, levee deficiencies and potential improvements, environmental considerations, the NEPA/CEQA process, and project timeline. Project staff were stationed at the display boards to provide additional detail or answer any questions.

A prepared fact sheet was available for attendees to take with them. The fact sheet provided an overview of the Southport EIP and its objectives, the study area, and the environmental compliance process.

Comment cards were offered so that meeting attendees could provide feedback on the proposed project. These cards could be filled out during the meeting and given to a project team member or filled out after the meeting and sent to either USACE or WSAFCA by September 26, 2011.

Appendix B contains copies of the following materials:

- Display boards
- PowerPoint presentation
- Fact sheet
- Comment card

A total of 81 people attended the two meetings. Forty-seven comments were received. The dominant subject of spoken comments, questions at the meetings, and written comments were concerns regarding acquisition of private property and removal of homes. There was particular focus on removal of homes to allow construction of a setback levee, based on a combination of perceptions that flood risk is not evident; WSAFCA is only pursuing setback levees because the State of California may pay a higher share of the project costs; and private homes should not be traded for the recreation and open space benefits of others. Questions related to the necessity of a setback levee and the compensation homeowners will receive if their property is acquired also were reflected in many of the comments received. Subtopics related to this included:

- Will homeowners receive market value for their homes, despite the fact that the market is very depressed?
- What type of compensation will be given for those residents who have to be temporarily relocated?
- How can the emotional connection residents have with their homes be compensated for?
- Business relocation could mean reduced revenues.

Below is a summary of other recurring themes in the written comments. Appendix C contains all written comments received during the scoping period.

- Consideration should be paid to archaeological resources in addition to water resources.
- All permits related to water quality should be obtained.

- WSAFCA should post all information about the proposed EIP on their website. This process should be very transparent.
- Opinion of recreational features proposed is generally favorable.
- There is general opposition to removing vegetation under USACE policy.
- Analysis should consider the impact the selected alternative would have on future development.
- Consideration of a slurry wall or relief well should be included.
- Traffic congestion during construction is a concern of residents.
- Apprehension was expressed about excess speed and traffic on S. River Road. This could be an opportunity to alter the road to have speed reduction features.
- Concern was evident related to construction disruptions: dust, noise, air quality, 24-hour work, staging and heavy equipment, and heavy traffic.

Next Steps and Recommendations

The comments received during the scoping period will assist in determining the issues to be evaluated in detail in the EIS/EIR. Alternatives developed based on the scoping process will be analyzed, and a draft EIS/EIR will be developed. Upon the release of the Draft EIS/EIR, the public will have 45 days to comment on the document. Additionally, at least one public meeting will be held so the public and agencies can learn more about the Draft EIS/EIR, ask questions regarding the analysis, and provide comments. At these meetings, the alternatives will be presented and explained.

Once the public comment period on the Draft EIS/EIR has concluded, USACE and WSAFCA will consider and respond to all comments and prepare a Final EIS/EIR. USACE and WSAFCA will consider all written comments in deciding which alternative(s) to select and implement. USACE and WSAFCA will document that selection in a record of decision (for NEPA), no sooner than 30 days following publication of the Final EIS/EIR, and in a notice of determination (for CEQA). Separate EIS and EIR documents may be prepared.

In response to expressed public concerns, future outreach efforts should:

- Educate landowners regarding flood risk and levee deficiencies.
- Inform landowners that all project alternatives require a footprint that goes beyond the existing levee—alternatives other than a setback levee also have features such as seepage berms or an adjacent levee that have the potential to result in loss of homes and need for property acquisition.
- Inform all landowners that all proposed alternatives and alternative selection will be based on rational, objective, data and science-driven processes defined by state and federal regulations, administered under the highest standards of professional practice and driven by WSAFCA and the City's obligations to ensure health and safety through flood risk reduction.

- Disclose the alternative screening criteria to demonstrate fairness and the full array of considerations in making a project decision.
- Inform landowners that while WSAFCA's state partner, the Department of Water Resources (DWR), may prefer the use of setback levees because of the measure's public safety and ecological benefits, the city will not implement setbacks in areas where it does not make sense to do so after considering all issues and impacts related to development, operation and maintenance.
- Highlight project benefits to the community-at-large and greater good of the city.

Appendix A
Public Notification

Appendix A contains copies of the following documents:

On Page

Notice of Preparation (including resource agency mailing list) 9
Notice of Intent 17
Meeting invitation flier mailed in hard copy 19
Article posted on City iLights newsletter website 20
Email notice sent to City iLights subscribers 23
West Sacramento News-Ledger, West Sacramento Press and Sacramento Bee public notices 24
September 15 Environmental Scoping Meeting for Southport Levee Improvement Project 27
West Sacramento Press article 28

Notice of Preparation

To: State Clearinghouse, Responsible Agencies, Trustee Agencies, Interested Parties
(Agency)
See Distribution List
(Address)

From: West Sacramento Area Flood Control Agency
(Agency)
1110 West Capitol Avenue
(Address)
West Sacramento, CA 95691

Subject: Notice of Preparation of an Environmental Impact Statement/Environmental Impact Report for the Southport Sacramento River Early Implementation Project

The West Sacramento Area Flood Control Agency (WSAFCA) is proposing the Southport Sacramento River Early Implementation Project (EIP) to implement flood risk–reduction measures along the Sacramento River South Levee in the city of West Sacramento, Yolo County, California. The project reach extends along the right (west) bank of the Sacramento River south of the Barge Canal downstream approximately 6.4 miles to the South Cross Levee, protecting the Southport community of West Sacramento. The 3.3–square mile study area encompasses the area of levee improvement along the river corridor and the potential soil borrow sites east and west of southern Jefferson Blvd. (Figure 1).

The project would bring the levee up to standard with Federal and state flood protection criteria, as well as providing opportunities for ecosystem restoration and public recreation. The U.S. Army Corps of Engineers (USACE), acting as the Federal lead agency under the National Environmental Policy Act (NEPA), and WSAFCA, acting as lead agency under the California Environmental Quality Act (CEQA), have determined that a project-level Environmental Impact Statement/Environmental Impact Report (EIS/EIR) should be prepared for the project.

Responsible and Trustee Agencies
Responsible and trustee agencies under CEQA may include City of West Sacramento, Yolo County, California Department of Fish and Game, California Department of Water Resources, Central Valley Flood Protection Board, California Regional Water Quality Control Board, State Lands Commission, and California Department of Parks and Recreation.

Public and Agency Input
USACE and WSAFCA are requesting your input on the scope and content of the Southport Sacramento River EIP EIS/EIR. All interested parties are invited to comment for a period of 30 days, beginning August 26, 2011. Please send comments by e mail or standard mail to a contact below by 5 p.m., Sept. 26, 2011.

Megan Smith, Project Manager
ICF International
630 K Street, Suite 400
Sacramento, CA 95814
Email: southportcomments@icfi.com

or

Mr. John Suazo
U.S. Army Corps of Engineers, Sacramento District
Attn: Planning Division (CESPK-PD-R) 1325 J Street
Sacramento, CA 95814
john.suazo@usace.army.mil

If commenting on behalf of a public agency or non-governmental organization, please include the name of a contact person.

Two public scoping meetings will be held at which the public can meet with lead agency representatives and provide written comments, on September 15, 2011, at 3:30 p.m. *and* 6:30 p.m., at the West Sacramento Recreation Center, Community Room, 2801 Jefferson Blvd., West Sacramento, CA 95691.

The attachment includes supplemental information for the proposed Southport Sacramento River EIP.

Date: Aug. 26, 2011

Signature: John F. Ford

Title: Associate Planner, City of West Sacramento

Telephone: (916) 617-4645

Reference: California Code of Regulations, Title 14, (State CEQA Guidelines) Sections 15082(a), 15103, 15375.

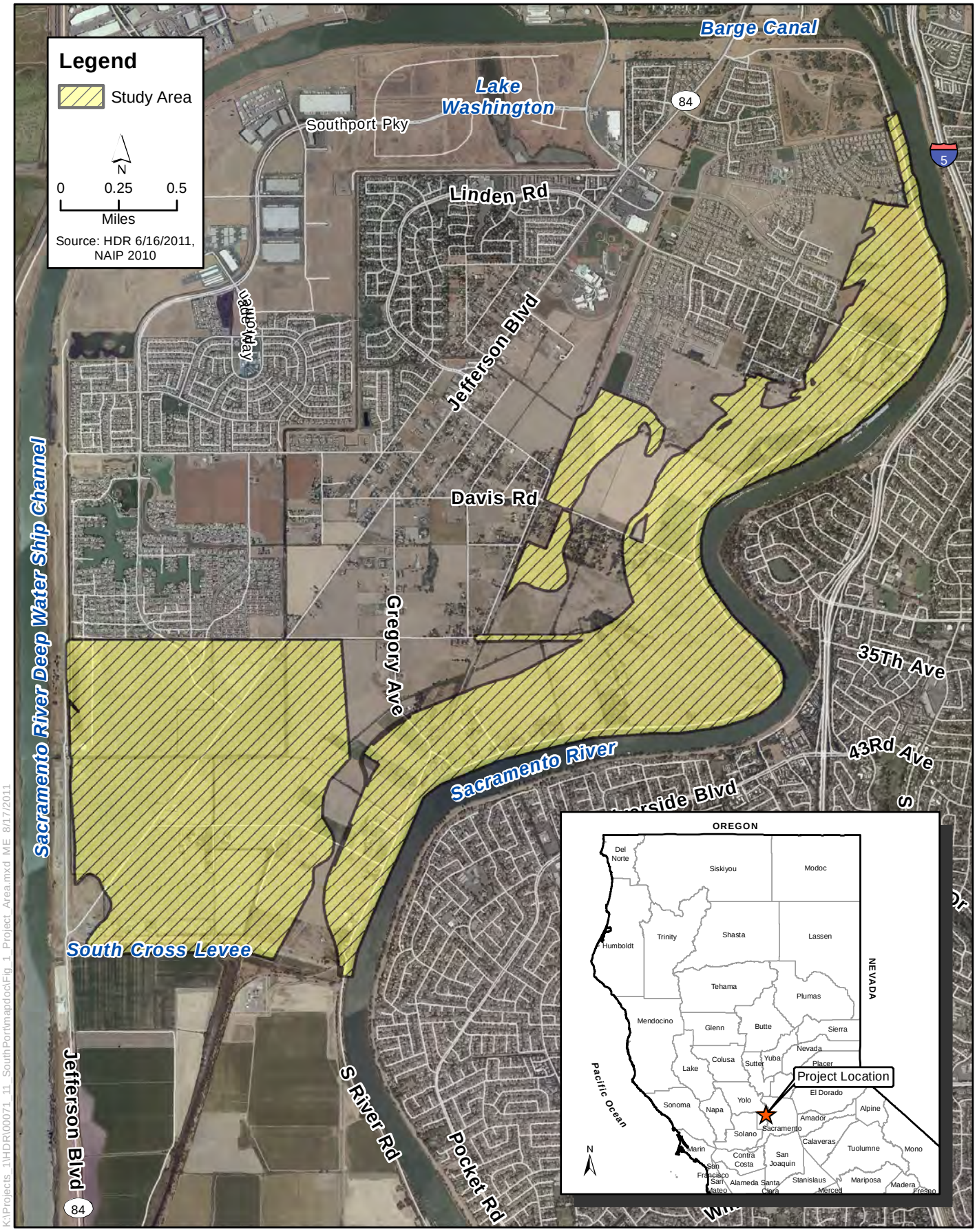


Figure 1
Southport Sacramento River EIP Study Area

Attachment to Notice of Preparation
Environmental Impact Statement/Environmental Impact Report
Supplemental Information

Location of Project Study Area:
As introduced in the Notice of Preparation, the West Sacramento Area Flood Control Agency (WSAFCA) is proposing the Southport Sacramento River Early Implementation Project (EIP) to implement flood risk–reduction measures along the Sacramento River South Levee in the city of West Sacramento, Yolo County, California. The project reach extends along the right bank of the Sacramento River south of the Barge Canal downstream approximately 6.4 miles to the South Cross Levee, protecting the Southport community of West Sacramento. The 3.3–square mile study area encompasses the area of levee improvement along the river corridor and the potential soil borrow sites east and west of southern Jefferson Blvd. (Figure 1).

Project Purpose and Lead Agencies:
The project would bring the levee up to standard with Federal and state flood protection criteria, as well as provide opportunities for ecosystem restoration and public recreation. The U.S. Army Corps of Engineers (USACE) will act as the Federal lead agency under the National Environmental Policy Act (NEPA). WSAFCA will act as lead agency under the California Environmental Quality Act (CEQA). As such, WSAFCA has principal responsibility for carrying out and approving the project. The agencies have determined that a project-level Environmental Impact Statement/Environmental Impact Report (EIS/EIR) should be prepared for the project.

USACE has three potential actions associated with WSAFCA's proposed project:

- under 33 United States Code, Section 408 (Section 408), the Chief of Engineers may grant permission to alter an existing flood control structure if it is not injurious to the public interest and does not impair the usefulness of such work;
- under Section 404 of the Clean Water Act, the District Engineer may permit the discharge of dredged or fill material into waters of the United States if the discharge meets the requirements for the Environmental Protection Agency's 404 (b)(l) guidelines and is not contrary to the public interest; and
- under Section 10 of the Rivers and Harbors Act, the District Engineer may permit activities that do not affect navigable waters.

WSAFCA is requesting such permissions in order to implement the project. The project must comply with NEPA to acquire these permissions. This project would continue work undertaken by WSAFCA for the I Street Bridge EIP (constructed in 2008), The Rivers and CHP Academy EIPs (under construction at the time of this NOP), and a separate effort led by USACE and the Central Valley Flood Protection Board at the Barge Canal in West Sacramento under the Sacramento River Bank Protection Project.

Project Description:
The EIS/EIR will analyze the possible environmental effects of combining a variety of flood protection measures to address known levee deficiencies. The flood protection measures considered in the EIS/EIR may include:

- slope flattening of the existing levee,
- use of seepage berms and/or stability berms located to the land side of the levee,
- rock slope protection located to the water side of the levee,
- setback levees and/or adjacent levees located landward of the existing levee,
- relief wells, and
- slurry cut-off walls.

The EIS/EIR will consider the environmental impacts of other foreseeable project elements and mitigation measures located in the study area. Foreseeable construction and maintenance of such flood protection measures likely would include, but not be limited to:

- use of neighboring roadways for project ingress and egress;
- creation of temporary access roads;
- construction of new roadways, including elevated spans;
- resurfacing and/or relocation of existing roadways;
- extraction of soil from identified borrow sites;
- disposal of excess soil at identified disposal sites; and
- relocation of public utilities.

The project will also be defined to include ecosystem restoration, such as levee breaches for habitat creation, planting and revegetation, and similar features. Recreation features will also be analyzed, such as trails, water access, staging areas; wayfinding and interpretive signs; and associated amenities.

Environmental Factors Potentially Affected:
The environmental factors checked below would potentially be affected by the proposed project (i.e., the project would involve at least one impact that is a "Potentially Significant Impact").

X Aesthetics	X Agriculture Resources	X Air Quality
X Biological Resources	X Cultural Resources	X Geology/Soils
X Hazards and Hazardous Materials	X Hydrology/Water Quality	X Land Use/Planning
X Mandatory Findings of Significance	X Mineral Resources	X Noise
X Population/Housing	X Public Services	X Recreation
X Socioeconomics and Environmental justice	X Transportation/Traffic	X Utilities/Service Systems

Attachment to Notice of Preparation
Environmental Impact Statement/Environmental Impact Report
Distribution List

Government Agencies

Bureau of Indian Affairs
Pacific Regional Office
Environmental Compliance Department
2800 Cottage Way
Sacramento, CA 95825

Bureau of Reclamation
Mid-Pacific Region
2800 Cottage Way
Sacramento CA 95825

California Department of Fish and Game
Jeff Drogensen
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670

California Department of Conservation
Rebecca Salazar
801 K Street, MS-24-02
Sacramento, CA 95814

California Department of Fish and Game
Glenda Marsh, Senior Environmental Scientist
1416 9th Street, Floor 12
Sacramento, CA 95814

California Department of Parks and Recreation
Bob Baxter
PO Box 942896
Sacramento, CA 94296-0001

California Department of Transportation, District 3
Kendall Schinke
2983 Gateway Oaks Blvd., Suite 100
Sacramento, CA 95833

California Department of Water Resources
Division of Water Resources
PO Box 942836
Sacramento, CA 94236
Central Valley Flood Protection Board
Eric Butler
3310 El Camino Ave. ll60
Sacramento, CA 95821

Central Valley Regional Water Quality Control Board
CEQA Compliance Division
11020 Sun Center Dr, #200
Rancho Cordova, CA 95670

Central Valley Regional Water Quality Control Board
Greg Vaughn
11020 Sun Center Dr, #200
Rancho Cordova, CA 95670

City of Sacramento
Planning Director
915 I Street, New City Hall, 3rd Floor
Sacramento, CA 95814

Colusa County
Director
220 12th Street
Colusa, CA 95932

Delta Protection Commission
Alex Westhoff
PO Box 530
Walnut Grove, CA 95690

Department of Boating and Waterways
David Johnson
2000 Evergreen Street, Suite 100
Sacramento, CA 95815-3888

Department of General Services, Real Estate Division
Shirley Bramham
707 3rd Street, Suite 505
West Sacramento, CA 95605

Federal Highway Administration
NEPA/CEQA Compliance Dept.
1200 New Jersey Ave., SE
Washington, DC 20590

FEMA Region IX, Federal Emergency Management
Donna Meyer, Deputy Regional Environmental Officer
111 Broadway, Ste. 1200
Oakland, CA 94607

National Marine Fisheries Service
Mike Hendrick
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

Native American Heritage Commission
Debbie Pilus Treadway
915 Capitol Mall, Room 364
Sacramento, CA 95814

Office of Historic Preservation
Milford Wayne Donaldson
1416 9th Street, Room 1442-7
Sacramento, CA 95814

Pacific Gas and Electric Company
Lou Norton
343 Sacramento Street
Auburn, CA 95603

Sacramento Air Quality Management District
Karen Huss
1947 Galileo Ct., Ste. 103
Davis, CA 95616

Sacramento Area Flood Control Agency
Tim Washburn
1007 7th Street, 7th Floor
Sacramento, CA 95814

Sacramento County Planning and Community Development Agency
Director
827 7th Street, Room 230
Sacramento, CA 95814

Sacramento National Wildlife Refuge Complex
Environmental Compliance Dept.
752 County Road 99W
Willows, CA 95988

Sacramento Regional County Sanitation District
Sharon Seargent
10545 Armstrong Ave.
Mather, CA 95655

Sierra Northern Railway
President
341 Industrial Way
Woodland, CA 95776

Solano County
Director of Public Works and Planning
601 Texas Street
Fairfield, Ca 94533

State Clearinghouse, Office of Planning & Research
1400 10th Street, Rm 121
Sacramento, CA 95814

State Lands Commission,
Environmental Management Division
Cy Oggins, Division Chief
100 Howe Ave, Suite 100 South
Sacramento, CA 95825

Sutter County Public Works Department
Director of Public Works
1130 Civic Center Blvd.
Yuba City, CA 95993

U.S. Army Corps of Engineers, Sacramento District
John Suazo, Attn: Planning Division (CESPK-PD-R)
1325 J Street
Sacramento, CA 95814

U.S. Department of the Interior, Office of Environmental Policy and Compliance
Patricia Sanderson Port, Regional Environmental Officer
1111 Jackson Street, Suite 520
Oakland, CA 94607

U.S. Environmental Protection Agency
Connell Dunning
75 Hawthorne Street
San Francisco, CA 94105

U.S. Fish and Wildlife Service
2800 Cottage Way, Room W-2605
Sacramento, CA 95825

USDA Natural Resources Conservation Service
221 W. Court Street
Woodland, CA 95695

Washington Unified School District
Scott Lantsberger, Assistant Superintendent
930 Westacre Road
Sacramento, CA 95691

Yolo County Agricultural Commission
70 Cottonwood Street
Woodland, CA 95695

Yolo County Environmental Health
Bruce Sarazin, Chief
137 N. Cottonwood St., Ste. 2400
Woodland, CA 95695

Yolo County Planning Department
Planning Director
292 West Beamer Street
Woodland, CA 95695

Yolo County Transit Authority
350 Industrial Way
Woodland, CA 95776

Yolo Habitat JPA
Maria Wong, Executive Director
120 West Main Street, Suite C
Woodland, CA 95695

Yolo Solano Air Quality Management District
Matt Jones
1947 Galileo Court, Suite 103
Davis, CA 95616

Non-Governmental Organizations

American Rivers
John Cain, Director, California Flood Management
244 Lake Drive
Kensington, CA 94708

California Farm Bureau Federation
Environmental Compliance Department
2300 River Plaza Drive
Sacramento, CA 95833

Center for Biological Diversity
351 California Street, Suite 600
San Francisco, CA 94104

Defenders of Wildlife
Kim Delfino, California Program Director
1303 J Street, Suite 270
Sacramento, CA 95814

Family Water Alliance
P.O. Box 365
Maxwell, CA 95955

Friends of the River
Ronald Stork, Senior Policy Advocate
1418 20th Street, Suite 100
Sacramento, CA 95811

Friends of the Swainson's Hawk
Judith Lamare, President
915 L Street, Suite C-425
Sacramento, CA 95814

Habitat 2020 Sacramento County
Attn: Chairperson
909 12th Street, Suite 100
Sacramento CA 95814

Sacramento Area Bicycle Advocates
Jordan Lang
909 12th Street, Suite 116
Sacramento, CA 95814

Sacramento River Preservation Trust
PO Box 5366
Chico, CA 95927

Sacramento Valley Landowners Association
PO Box 3014
Sacramento, CA 95812

Sierra Club
Terry Davis
801 K Street, Suite 2700
Sacramento, CA 95814

Sierra Club Motherlode Chapter
Tony Loftin, Chair, Sacramento Group
801 K Street, Suite 2700
Sacramento, CA 95814

Sierra Club-Yolano Group
Pamela Nieberg and Carolyn Hinshaw, Chairperson
3010 Loyola Drive
Davis, CA 95618

The California Central Valley Flood Control Association
910 K Street, Suite 310
Sacramento, CA 95814

The Nature Conservancy
2015 J Street, Suite 103
Sacramento, CA 95814

The Northern California Water Association
455 Capitol Mall # 335
Sacramento, CA 95814-4496

Tuleyome
Andrew Fulks
607 North Street
Woodland, CA 95695

Yolo Audubon Society
Chad Roberts, Conservation Chairman
P.O. Box 886
Davis, CA 95617

Individuals

Jeralyn and William Wingfield
[redacted]

Linda Pacheco
[redacted]

David Sanders
[redacted]

Act (NEPA) coverage for the proposed action.

The ROD discusses each alternative considered for the proposed action and those that are environmentally preferable. The Corps has identified an Adaptive Management Implementation Process (AMIP), with a construction ceiling of Alternative 3.5 (approximately 4,370 acres), as the selected plan. The key aspect of the AMIP is that, rather than selecting a specific acreage alternative, actions would be progressively implemented and monitored until the desired biological response of terns and plovers is attained and sustained. The Corps recognizes that alternative methods such as vegetation removal, while relatively untested, provide the potential to decrease impacts and costs, and could be incorporated if proven successful.

The FPEIS describes the potential environmental consequences of the alternatives considered in detail. During analysis, impacts of the larger alternatives (3, 2 and 1) were deemed to be moderate to high and impacts of lesser alternatives (3.5, 4 and 5) were deemed to be moderate to low. Alternative 3.5 represents a midrange of habitat available at a time when the birds were productive, and it is anticipated that biological metrics will be met before fully implementing up to Alternative 3.5. If Alternative 3.5 is fully implemented and biological metrics are not met, the Corps can consider continuing to higher acreage alternatives or other methodologies, in which case appropriate coordination and disclosure would be pursued (potential amended ROD or additional NEPA).

The AMIP allows for flexibility to provide habitat up to a point of meeting population goals, and to minimize impacts through approaches such as monitoring, redistributing acreage targets among segments if needed, avoiding sensitive resources, using less-impactful or costly construction methodologies as they become available, and avoiding over-construction of habitat.

Implementing the selected alternative will provide the most effective means for the Corps to meet its obligations, including avoiding jeopardy to the bird species, while managing the river for all authorized purposes. Risk of significant impacts to the environment appears to be low to moderate as a result of implementation of the ESH program, and numerous acres of ESH would be created, which is considered important not only to protected bird species, but to the overall ecology of the Missouri River.

Concurrently with the ROD, an errata sheet is also being made available, which provides the comments received on the Final PEIS along with the Corps response to each. Also included in the errata is an update regarding Tribal coordination and the PEIS.

2. Document Availability. The Final PEIS (May 2011), the ROD, the errata sheet, and an updated Final PEIS which incorporates the ROD and the errata items (August 2011), are available at: *http://www.moriverrecovery.org/mrrp/f?p=MRRP:documents*.

For more information about the Emergent Sandbar Habitat program, please visit *http://www.moriverrecovery.org* under ''BiOp/Mit Efforts.''

Dated: August 15, 2011.

Christopher D. Wiehl,

Acting Chief, Planning Branch, Omaha District.

[FR Doc. 2011–21894 Filed 8–25–11; 8:45 am]

BILLING CODE 3720–58–P

DEPARTMENT OF DEFENSE

Department of the Army; Corps of Engineers

Notice of Intent To Prepare an Environmental Impact Statement/Environmental Impact Report for the Section 408 Permission for the Southport Sacramento River Early Implementation Project, West Sacramento, CA

AGENCY: Department of the Army, U.S. Army Corps of Engineers; DoD.

ACTION: Notice of intent.

SUMMARY: Pursuant to the National Environmental Policy Act of 1969, as amended, and the California Environmental Quality Act (CEQA), the U.S. Army Corps of Engineers (USACE) intends to prepare an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) under Section 14 of the Rivers and Harbors Act of 1899 (as amended) (33 U.S.C. 408), and Section 404 of the Clean Water Act (33 U.S.C. 1344), for the proposed Southport Sacramento River Early Implementation Project (EIP), sponsored by the West Sacramento Area Flood Control Agency (WSAFCA). Figures of the project area can be viewed at *http://www.cityofwestsacramento.org/city/flood.*

WSAFCA is planning the Southport Sacramento River EIP to implement flood-risk reduction measures along the Sacramento River South Levee in the City of West Sacramento, Yolo County, CA. The project reach extends along the right bank of the Sacramento River south of the barge canal, downstream approximately 6.4 miles to the South Cross Levee, protecting the Southport community of West Sacramento. The 3.3-square mile study area encompasses the area of levee improvement along the river corridor and the potential soil borrow sites. In order to implement the project, the sponsor must acquire permission from USACE to alter the Federal project under Section 14 of the Rivers and Harbors Act of 1899 (as amended) (33 U.S.C. 408 or, Section 408). USACE also has authority under Section 404 of the Clean Water Act (33 U.S.C. 1344) over activities involving the discharge of dredged or fill material to waters of the United States, which are known to be in the project area. The project would bring the levee up to standard with Federal and state flood protection criteria, as well as providing opportunities for ecosystem restoration and public recreation. USACE, acting as the federal lead agency under NEPA, and WSAFCA, acting as the state lead agency under the CEQA in coordination with the Central Valley Flood Protection Board, have determined that an EIS/EIR should be prepared to describe alternatives, potential environmental effects, and mitigation measures.

DATES: Public scoping meetings will be held on Thursday, September 15, 2011 at 3:30 p.m. and 6:30 p.m. at the West Sacramento Recreation Center, 2801 Jefferson Boulevard, West Sacramento, CA. Send written comments by September 26, 2011 (see **ADDRESSES**).

ADDRESSES: Written comments and suggestions concerning the scope and content of the environmental information may be submitted to Mr. John Suazo, U.S. Army Corps of Engineers, Sacramento District, Attn: Planning Division (CESPK–PD–R), 1325 J Street, Sacramento, CA 95814. Requests to be placed on the mailing list also should be sent to this address.

FOR FURTHER INFORMATION CONTACT: Questions about the proposed actions and environmental review process should be addressed to John Suazo at (916) 557–6719, e-mail: *john.suazo@usace.army.mil* (see **ADDRESSES**).

SUPPLEMENTARY INFORMATION:

1. Proposed Action. WSAFCA is proposing a project along the Sacramento River west levee under the California DWR's Early Implementation Program to expeditiously complete flood-risk reduction measures. Known as the Southport Sacramento River EIP, the project proposes implementation of flood-risk reduction measures

(measures) along a 6.4-mile long reach between the barge canal downstream to the South Cross Levee. Primary deficiencies of the levee include through-seepage, under-seepage, and embankment instability (e.g., overly steepened slopes). As part of the project, an EIS/EIR is being prepared. USACE has authority under Section 14 of the Rivers and Harbors Act of 1899 (as amended) (33 U.S.C. 408), over alterations to federal flood control project levees and any such alterations as proposed by WSAFCA are subject to approval by USACE. USACE also has authority under Section 404 of the Clean Water Act (33 U.S.C. 1344) over activities involving the discharge of dredged or fill material to waters of the United States, which are known to be in the project area. Under Section 10 of the Rives and Harbors Act, the District Engineer may permit activities which do not affect navigable waters. Due to these authorities, USACE is acting as the lead agency for the EIS pursuant to NEPA. WSAFCA will be acting as the lead agency for the EIR according to CEQA as the public agency that has the principal responsibility for carrying out and approving the project.

2. Alternatives. The EIS/EIR will consider several alternatives for reducing flood damage. Each alternative analyzed during the investigation will consist of a combination of several measures to reduce the risk of flooding. These measures include, but are not limited to, installing slurry cutoff walls, constructing seepage or stability berms, relief wells, rock slope protection, slope flattening, and potential new levee alignments (setback or adjacent levees).

3. Scoping Process.

a. Public scoping meetings will be held on September 15, 2011, to present information to the public and to receive comments from the public on the project. These meetings are intended to initiate the process to involve concerned individuals, and local, State, and Federal agencies.

b. Significant issues to be analyzed in depth in the environmental documents include effects on hydraulics, wetlands and other waters of the U.S., vegetation and wildlife resources, special-status species, aesthetics, cultural resources, recreation, land use, fisheries, agricultural resources, water quality, air quality, transportation, and socioeconomics; and cumulative effects of related projects in the study area.

c. USACE is consulting with the State Historic Preservation Officer to comply with the National Historic Preservation Act and with the U.S. Fish and Wildlife Service and National Marine Fisheries Service to comply with the Endangered Species Act. USACE also is coordinating with the U.S. Fish and Wildlife Service to comply with the Fish and Wildlife Coordination Act.

d. A 45-day public review period will be provided for individuals and agencies to review and comment on the draft environmental document. All interested parties are encouraged to respond to this notice and provide a current address if they wish to be notified of the draft EIS/EIR circulation.

4. Availability. The draft EIS/EIR for the Southport Sacramento River EIP is scheduled to be available for public review and comment in mid-2012.

Dated: August 17, 2011.

William J. Leady,

COL, EN, Commanding.

[FR Doc. 2011–21878 Filed 8–25–11; 8:45 am]

BILLING CODE 3720–58–P

DEPARTMENT OF DEFENSE

Department of the Army; Corps of Engineers

Intent To Prepare a Draft Supplemental Environmental Impact Statement for the Larose to Golden Meadow Hurricane Protection Project, Post-Authorization Change Study, in Lafourche Parish, LA

AGENCY: Department of the Army, U.S. Army Corps of Engineers, DoD.

ACTION: Notice of intent.

SUMMARY: The U.S. Army Corps of Engineers (USACE) intends to prepare a supplemental environmental impact statement (SEIS) for the Larose to Golden Meadow Hurricane Protection Project, Post-Authorization Change (PAC) Study. This project was originally authorized in 1965. Construction began in 1972 and is still underway. The PAC Study was initiated to identify and evaluate modifications needed to ensure that completion of project features, designed and constructed before development of the post-Katrina Hurricane and Storm Damage Risk Reduction System (HSDRRS) Design Guidelines, are in compliance with these new guidelines.

The subject SEIS will supplement the original environmental impact statement (EIS) prepared for the project as authorized in 1965. The Statement of Findings for the original EIS was signed on April 4, 1975. An SEIS was subsequently prepared to address proposed modifications to the authorized plan. The Record of Decision for this first SEIS was signed on May 20, 1985.

FOR FURTHER INFORMATION CONTACT: Questions concerning the draft SEIS should be addressed to Charlene Carmack, Rock Island District, Corps of Engineers, CEMVP–PD–C, Clock Tower Building, P.O. Box 2004, Rock Island, IL 61204–2004; telephone (309) 794–5570; fax (309) 794–5157; or be e-mail: *Charlene.Carmack@usace.army.mil.*

SUPPLEMENTARY INFORMATION:

1. *Authority.* This SEIS will be the second supplement to the EIS originally prepared for the Larose to Golden Meadow Hurricane Protection Project. This project was authorized by the Flood Control Act of 27 October 1965, House Document No. 184, 89th Congress (Pub. L. 89–298), which authorized the project ''hurricane-flood protection at Grand Isle and Vicinity, Louisiana'' to provide protection in accordance with the recommendation of the Chief of Engineers in his report entitled ''Grand Isle and Vicinity, La.'', and contained in House Document No. 184, Eighty-ninth Congress, 1st Session. The authorized project is a ring levee system with associated control structures that provides hurricane and storm damage risk reduction to communities located along both sides of Bayou Lafourche in Lafourche Parish, Louisiana. The overall levee system is approximately 43 miles long, extending from Larose to a point 2 miles south of Golden Meadow, Louisiana. Roughly 25,000 people live in the communities of Larose, Galliano, Cutoff, and Golden Meadow, which are located within the ring levee system.

2. *Alternatives.* Alternatives currently being evaluated in the PAC Study include: (1) Stabilize the existing levee using current criteria for still-water elevations, which would complete the project without exceeding the 1965 authorized elevation listed in the Grand Isle, Louisiana, and Vicinity General Design Memorandum (with datum adjustments), and meet the current approved design guidelines excluding the Post-Hurricane Katrina hydrology and hydraulics design guidelines; (2) modify the 1965 design to complete the project providing a level of risk reduction based on the 1965 storm surge design elevations (with datum adjustments) using the current HSDRRS Design Guidelines to include the Post-Hurricane Katrina surge models; (3) complete the existing levee system in general conformance with the previously authorized design. These alternatives will be further formulated and developed during the scoping process and an appropriate range of alternatives will be considered in the new SEIS. These may include

Learn More about the Latest Levee Improvement Project in the Southport Area!

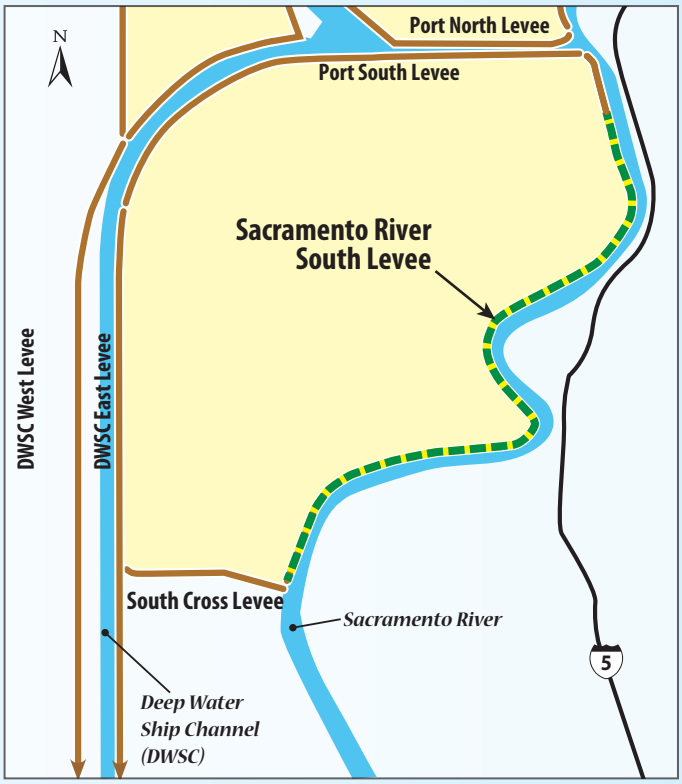
The West Sacramento Area Flood Control Agency (WSAFCA) is proposing the Southport Sacramento River Early Implementation Project (EIP) to implement flood-risk-reduction measures along the Sacramento River South Levee, which protects the Southport community (see map). The project would bring the levee up to Federal and state standards and provide ecosystem restoration and recreation opportunities. An Environmental Impact Statement/Environmental Impact Report (EIS/EIR) is currently underway to determine what effects the project might cause if it was constructed.

WSAFCA and their Federal partner in the EIS/EIR process, the U.S. Army Corps of Engineers, invite you to a scoping meeting to learn about and provide input on the proposed project and the content of the EIS/EIR. Scoping is a process used to inform the public of a proposed activity and provide an opportunity for you to give input on the range of alternatives, environmental effects and any issues of concern. The purposes for scoping are to share information, pose questions and reveal problems early in the environmental studies. Both scoping meetings have the same agenda and topics. A presentation about the project will be given 30 minutes after each meeting begins.

Date: **Thursday, September 15, 2011**

Time: First meeting is from **3:30 to 5:30 p.m.**
Second meeting is from **6:30 to 8:30 p.m.**

Place: **West Sacramento Recreation Center**
Community Room
2801 Jefferson Boulevard
West Sacramento



If you cannot attend the meetings, you can learn more by visiting *http://www.cityofwestsacramento.org/city/flood/*
In addition to providing your input at one of the meetings, you can send written comments to: Megan Smith, Project Manager, ICF International, 630 K Street, Suite 400, Sacramento, CA 95814 **or** to Mr. John Suazo, U.S. Army Corps of Engineers, Sacramento District, Attn: Planning Division (CESPK-PD-R), 1325 J Street, Sacramento, CA 95814.

You can also email comments to:
southportcomments@icfi.com **or** john.suazo@usace.army.mil

Comments will be accepted from August 26, 2011 through September 26, 2011.

US Army Corps of Engineers ®
Sacramento District

WSAFCA
West Sacramento Area Flood Control Agency

September 15 Environmental Scoping Meeting for Southport Levee Improvement Project

Posted on **September 1, 2011**

West Sacramento Area Flood Control Agency (WSAFCA) and the U.S. Army Corps of Engineers are hosting two public scoping meetings for residents to learn abou **levee improvements** in the Southport area of West Sacramento.

The two meetings will be held on Thursday, September 15th from 3:30 to 5:30 p.m. and 6:30 to 8:30 p.m. Both meetings will cover the same agenda and topics.

The project team will present three project alternatives and provide an opportunity for residents to learn about the Environmental Impact Study/Enivronmental Impact Report (EIS/EIR), provide input on the alternative and hear about the next steps involved in the project.

An EIS/EIR is currently underway to determine what effects the levee improvement alternatives may have if constructed. Scoping is the state-mandated process used to inform the public of a proposed project. This

process also provides an opportunity for the public to ask questions and provic input that will be included in the EIS/EIR.

The Southport Early Implementation Project (EIP) will improve nearly six miles of the Sacramento River South Levee. The project was selected for early implementation because construction can be accomplished on an accelerated timeline to promote public safety and meet stricter standards set forth by the federal government.

What: West Sacramento Southport Levee EIP EIS/EIR Scoping meetings

When: Thursday, September 15
First meeting: 3:30 to 5:30 p.m. – presentation at 4 p.m.
Second meeting: 6:30 to 8:30 p.m. – presentation at 7 p.m.

Where: West Sacramento Recreation Center
2801 Jefferson Boulevard
West Sacramento, CA 95691

Highlights:

- Learn about proposed levee alternatives
- Provide input
- Find out next steps
- Get information about the EIS/EIR

Additional Info:
For additional event details, please contact **Megan Smith** at **(916) 737-3000** o **southportcomments@icfi.com**
If you are unable to attend, you may learn more and submit comments by visiting www.cityofwestsacramento.org/city/flood. Public comments will be accepted until September 26, 2011.

Share:

This entry was posted in City Projects, Community Groups, Community Meetings, General Information, Public Safety, Transportation. | Bookmark the permalink.

WESTSACRAMENTO
WWW.CITYILIGHTS.ORG

Home City Website Contact Us RS

From:	City iLights
To:	Powderly, John
Subject:	City iLights Update
Date:	Wednesday, September 07, 2011 11:03:16 AM
Attachments:	cityilights24px.png facebook24px.png twitter24px.png

---

Hello John Powderly,

City iLights Daily Update

Posted on 09/07/2011
1.) September 15 Environmental Scoping Meeting for Southport Levee Improvement Project

Thanks for your interest in the progress and events happening in the City of West Sacramento!

Proof for Aug. 24 Legal Notice
News-Ledger

Notice of Preparation of an Environmental Impact Statement/Environmental Impact Report for the Southport Sacramento River Early Implementation Project

West Sacramento Area Flood Control Agency (WSAFCA) is proposing to undertake the Southport Sacramento River Early Implementation Project. The project would implement flood risk–reduction measures along the Sacramento River South Levee in the city of West Sacramento, Yolo County, California. The project reach extends along the right (west) bank of the Sacramento River south of the Barge Canal downstream approximately 6.4 miles to the South Cross Levee, protecting the Southport community of West Sacramento. The project would bring the levee up to standard with Federal and state flood protection criteria and provide opportunities for ecosystem restoration and public recreation.

Comments solicited. The United States Army Corps of Engineers (USACE), acting as the Federal lead agency under the National Environmental Protection Act, and WSAFCA, acting as lead agency under the California Environmental Quality Act (CEQA), have determined that an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) will be prepared for the project. As detailed in the CEQA Notice of Preparation that is available for review at http://www.cityofwestsacramento.org/city/flood/, USACE and WSAFCA request your input on the scope and content of the EIS/EIR. All interested parties are invited to comment for a period of 30 days, beginning August 26, 2011. Please send comments no later than 5 p.m. on September 26, 2011, by email or standard mail to:

Ms. Megan Smith, Project Manager, ICF International, 630 K Street, Suite 400, Sacramento, CA 95814, Email: southportcomments@icfi.com,

OR

Mr. John Suazo, U.S. Army Corps of Engineers, Sacramento District, Attn: Planning Division (CESPK-PD-R) 1325 J Street, Sacramento, CA 95814, Email: john.suazo@usace.army.mil.

If commenting on behalf of a public agency or non-governmental organization, please include the name of a contact person.

Public meetings to be held. Members of the public may meet with lead agency representatives and provide written comments by attending one of two public scoping meetings to be held on September 15, 2011, at 3:30 p.m. and 6:30 p.m., at the West Sacramento Recreation Center, Community Room, 2801 Jefferson Blvd., West Sacramento, CA 95691.

Aug 24

West Sacramento Press
8-24-11

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT/ ENVIRONMENTAL IMPACT REPORT FOR THE SOUTHPORT SACRAMENTO RIVER EARLY IMPLEMENTATION PROJECT

West Sacramento Area Flood Control Agency (WSAFCA) is proposing to undertake the Southport Sacramento River Early Implementation Project. The project would implement flood risk–reduction measures along the Sacramento River South Levee in the city of West Sacramento, Yolo County, California. The project reach extends along the right (west) bank of the Sacramento River south of the Barge Canal downstream approximately 6.4 miles to the South Cross Levee, protecting the Southport community of West Sacramento. The project would bring the levee up to standard with Federal and state flood protection criteria and provide opportunities for ecosystem restoration and public recreation.

Comments solicited. The United States Army Corps of Engineers (USACE), acting as the Federal lead agency under the National Environmental Protection Act, and WSAFCA, acting as lead agency under the California Environmental Quality Act (CEQA), have determined that an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) will be prepared for the project. As detailed in the CEQA Notice of Preparation that is available for review at http://www.cityofwestsacramento.org/city/flood/, USACE and WSAFCA request your input on the scope and content of the EIS/EIR. All interested parties are invited to comment for a period of 30 days, beginning August 26, 2011. Please send comments no later than 5 p.m. on September 26, 2011, by email or standard mail to:

Ms. Megan Smith, Project Manager, ICF International, 630 K Street, Suite 400, Sacramento, CA 95814, Email: southportcomments@icfi.com, *OR*

Mr. John Suazo, U.S. Army Corps of Engineers, Sacramento District, Attn: Planning Division (CESPK-PD-R) 1325 J Street, Sacramento, CA 95814, Email: john.suazo@usace.army.mil.

If commenting on behalf of a public agency or non-governmental organization, please include the name of a contact person.

Public meetings to be held. Members of the public may meet with lead agency representatives and provide written comments by attending one of two public scoping meetings to be held on September 15, 2011, at 3:30 p.m. and 6:30 p.m., at the West Sacramento Recreation Center, Community Room, 2801 Jefferson Blvd., West Sacramento, CA 95691.

au24

Sacramento Bee 8-24-11

NO 480 PUBLIC NOTICE

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For Immediate Release
September 6, 2011

Contact: Lindsey Simoncic, Crocker & Crocker
(916) 205-4374

September 15 Environmental Scoping Meeting for Southport Levee Improvement Project

West Sacramento Residents Invited to Provide Input on Alternatives

West Sacramento, Calif.- West Sacramento Area Flood Control Agency (WSAFCA) and the U.S. Army Corps of Engineers are hosting two public scoping meetings for residents to learn about levee improvements in the Southport area of West Sacramento. The two meetings will be held on Thursday, September 15 from 3:30 to 5:30 p.m. and 6:30 to 8:30 p.m. Both meetings will cover the same agenda and topics.

The project team will present three project alternatives and provide an opportunity for residents to learn about the Environmental Impact Study/Enivronmental Impact Report (EIS/EIR), provide input on the alternatives and hear about the next steps involved in the project.

An EIS/EIR is currently underway to determine what effects the levee improvement alternatives may have if constructed. Scoping is the state-mandated process used to inform the public of a proposed project. This process also provides an opportunity for the public to ask questions and provide input that will be included in the EIS/EIR.

The Southport Early Implementation Project (EIP) will improve nearly six miles of the Sacramento River South Levee. The project was selected for early implementation because construction can be accomplished on an accelerated timeline to promote public safety and meet stricter standards set forth by the federal government.

What West Sacramento Southport Levee EIP EIS/EIR Scoping meetings

When Thursday, September 15
First meeting: 3:30 to 5:30 p.m. – presentation at 4 p.m.
Second meeting: 6:30 to 8:30 p.m. – presentation at 7 p.m.

Where West Sacramento Recreation Center
2801 Jefferson Boulevard
West Sacramento, CA 95691

Highlights

- Learn about proposed levee alternatives
- Get information about the EIS/EIR
- Provide input
- Find out next steps

Additional Info For additional event details, please contact Megan Smith at (916) 737-3000 or southportcomments@icfi.com

If you are **unable to attend**, you may **learn more** and **submit comments** by **visiting** www.cityofwestsacramento.org/city/flood. Comments will be accepted from August 26 to September 26, 2011.

THE
"Your hometown
WEST SACRAMENTO P

Volume 21, Number 28 Wednesday, September 7, 2011

Trees – not bad for levees after all

By Carol Bogart
EDITOR

Trees or no trees? The Army Corps of Engineers' "vegetation policy" for levees has been a moving target.

When West Sac upgraded the levee by CalSTRS and the I-Street Bridge to conform to post-Hurricane Katrina FEMA standards, it installed a 'slurry' (soil-bentonite mix) wall down through 500 feet of levee, said city officials at the time.

Prior to the fix, according to federal documents, it, and much of the rest of the city's 50+ miles of levee system, could not be certified for even a 100 year flood event (a serious flood that has a 1 percent chance of happening in any given year), let alone provide the 200-year-flood protection the State of California now requires in urban areas.

On the I-Street levee, the Corps wouldn't allow anything growing on its re-graded slopes except grass. Tearing out existing vegetation, which, according to Michael Bessette, West Sacramento Flood Protection Manager, included few trees, nonetheless, "added $120,000 to the project."

When big trees designated 'heritage' trees based on the diameter of their trunks are taken out, money has to go in a mitigation bank to buy new trees to be planted elsewhere. Southport, for example, got a lot of new saplings (15-gallon size trees) planted near housing developments such as Bridgeway Island as 'mitigation' for trees West Sac lost when the connection to Sacramento's waste water treatment plant went in, said West Sac Urban Forest Manager Dena Kirtley.

It will be awhile before such trees are big enough to support such things as hawk's nests.

When the I-Street levee was upgraded, and until a not-yet-released Corps study favorable to trees becomes official policy, it was suspected that trees and their roots weaken levees. The roots, it was suspected, were a pathway for leaks.

The Environmental Impact ct Report for the state's proposed site in Broderick for a new Indian Museum found that the stretch of the levee (not scheduled for upgrading) between the I Street levee upgrade and the stretch being fixed behind The Rivers – leaks under and through it and is too short.

Right now, the levee work behind The Rivers housing development in Broderick has resulted in removing trees – 37 of them, Bessette confirms – adding "a couple hundred thousand dollars" to the cost of the levee repairs," he told the Bee, and costing the endangered Swainson's Hawk important habitat.

The Corps' "trees" study, according to the recent story in the Sacramento Bee, found that contrary to the view that tree roots were a path for levee seepage, in fact, tree roots help hold levee dirt in place.

As yet undetermined, though, is whether roots contribute to erosion from passing water. Also, trees at the top of levees may be a risk to levees if they topple in a wind storm, the study said.

Future levee work in Southport,

See TREES page 3

Yolo is loaded with Magpies!

By Carol Bogart
EDITOR

Think you see a lot of magpies in West Sac? Big flocks of them even?

Yep, you do.

Yolo County scored second only to Sacramento County when Yellow-billed Magpies were surveyed earlier this year.

Yellow-billed Magpies were observed in 24 of California's 58 counties during the recent volunteer survey sponsored by Audubon California to help support the conservation of this dynamic species, said Audubon California spokesman Garrison Frost in a press release. The survey – held June 3-6 – was the third annual effort to rally birders all around the state to venture outside in search of the Yellow-billed Magpie.

"In a lot of ways this survey is a great celebration of this California bird," said Andrea Jones, Audubon California's director of Important Bird Areas. "Even though the rain made the birds hard to find, we had more people out in the field than ever before, and even added two additional counties over last year."

About 260 volunteers submitted checklists to the survey this year, more than double the number of the first survey in 2009, Frost said. "Given that many people worked in teams, about 500 people in total participated," he added.

Popular among birders and compelling for conservationists, the Yellow-billed Magpie lives only in California's Central Valley and Coastal Ranges, and may be may experiencing a comeback after major declines due to habitat loss, West Nile Virus and pesticide use, said Frost. Voters in an online poll named the Yellow-billed Magpie Audubon California's Bird of the Year for 2009, he said.

Volunteers in the June survey counted 3,200 birds across 24 counties (up from 18 counties in 2009), with the most birds counted in Sacramento, Yolo, and San Luis Obispo counties., Frost reported.

See MAGPIES page 3

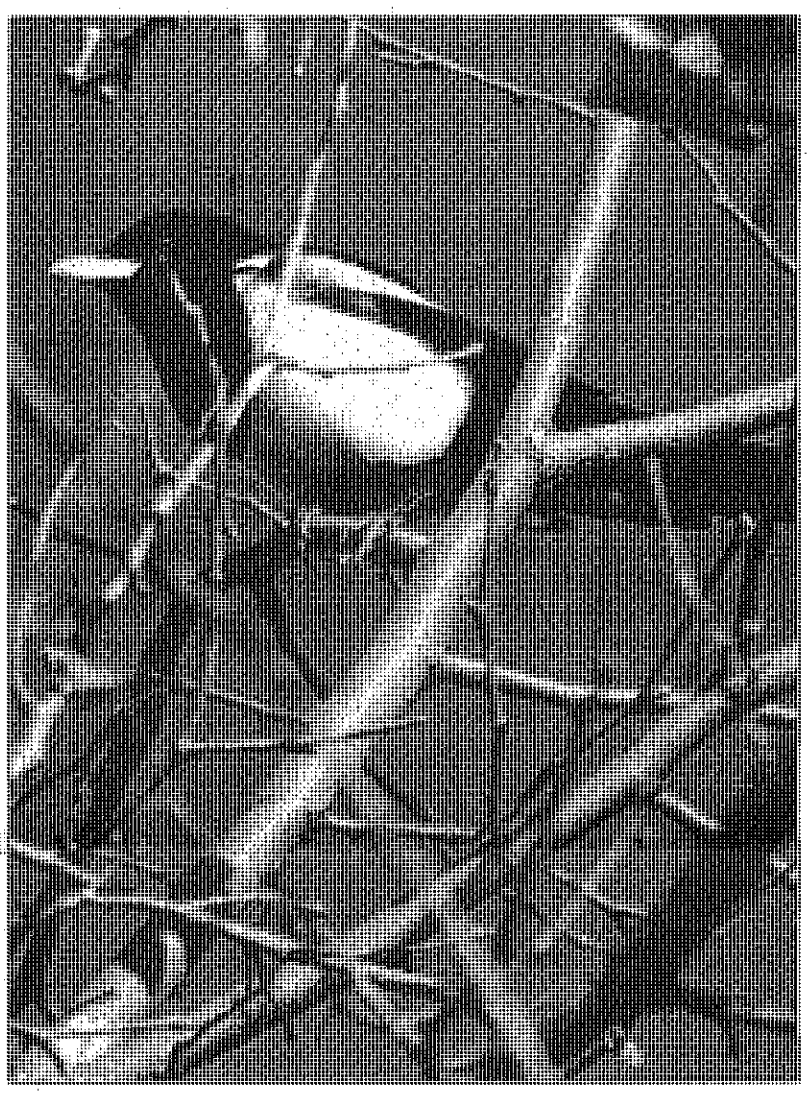

PHOTO BY SONNY MENCHER
Yellow-billed Magpie photographed at the Yolo Bypass Wildlife Area during Audubon California's recent magpie count. The bird is rare elsewhere, but abundant in Yolo and Sacramento Counties.

Sept. 1 been a

By Carol Bogart
EDITOR

Last week, researchers announced a break through in treatments for victims in the event of a terrorist chemical attack.

Here? In America? On our own soil?

Now we know.

Yes.

Such an attack can happen.

Efforts to prevent future attacks have included intense study of 9-11 itself.

At UC Davis, experts on Al-Qaida and Osama bin Laden include UC Davis religious studies professor Flagg Miller who has studied al-Qaida's ideology before and after 9/11, as well as Osama bin Laden's leadership and the impact of his death on

Fall cl

By Carol Bogart
EDITOR

Got big stuff like tires you want to get rid of?

West Sac's fall Bulky Waste Drop-off event is scheduled for Sept. 21-24 at 540 Harbor Blvd., said West Sacramento Refuse & Recycling Division spokeswoman Paulina Rosenthal in a press release.

The event is free. Waste can

Feds gi Yolo Fo

By Carol Bogart
EDITOR

WOODLAND, CA – Wednesday, August 31st Congressman Mike Thompson (CA-1) on Aug. 31 met with representatives from the Food Bank of Yolo, the local Farm Service Agency and neighbor

WHAT'S INSIDE

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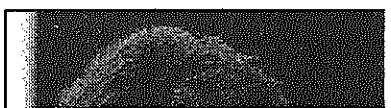
Alcohol at the West Sac pool?



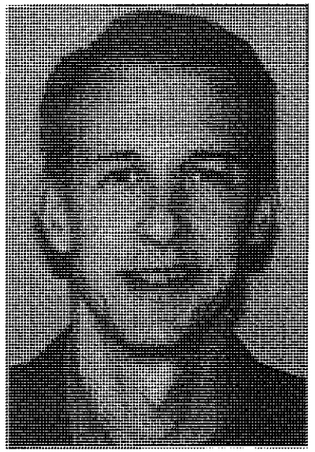
By Carol Bogart
EDITOR

located on school district property.

Learning that the cancellation

LEVEES

Continued from Page 1



Michael Bessette
West Sac Flood Manager

according to the Bee, "puts thousands of trees at risk."

The tree study, the Bee reported, is currently undergoing internal technical review at the Corps. The levee tree research included ground penetrating radar and other tools at various levee locations, including Sacramento.

Meantime, Bessette is scheduled to make a presentation to the West Sac Chamber of Commerce from 11:45 a.m. - 1:30 p.m. Sept 15.

The West Sac Press asked Bessette to share with readers what he plans to say. The following is what he sent us:

"Levee construction is underway throughout West Sacramento on four separate projects and planning for future levee improvements in Southport is moving forward.

"In the north area of the city, the West Sacramento Area Flood Control Agency (WSAFCA) is managing two levee improvement projects: the CHP Academy and the Rivers Early Implementation Projects.

"The US Army Corps of Engineers (Corps) is also in charge of two (other) levee improvements, a slip repair of the Yolo Bypass levee north of Interstate 80 (EDITOR: According to the Federal Register, the levee was 'bulging' due to high water in 2006) and a new setback levee along the Sacramento River in the Southport area just south of Stone Locks.

"The projects under construction, combined with two projects already completed (the I Street Early Implementation Project and the first Yolo Bypass slip repair), will improve over three miles of levees to meet current 200-year flood standards.

"WSAFCA is presently studying the next Early Implementation Project (EIP), called the Southport Sacramento River EIP.

"At six miles (in length), the Southport EIP would improve the largest portion of the city's levees to date. Currently in the design phase, various levee alternatives are being examined by WSAFCA that include different kinds of levee treatments, including in-place repair, adjacent levee repair, setback levees, and seepage barriers.

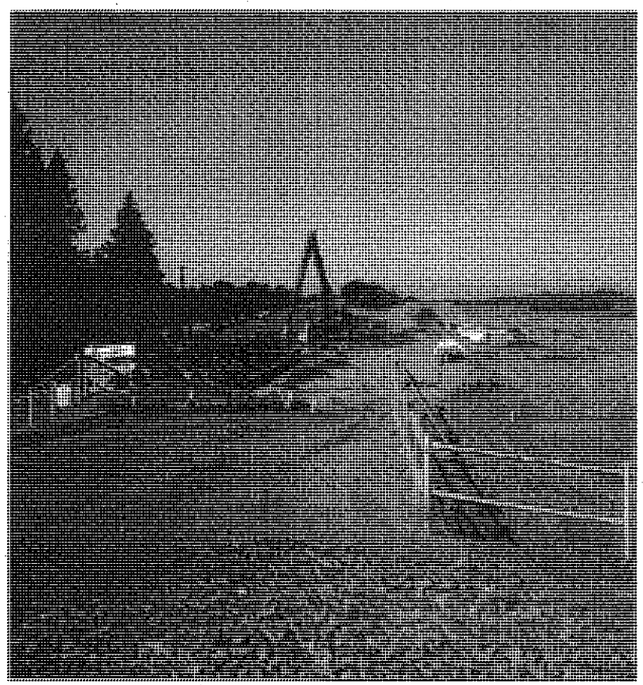
"The final design is likely to include a combination of these different methods for reducing flood risks.

"WSAFCA's state partner, the Department of Water Resources (DWR), may offer incentives for setback levees in exchange for environmental restoration (EDITOR: ie: leaving trees and other vegetation on the existing levee undisturbed).

"However," said Bessette, "the city will not implement setbacks in areas where it does not make sense to do so after considering all issues and impacts related to development, operation and maintenance.

"Recently, WSAFCA held a meeting with South River Road residents located between Davis Road and Gregory Avenue, where preliminary design studies indicate feasible approaches to levee improvements may affect existing homes."

The objective of the meeting, Bessette said, was to inform property owners of the city's emerging levee concerns at the soonest time and begin to acquaint property owners with the real estate acquisition process. (EDITOR: If it's determined that a setback levee best serves the public good, ie: the broader area is best protected from a catastrophic flood by leaving existing trees in place and putting in a new levee further back from the river – under eminent domain, the city has the right to remove 'obstructions' (houses) in the way of that 'infrastructure' (the setback levee), paying homeowners 'fair market value for their homes.)



COURTESY PHOTO

West Sac levee work by the CHP Academy as preparations are made to install a slurry wall. Before a slurry wall can be constructed in an existing levee, all vegetation must be removed. Thirty seven trees were torn out recently to prepare for installing a slurry wall in the levee behind The Rivers housing development in Broderick. At least one large tree removed was home to an endangered Swainson's Hawk.

"After WSAFCA has selected a Preferred Project alternative," said Bessette, "the city will engage in formal real estate acquisition proceedings with owners whose properties would be affected by the project."

"WSAFCA's goal is to settle all real estate acquisitions with the best possible outcome for all parties involved."

Bessette said that Ken Ruzich, WSAFCA General Manager and General Manager of Reclamation District 900, when asked about the meeting with property owners, Ruzich told him, "We understand how serious and sensitive this issue is for property owners along South River Road and we do not take that fact lightly.

"We are in a situation where we have to provide the highest level of flood protection as quickly and completely as possible for the entire city. Unfortunately, benefits to the whole city may come with unavoidable impacts to a few. We're working diligently to achieve the greatest public benefit with the least private injury."

Bessette said WSAFCA and the Corps are hosting two public meetings on Sept. 15: 3:30 to 5:30 p.m. and 6:30 to 8:30 p.m. "The project team will present study alternatives and provide an opportunity for residents to learn about the Environmental Impact Study/Environmental Impact Report (EIS/EIR), and provide input on scope of investigations conducted to prepare the EIS/EIR," he said. "Residents may also submit written comments by visiting *www.cityofwestsacramento.org/city/flood*. Comments will be accepted until Sept. 26. He added, "The Sacramento Bee published an article on Aug. 27 that reported possible changes in the USACE regulations about vegetation on levees. These changes illustrate the dynamic regulatory circumstances that govern the improvement, maintenance and funding of levees.

"WSAFCA is coordinating actively with (the Corps) so that changes in the federal guidance are integrated into WSAFCA's program. Wherever possible, WSAFCA's Early Implementation Program seeks to avoid or minimize the loss of trees and other important environmental and community assets.

"While the completed I Street EIP and two EIPs under construction this year required removal of trees in order to construct the levee improvements and also to comply with levee regulations, WSAFCA was able to mitigate and will continue to mitigate the loss of trees by creating and enhancing landscapes and open spaces within the city that directly benefit the community." (EDITOR: If not the hawks.)

Bessette said West Sac "continues to coordinate with the Federal Emergency Management Agency (FEMA) on changes to the National Flood Insurance Program (NFIP) and West Sacramento's next flood zone designation.

"The city is presently mapped as a FEMA Zone 'X.'" (EDITOR: An 'X' designation means that cities so-designated must engage in flood protection 'outreach' programs, such as informing citizens how to obtain flood insurance, but does not impact such things as whether developers have to build houses on stilts to keep them above the flood plain.) "Last year," Bessette continued, "FEMA suspended the national flood zone re-mapping process to revise the agency's protocol for modeling flood plains. FEMA continues to work on the computer modeling protocol and intends to solicit public input on a new draft model sometime between the end of this year and early in 2012.

"For now, the city's Zone 'X' mapping will remain and city staff will continue to closely monitor and coordinate with FEMA. City staff is also engaged in Congressional reauthorization of the NFIP with changes to FEMA Flood Zone regulations, many of which have been proposed by the city of West Sacramento. (EDITOR: Unless levees in low lying areas such as Southport meet present-day flood protection standards, without FEMA-certification, Federal Emergency Management Agency rezoning could mean a designation on flood maps that makes flood insurance premiums costly. If consumers avoid houses with high flood insurance premiums, developers won't build them. Many experts on the economy, both national and local, say the key to America's economic recovery is recovery in the housing market.)

Bessette said, "West Sacramento's efforts to improve the city's flood protection are advancing on several fronts at the same time. Flood risk reduction is the Number 1 Priority of ongoing work to improve regulations; study; design; fund and build levee improvements. Along the way, WSAFCA is dedicated to minimizing harm to private property owners and the environment, and delivering benefits to the community that complements the primary objective of flood protection."

Appendix B

Public Meeting Materials

Appendix B contains copies of the following materials:

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Display boards 32

Power Point presentation 60

Fact sheet 69

Comment card 71

Program & Project Overview

Potential Measures

Environmental Considerations

Comments?

Thank you for your interest in this public safety project. Please provide us with your input on the content of the Environmental Impact Statement/ Environmental Impact Report here.

Welcome to the Southport Sacramento River Early Implementation Project Public Scoping Meeting

September 15, 2011

West Sacramento Levee Improvements Program Purpose & the Southport Sacramento River Early Implementation Project

In 2007 the West Sacramento Area Flood Control Agency (WSAFCA) initiated the West Sacramento Levee Improvements Program (WSLIP) to reduce the risk of a catastrophic flood event in West Sacramento. The City of West Sacramento, as part of WSAFCA, and in collaboration with the California Department of Water Resources, embarked on a comprehensive evaluation of the levees protecting West Sacramento to determine deficiencies and develop treatment measures. As the agency with authority over alterations to Federal levees, the U.S. Army Corps of Engineers (USACE) will act as the lead agency as it relates to the Federal environmental review process. Based on findings of the levee evaluation, the objectives of the WSLIP are to:

- achieve a minimum of "200-year" level of flood protection for the City of West Sacramento in line with Federal and state flood protection criteria;
- construct levee improvements as soon as possible to reduce flood risk;
- construct levee improvements that are politically, socially, and environmentally acceptable; and
- provide recreational and open space elements for the city that are compatible with flood improvement measures.

Since 2007, three Early Implementation Projects (EIP) have been initiated within the WSLIP boundary. An EIP is a project that is implemented in advance of the overall WSLIP construction in order to address critical areas where the levee's deficiency is well-defined and where appropriate measures to treat the levee are known. The three EIP sites initiated to-date are the I Street Bridge site (construction completed in 2008), the Rivers site (under construction) and the CHP Academy site (under construction).

West Sacramento Area Flood Control Agency (WSAFCA) is a Joint Powers Authority created in 1994 to coordinate planning and construction of flood protection facilities within its boundaries and to finance the local share of flood control projects. Member agencies of WSAFCA are the City of West Sacramento, Reclamation District 900, and Reclamation District 537.

The U.S. Army Corps of Engineers (USACE) provides engineering services to the nation by planning, designing, building and operating water resources projects, including flood control projects on the Sacramento River. USACE is charged with oversight of alterations to Federal levees.

Now, WSAFCA is proposing a fourth EIP called the Southport Sacramento River EIP. Implementation of measures at this site will improve the levee that runs along the west bank of the Sacramento River (referred to as the Sacramento River South Levee) to enhance flood protection for the community of Southport. The EIP would improve approximately 6.4 miles of levee and would bring the levee up to Federal and state flood protection standards.

How Did We Get Here?

Over the past decades, there have been several flood protection evaluations and improvements in the City of West Sacramento.

1986-1987: Significant rainfall event occurs in Sacramento region; USACE recommends significant improvements for West Sacramento flood protection.

1987-1990: City obtains Federal funding and authorization for two levee improvements.

1990-1993: Sacramento Urban Levee Reconstruction Project completes building of stability berm along the Sacramento River in Southport. Costs were $9 million; local share was $800,000.

1994: WSAFCA is created to coordinate, fund and construct major flood protection improvements.

1997: Significant rainfall event occurs in Sacramento region and levees sustain damage.

1999-2002: USACE's West Sacramento Project strengthened five miles of levees adjacent to the Sacramento and Yolo bypasses. Costs were approximately $32.1 million; local share was $3.6 million.

2005: USACE issues new levee design standards.

2006: State performs critical erosion repairs on three sites in West Sacramento.

2006: WSAFCA, in collaboration with California Department of Water Resources, embark on comprehensive evaluation of levees.

2007: WSAFCA proposes the WSLIP. This is a comprehensive program to bring the city's levees up to standard.

2007: USACE constructs a seepage berm at Davis Road and South River Road under Public Law 84-99.

2008: The I Street Bridge EIP is constructed under WSLIP after USACE approved Section 408 permission requested by WSAFCA. The Rivers and CHP Academy EIPs are proposed.

2009/2010: Joint USACE & WSAFCA environmental public scoping meeting is held for the WSLIP, including The Rivers and CHP Academy EIPs. The WSLIP draft EIS/EIR is released.

Winter 2010: USACE begins construction on a setback levee project along the west bank of the Sacramento River south of the Stone Locks as part of the Sacramento River Bank Protection Project. Anticipated completion is fall 2012.

Summer 2010: WSAFCA and USACE begin planning the Southport Sacramento EIP.

Mid-2011: The Rivers and CHP Academy EIPs complete environmental review and are approved for construction. Construction on the two sites begins. The environmental review process starts for Southport Sacramento River EIP in August.

West Sacramento Area Levee Projects

During the past 10 years, several key flood protection projects have been initiated or constructed by various government agencies or agency partnerships in the city of West Sacramento. Below is a list of projects that have been proposed, are in the planning stage, are under construction, or that have been constructed.

I Street Bridge Site. Construction of this EIP was completed in November 2008. The project consisted of a 475 foot-long slurry wall that is approximately 37 feet in depth. The slurry wall will protect from seepage, tree removals, and the reshaping of the levee. The project also involved removing vegetation according to the USACE standards, and relocating a major communications utility. The City's Riverwalk extension project commenced soon after construction was completed.

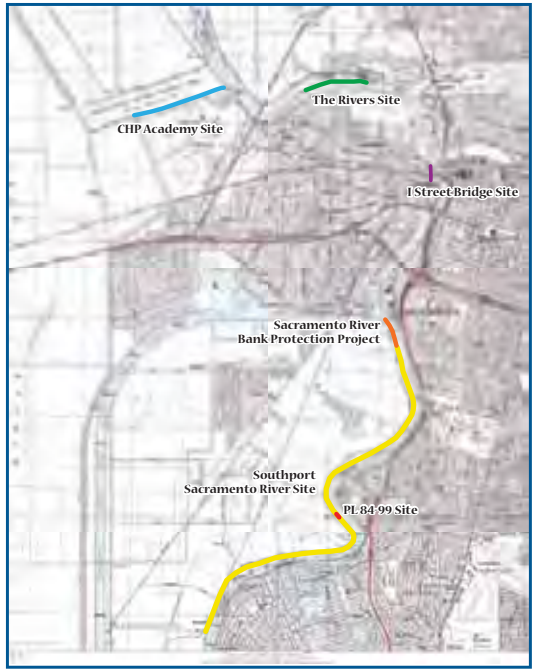
CHP Academy Site. Environmental approval for construction of this project was gained in mid-2011. This site is approximately 6,500 feet in length and is the levee that runs along the Sacramento Bypass. Deficiencies at this site concern through-seepage and levee geometry, along with areas of under-seepage and instability.

The Rivers Site. Environmental approval for construction of this project was gained in mid-2011. The Rivers EIP area is approximately 3,000 feet long and is located on the Sacramento River North Levee, just north of the confluence of the Sacramento and American rivers. Levee deficiencies at this site relate to geometry, stability, and under-seepage.

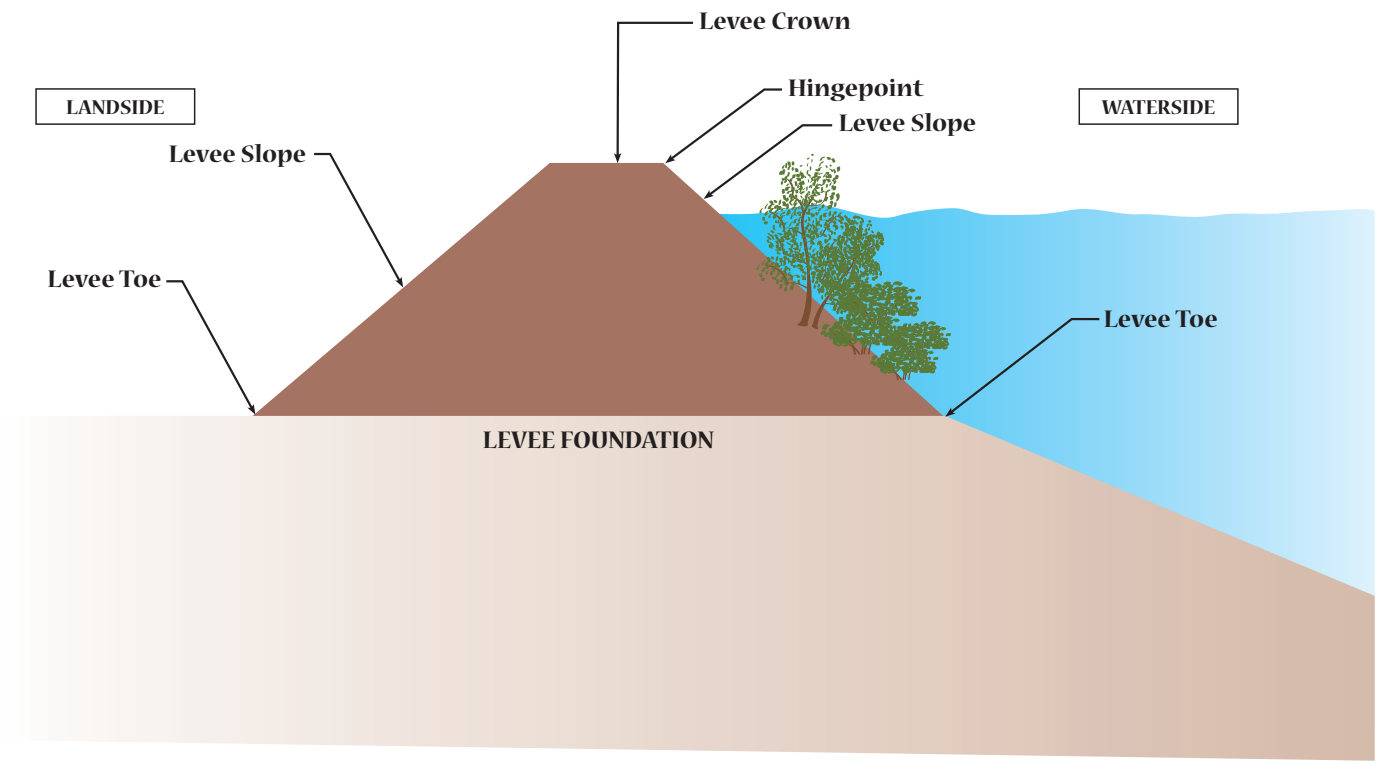
Sacramento River Bank Protection Project. Construction began in December 2010 on a setback levee project along the west bank of the Sacramento River in the Southport area, just south of the Stone Locks. This is a separate effort led not by WSAFCA, but by the USACE under the Sacramento River Bank Protection Project. The project is scheduled for completion in 2012.

Southport Sacramento River Site. This proposed site would be implemented to reduce the risk of flooding to the Southport community. Measures would be implemented along 6.4 miles of the levee along the west bank of the Sacramento River. This would bring the levee up to current Federal and state standards.

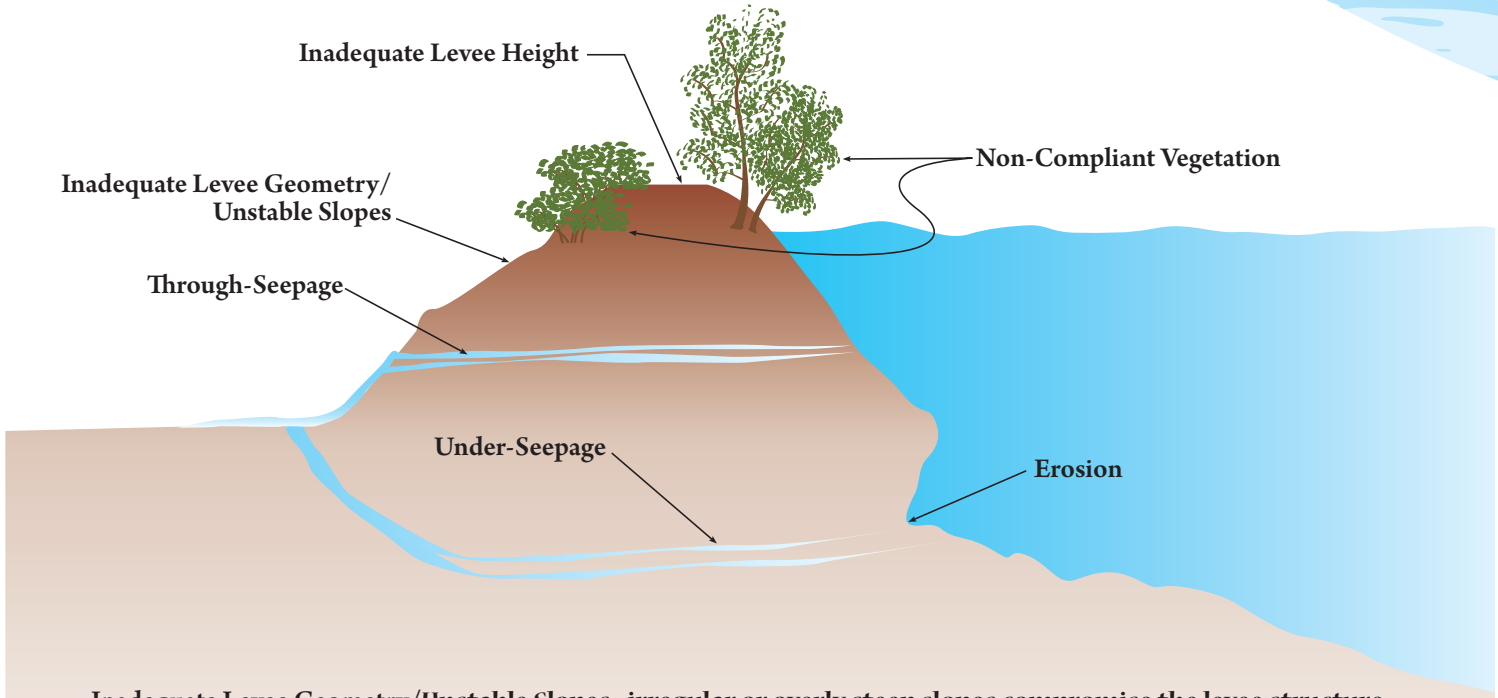
Public Law 84-99. USACE constructed a seepage berm at Davis Road in 2007 under PL 84-99. PL 84-99 establishes a fund for emergency response preparations for natural disasters. The seepage berm was constructed to fight boils caused by under-seepage.



An "Inside Look" at a Levee



Typical Levee Deficiencies



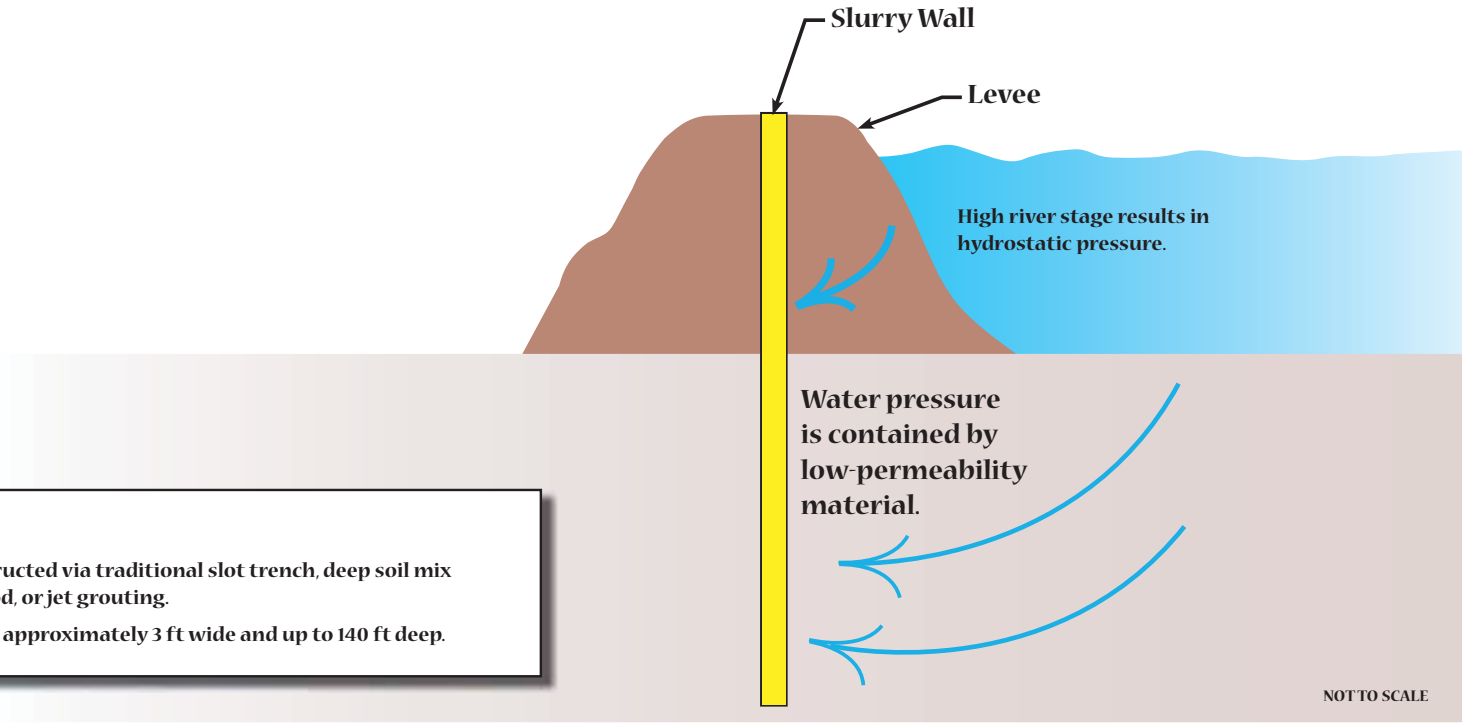
- Inadequate Levee Geometry/Unstable Slopes - irregular or overly steep slopes compromise the levee structure
- Inadequate levee height - levee height may be too low relative to predicted water levels
- Non-Compliant Vegetation - can lead to levee instability and hinder levee monitoring and maintenance
- Erosion - water flow, wakes and waves, remove soil material, damaging the levee
- Seepage

South of Davis Road on South River Road looking southeast at the waterside slope of the levee, on which the Southport Sacramento River EIP is proposed to be implemented.

Slurry Cutoff Wall

Concept:

Water pressure is contained and dispersed by a low-permeability wall constructed within the levee cross section.



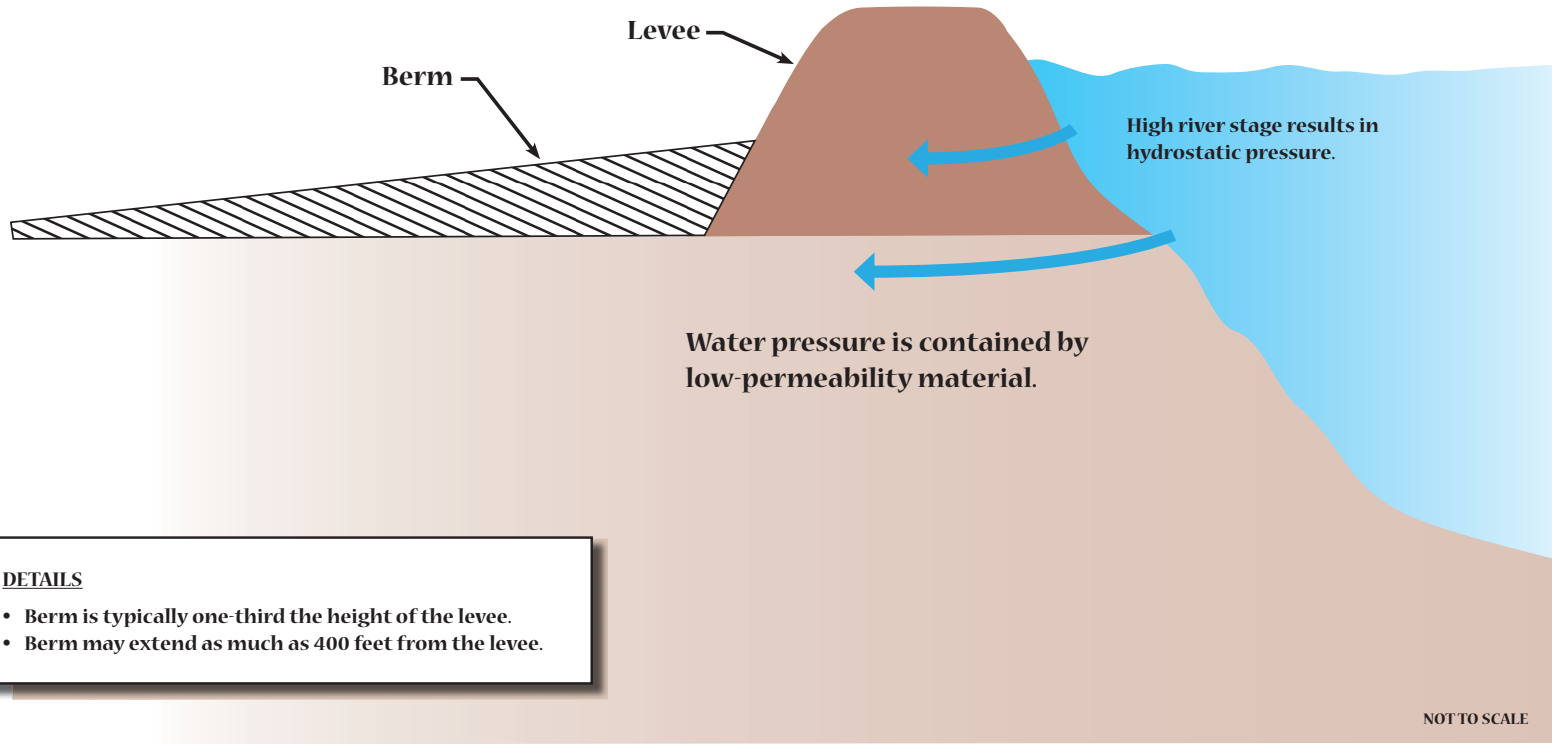
DETAILS

- Constructed via traditional slot trench, deep soil mix method, or jet grouting.
- Wall is approximately 3 ft wide and up to 140 ft deep.

Seepage Berm

Concept:

Water pressure is contained and dispersed by a thickened soil layer.



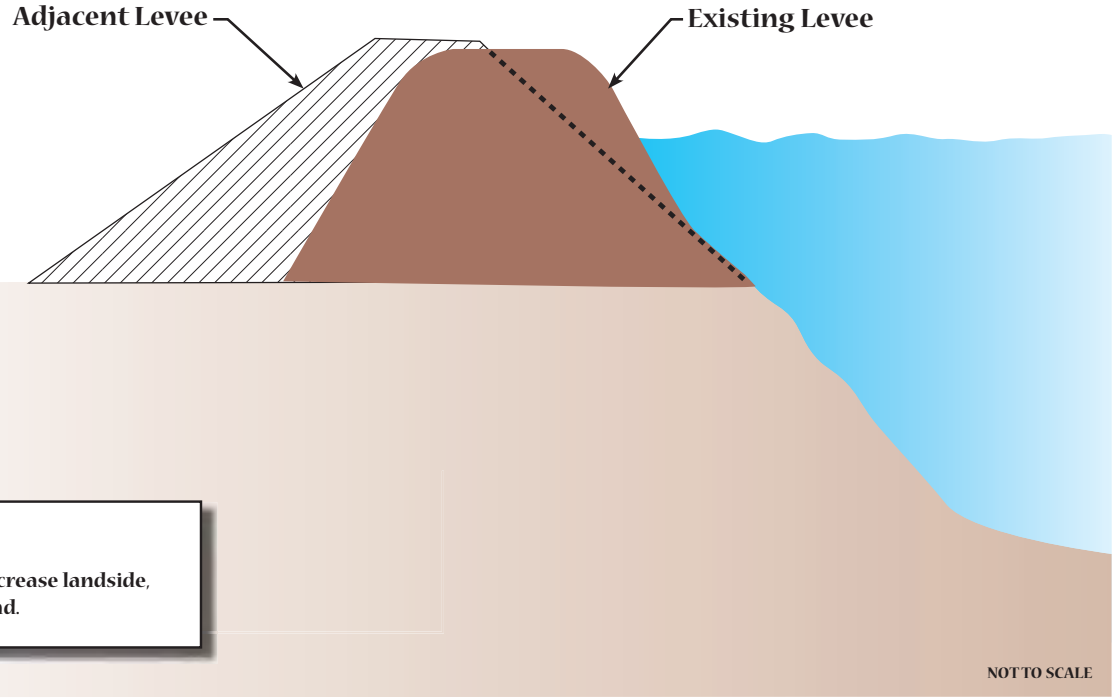
DETAILS

- Berm is typically one-third the height of the levee.
- Berm may extend as much as 400 feet from the levee.

Adjacent Levee

Concept:

A new embankment strengthens the existing levee and enlarges the slopes.



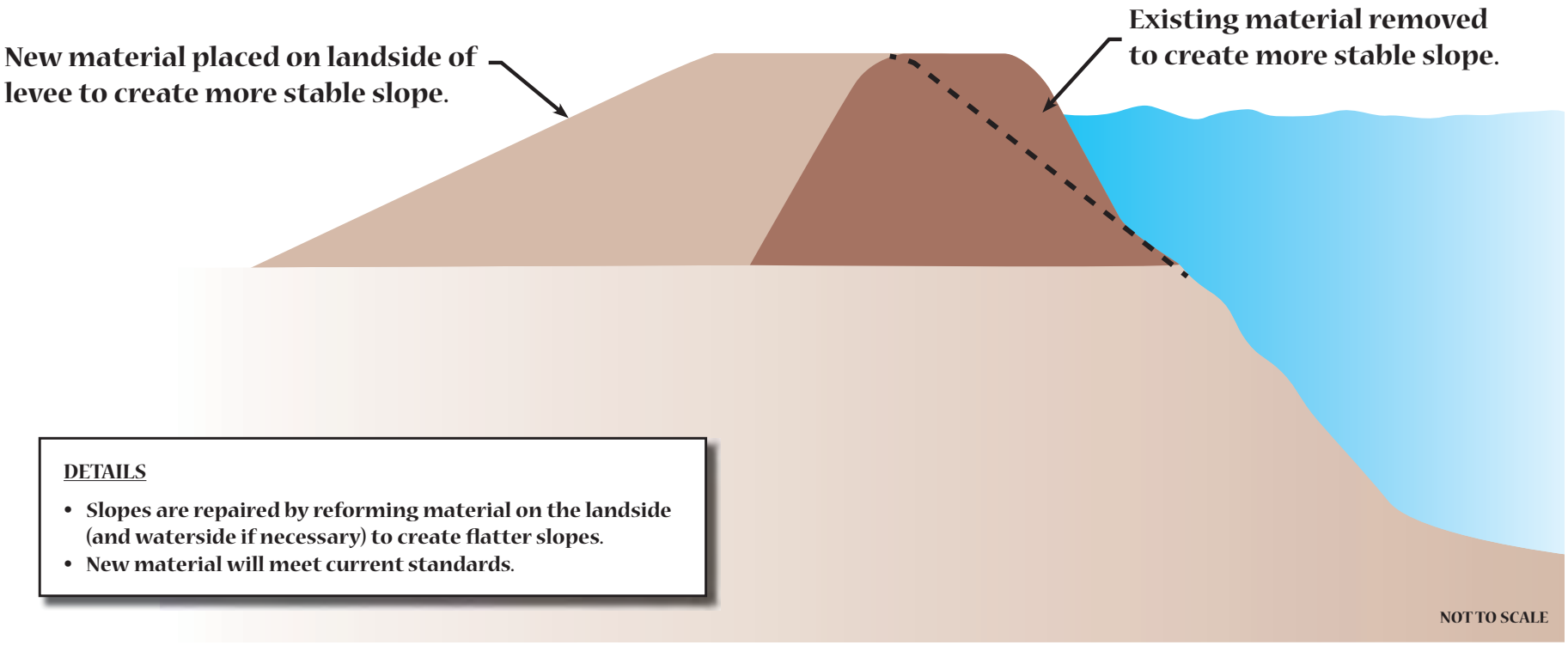
DETAILS

- The crown of the levee would increase landside, with a 3:1 slope to existing ground.

Slope Flattening

Concept:

Flatter slopes are more stable and less susceptible to erosion.



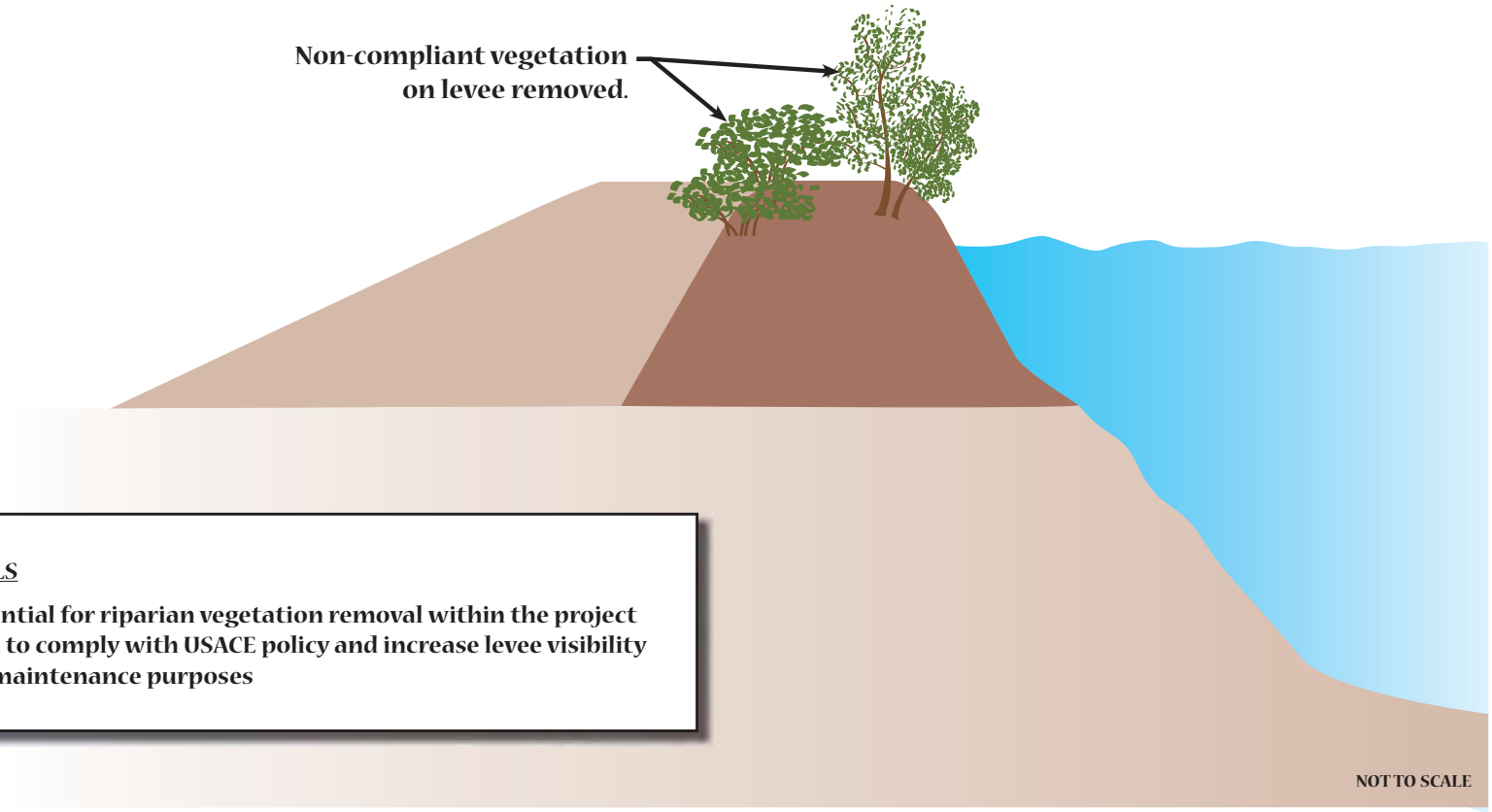
DETAILS

- Slopes are repaired by reforming material on the landside (and waterside if necessary) to create flatter slopes.
- New material will meet current standards.

Vegetation Removal

Concept:

Non-compliant vegetation may inhibit levee maintenance and performance monitoring.



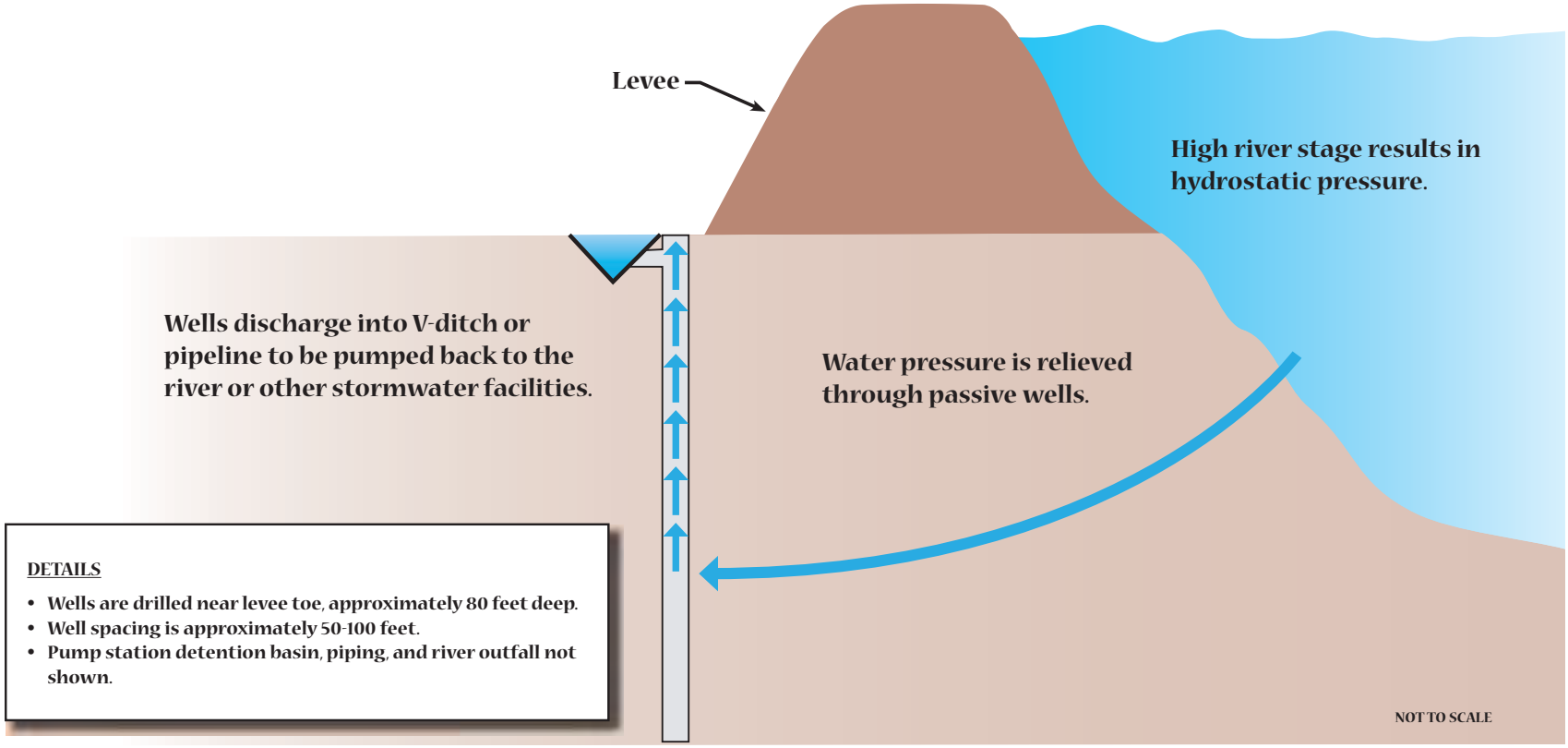
DETAILS

- Potential for riparian vegetation removal within the project area to comply with USACE policy and increase levee visibility for maintenance purposes

Relief Wells

Concept:

Water pressure is relieved via passive wells, which direct water discharge into a collection system.



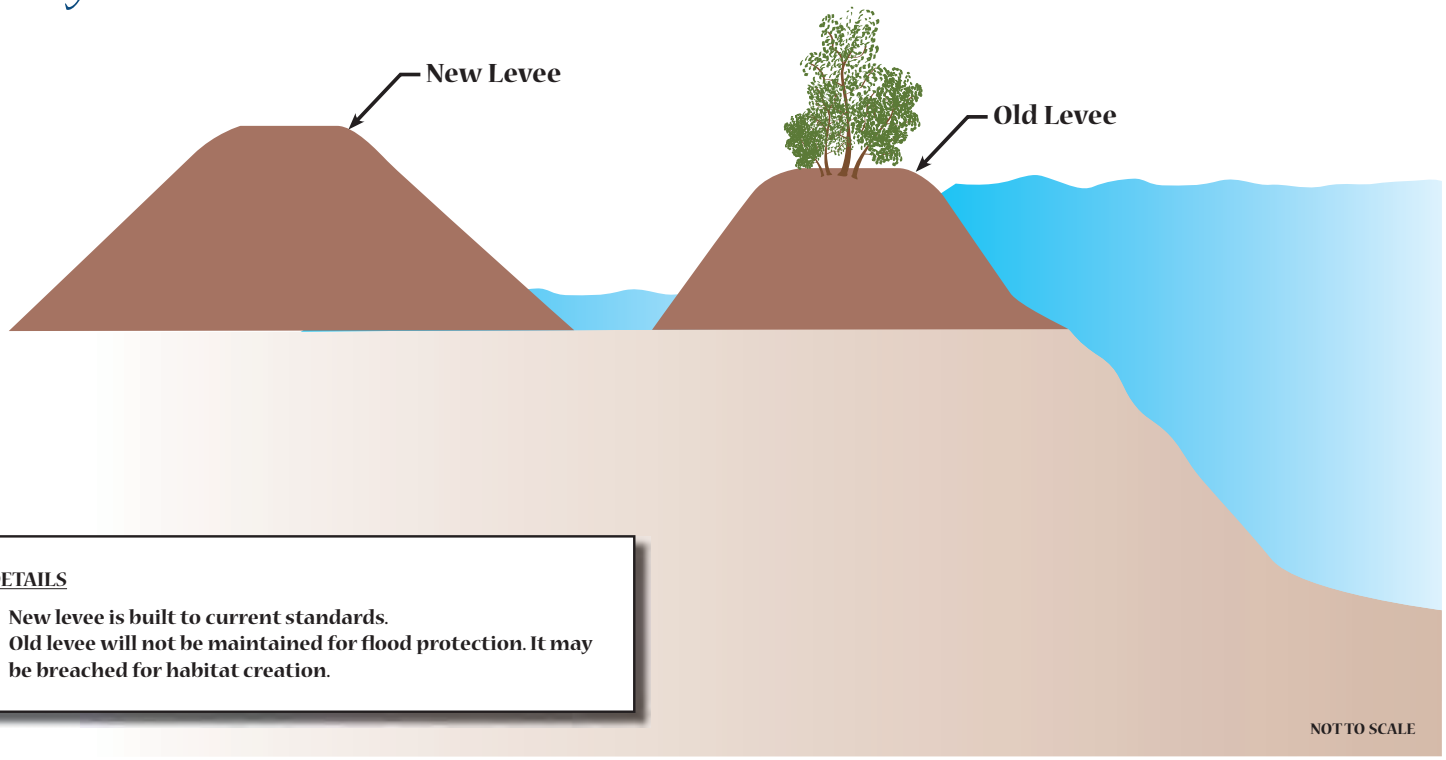
DETAILS

- Wells are drilled near levee toe, approximately 80 feet deep.
- Well spacing is approximately 50-100 feet.
- Pump station detention basin, piping, and river outfall not shown.

Setback Levee

Concept:

A new levee is built toward the landside of an existing levee where the existing levee is not readily repairable or where more flooding capacity is desired.



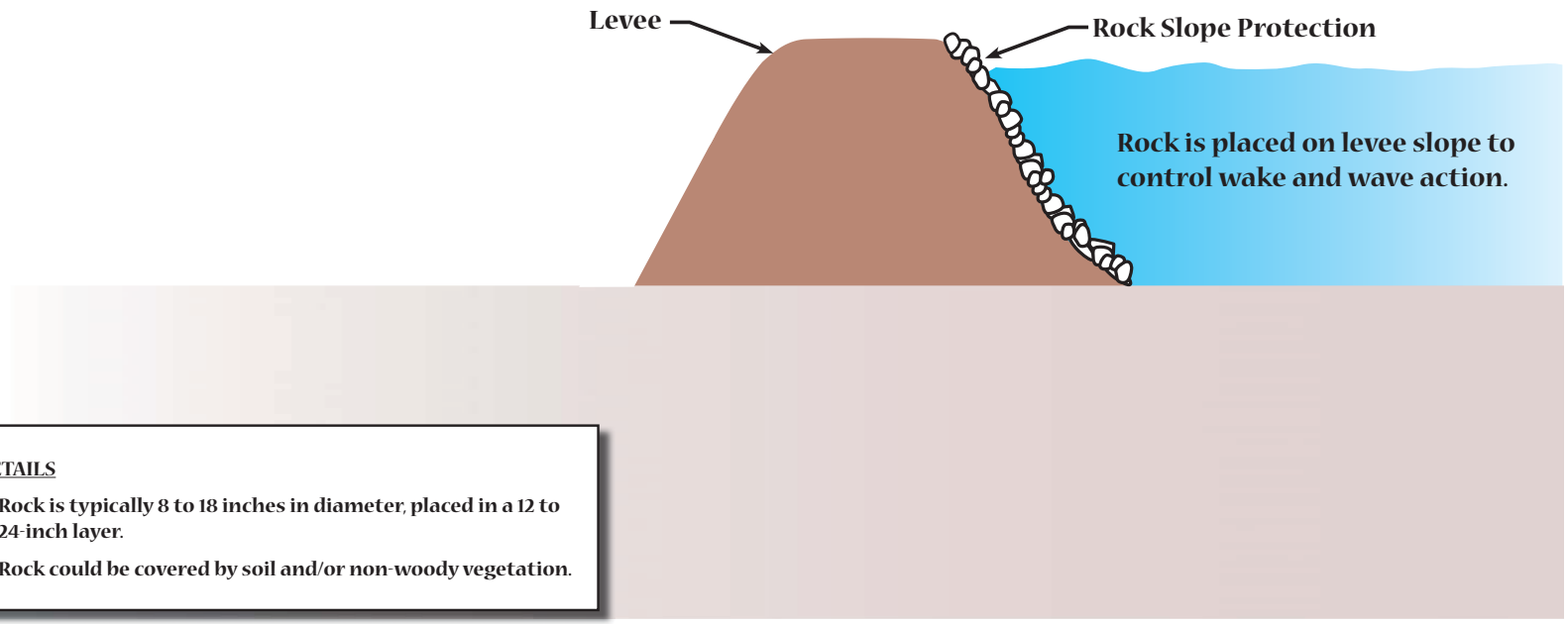
DETAILS

- New levee is built to current standards.
- Old levee will not be maintained for flood protection. It may be breached for habitat creation.

Rock Slope Protection

Concept:

Water-side erosion is prevented by placement of rock.

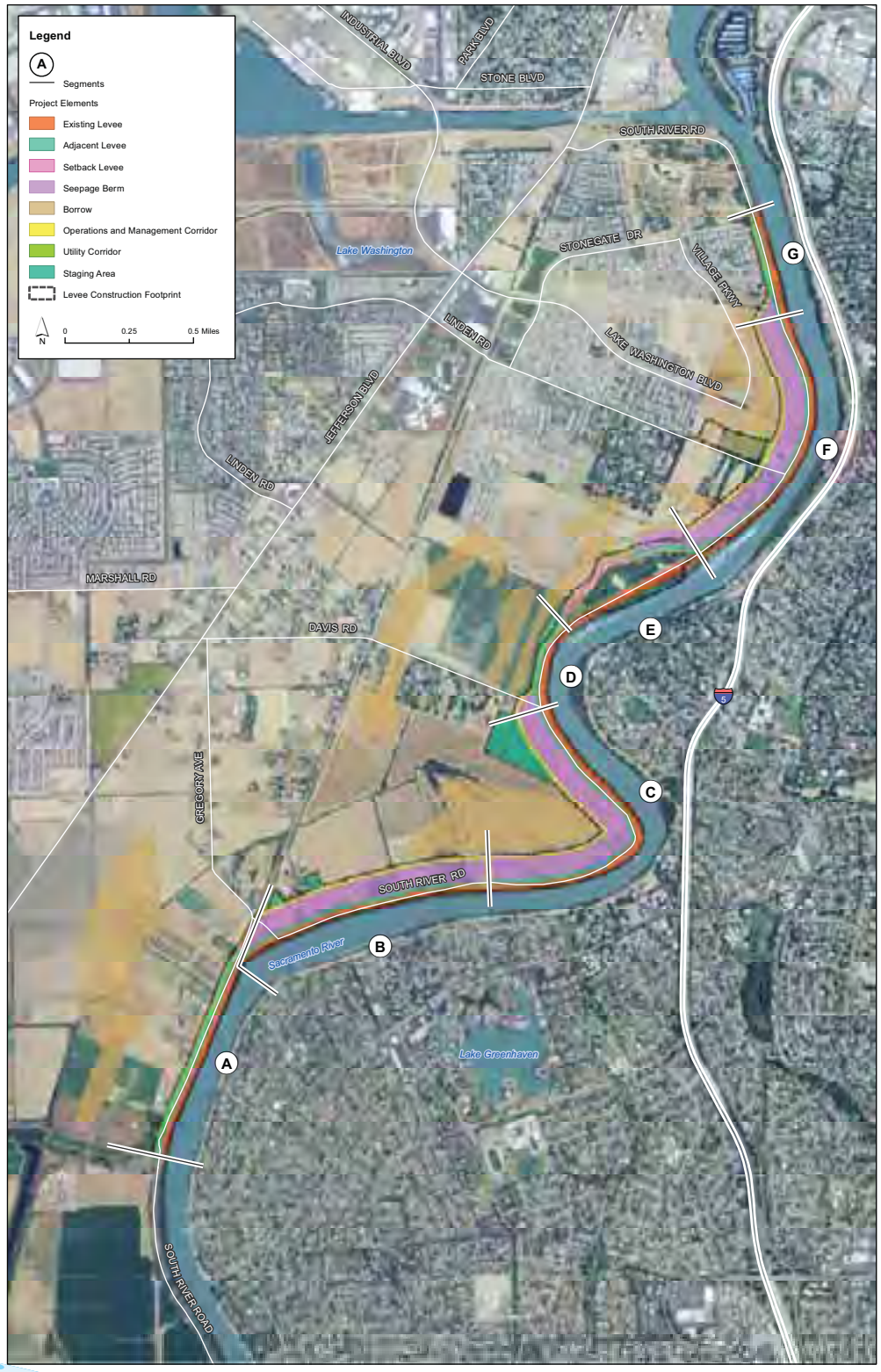


DETAILS

- Rock is typically 8 to 18 inches in diameter, placed in a 12 to 24-inch layer.
- Rock could be covered by soil and/or non-woody vegetation.

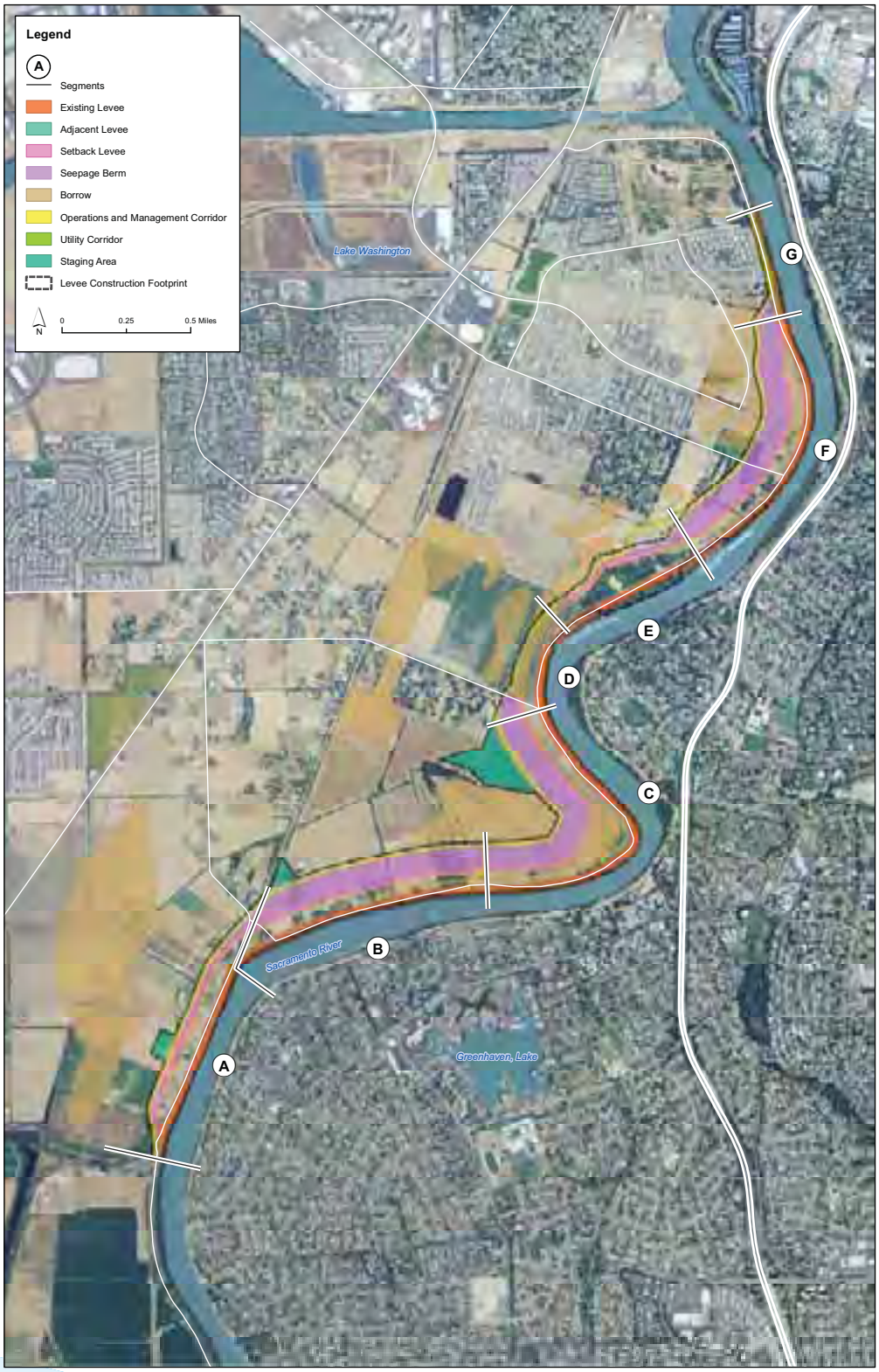
Alternative 1

Alternative 1 involves the construction of adjacent levees, while maintaining South River Road where it presently is, atop the existing levee. An adjacent levee with a cutoff wall is proposed in Segments A, D, E, and G. An adjacent levee with a landside seepage berm is proposed in Segments B, C, and F. Existing vegetation on the levee would be removed within the construction footprint.



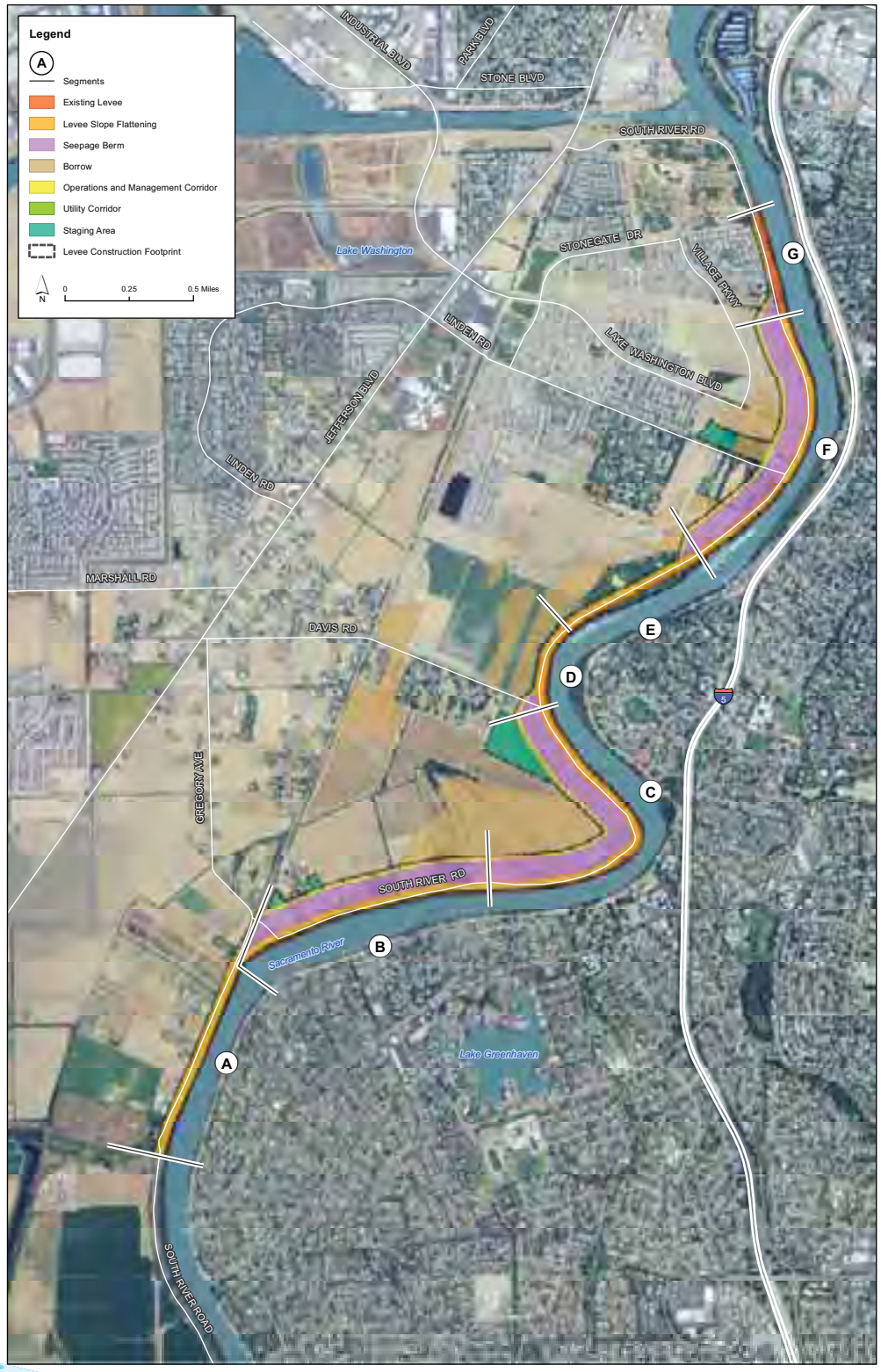
Alternative 2

Alternative 2 involves the construction of setback levees in Segments A–F and breach and degrade of the existing levee for the purpose of historical ecosystem restoration. A setback levee with a cutoff wall is proposed in Segments A, D, and E. A setback levee with a landside seepage berm is proposed in Segments B, C, and F. An adjacent levee with a cutoff wall is proposed for Segment G. South River Road would be relocated landside of the setback levee. Portions of the existing Sacramento River levee would be removed to allow for floodplain inundation.



Alternative 3

Alternative 3 involves the contouring of the Sacramento River levee to alleviate over-steepened banks while maintaining South River Road where it presently is, atop the existing levee. A cutoff wall is proposed in Segments A, D, E, and G. A landside seepage berm is proposed in Segments B, C, and F. Existing vegetation on the levee would be removed within the construction footprint.



About NEPA and CEQA

The National Environmental Policy Act (NEPA) is a Federal law enacted to ensure a proposed activity's potential effects on both the natural and built environments are analyzed and disclosed to the public. Additionally, analysis of the activity's alternatives and development of mitigation measures to reduce effects are required.

This information is presented in an Environmental Impact Statement (EIS). Similarly, the State of California, under the California Environmental Quality Act (CEQA), requires disclosure in an Environmental Impact Report (EIR). These documents disclose the effects of an activity to agencies and the public and can serve as a decision-making aid for governing bodies.

While WSAFCA, a local agency in the state, is proposing the project, the USACE has jurisdiction over the Federal levee WSAFCA is proposing to alter. Therefore, the Southport Sacramento River EIP must comply with both NEPA and CEQA. The efficient way to comply with both laws is to develop a joint EIS/EIR.

A joint EIS/EIR is prepared when there is both Federal and state agency interest in an activity, and/or when a state agency needs permission to perform an action under Federal jurisdiction. The development of the Southport Sacramento River EIP draft joint EIS/EIR is underway and the document is scheduled for release in 2012.

About the Scoping Process

Scoping is a process used to inform the public of a proposed activity. It provides the public an opportunity to comment and share insight and local information related to the range of alternatives being analyzed, the effects of those alternatives, and/or issues of concern related to the proposed activity.

Scoping can be particularly informative in a flood risk-reduction project because the local residents could have knowledge about the performance of a levee that the agencies are unaware of, such as locations of under-seepage or boils or areas of general poor levee performance.

The comments received from public scoping will be used to inform the development of the alternatives; define the environment and resources potentially affected by the alternatives; and analyze the effects resulting from the alternatives. The affected environment broadly includes physical, biological, and social and economic topic areas. Effects of both project construction and long-term operations and maintenance are identified and analyzed.

Potential Environmental Issues

Implementation of the proposed Southport Sacramento River EIP will likely affect both the natural and built environment. The effects will be evaluated and disclosed in the EIS/EIR. Resources analyzed in the EIS/EIR will include, but are not limited to:

- **Aesthetics**
- **Biological resources**
- **Hazards and hazardous materials**
- **Socioeconomics & Environmental justice**
- **Agriculture**
- **Population & housing**
- **Cultural resources**
- **Mineral resources**
- **Hydrology/water quality**
- **Public services**
- **Transportation/traffic**
- **Air quality**
- **Geology & soils**
- **Land use/planning**
- **Recreation**
- **Noise**
- **Utilities/service systems**

Ecosystem Restoration Opportunities & Mitigation

While the highest priority of the Southport Sacramento River EIP is to increase flood protection, the project would also allow WSAFCA to partially or fully mitigate for many of the project's environmental impacts onsite. In addition, it may provide an opportunity for restoration of historical habitat within the project area.

Potential Habitat Restoration Activities

The goal of restoration design is to create self-sustaining, high-value habitats. As part of the Southport Sacramento River EIP, habitat would be created to replace that which may be lost during construction; this minimum level of habitat creation is required under NEPA and CEQA and is considered mitigation. Where space within the project area is available, additional restoration could be undertaken that would restore habitat to historical conditions. Likely objectives for habitat mitigation and restoration include:

- Mitigation for temporary and permanent impacts on protected land cover types
- Mitigation for temporary and permanent impacts to special-status species and potential habitat for these species
- Restoration of portions of the historic Sacramento River floodplain through construction of a setback levee (under Alternative 2)
- Restoration of riparian and oak woodland habitat on the restored floodplain
- Restoration of grasslands on the restored floodplain, setback levee, seepage berm, and other disturbed areas

The amount of onsite habitat mitigation and restoration that could be implemented would depend on the alternative selected. Preliminary design estimates suggest that Alternative 1 and Alternative 3 may not have sufficient project area to fully mitigate for impacts to riparian, wetland and grassland (i.e., Swainson's hawk foraging) habitats, and offsite mitigation could be required.

Alternative 2 may be largely self-mitigating because of its setback levee component, and provide opportunity for additional restoration. The floodplain could be widened considerably and the riparian corridor increased with plantings of native vegetation. Created floodplains under Alternative 2 would provide habitat not only for vegetation, but also for native fish and other species as a result of inundation in the low-lying floodplains.

Recreation Opportunities

Where it is compatible with flood risk-reduction actions and operations, WSAFCA is considering recreation and non-motorized-transport improvements on, adjacent to, or near the levee. While the highest priority of the Southport Sacramento River EIP is to increase flood protection, WSAFCA also is investigating potential recreation corridors that could provide improved or new opportunities for outdoor recreation and healthy, sustainable transport options to destinations such as parks and recreation facilities, schools, community centers, and jobs.

South River Road, which runs along the top of the levee, is the gateway to many recreational settings in the project area. Most of the levee supports a mature riparian forest that is attractive to recreationists. The roadway is presently a rural street with narrow shoulders and no designated bike lane. However, scenic quality and relatively light vehicular traffic make the route a popular bicycling corridor. The road also provides easy access to the Sacramento River bank, making fishing a common and prized recreation activity along the levee. Pedestrians, joggers, and equestrians also use South River Road.

Maintaining and increasing accessibility to these popular settings are two criteria that will be used to measure options for recreation and alternative transportation along the Sacramento River's edge. Potential recreational facilities would be available for walking, jogging, biking, and, where appropriate, equestrian use. Other recreation features may include parking or staging areas, seating, picnic areas, and adventure play areas. These features may be further developed where the recreation corridor forms the edge of a park. Improved access to the river would be evaluated at locations that are compatible with levee maintenance, floodway operations, and ecosystem functions.

Recreation features to be proposed as part of each flood risk–reduction alternative will be defined through the design and environmental processes and will be available for public review and comment when the draft EIS/EIR is released in 2012.

On South River Road, looking east and across the river toward Sacramento's Little Pocket neighborhood. This levee stretch is included in the 6.4 miles proposed for upgrades under the Southport Sacramento River EIP.

Southport Sacramento River Early Implementation Project

Environmental Impact Statement/ Environmental Impact Report

Public Scoping Meeting

U.S. Army Corps of Engineers &
West Sacramento Area Flood Control Agency

September 15, 2011

Welcome and Meeting Purpose

- Chris Elliott, Project Director with ICF International, environmental consultant for the project
- Joint Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) is being prepared per the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA)
- Opportunity to describe the project and EIS/EIR process
- Your comments are invited to inform the environmental analysis

Lead Agencies

- West Sacramento Area Flood Control Agency (WSAFCA)
  - Joint Powers Authority comprised of the City and the reclamation districts that maintain the levees around the City
  - overseeing planning and implementation of levee improvements
  - lead agency under CEQA
- U.S. Army Corps of Engineers (USACE)
  - responsible for approval of modifications to Federal flood project levees and navigable waters under the Rivers and Harbors Act
  - responsible for approval of effects to protected resources under the Clean Water Act
  - lead agency under NEPA

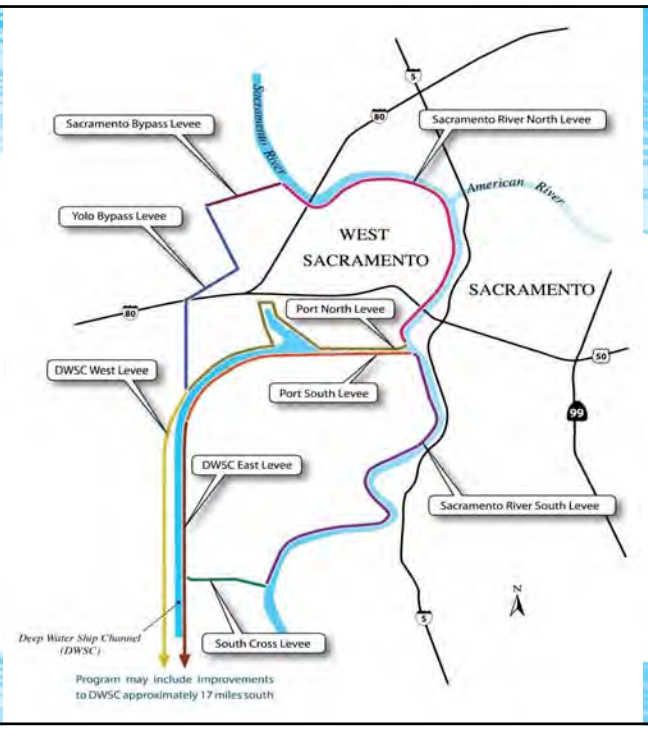
WSAFCA's Overall Goals

- Achieve a minimum of 200-year (an event that has a 0.5% chance of occurring in any given year) level of flood protection in more than 50 miles of City levees protecting the City
- Construct levee improvements as soon and as completely as possible to reduce flood risk
- Provide recreational and ecosystem restoration elements that are compatible with flood improvement actions

About the Southport Sacramento River EIP

- What is an Early Implementation Project (EIP)?
  - Constructed in advance of the State's Central Valley Flood Protection Plan and Federal West Sacramento Project
  - Identified as a critical need site
  - Funded through West Sacramento self-assessment and Prop's 1E and 84 in partnership with State
- EIP details
  - Address deficiencies in a 6.4-mile reach of levee protecting Southport
  - Will treat under- and through-seepage, unstable slopes, and erosion
  - Bring levee up to current Federal and State standards

WSLIP Levee Evaluation Locations



EIP Location

Recent Local Flood Protection Efforts

- 2005: USACE issues new levee design standards.
- 2006: State performs critical erosion repairs on three sites in West Sacramento.
- 2006: WSAFCA and CA DWR begin comprehensive evaluation of levees
- 2007: WSAFCA proposes the West Sacramento Levee Improvements Program (WSLIP).
- 2007: USACE constructs a seepage berm at Davis Road under PL84-99.
- 2008: The I Street Bridge EIP is constructed and The Rivers and CHP Academy EIPs are initiated.

continued…

- 2009/10: WSLIP Draft EIS/EIR is released.
- 2010: USACE begins construction on a setback levee project south of the Barge Canal.
- 2010: WSAFCA and USACE begin planning the Southport Sacramento River EIP.
- 2011: The Rivers and the CHP Academy EIPs complete environmental review and commence construction (in progress).

Flood Risk-Reduction Project Process

- Problem Identification – locating and scoping deficiencies
- Alternatives Analysis – matching potential improvements to address the deficiencies
- Design Development – detailed engineering and preparing plans and specifications
- Environmental Documentation – evaluating possible environmental effects from the potential risk-reduction measures
- Permitting
- Construction

Identified Levee Deficiencies

- Unstable slopes caused by inadequate levee geometry and/or deficient levee material
- Seepage (under or through the levee)
- Erosion
- Non-compliant vegetation

Possible Flood Risk-Reduction Measures

The design and environmental analysis process will analyze the impacts and feasibility of several combinations of the following measures:

- Slurry cut-off walls through the levee
- Slope flattening of the existing levee
- Setback levee landside of the existing levee
- Adjacent levee landside of the existing levee
- Seepage berms/stability berms on the landside of the levee
- Rock slope protection on the waterside of the levee
- Relief wells

Multi-Objective Benefits

- Recreation
  - Corridors for walking, jogging, biking, and, where appropriate, equestrian use
  - Other recreation features may include landscaping, benches, small picnic areas, and small play areas
- Open Space and Habitat
  - Restored areas to mitigate project effects
  - Enhancement of fish and aquatic habitat along the river's edge and wetland and upland areas on and near levees
  - Potential for areas for floodplain expansion and restoration

Environmental Documentation Process

- Solicit public input to be considered in conducting the environmental analysis
- Prepare EIS/EIR
- Circulate draft EIS/EIR for public review and comment
- Review and respond to comments and prepare final EIS/EIR
- WSAFCA adopts project and findings of fact, certifies EIR, adopts mitigation and monitoring plan, and records Notice of Determination
- USACE prepares Record of Decision

Scoping

- Project goals and objectives have been identified based on flood management deficiencies
- Measures have been identified to address those deficiencies
- Measures have been combined to comprise complete alternatives to provide the spatial context for discussing the types and extents of potential environmental and community effects
- Alternatives will continue to evolve and will be formulated for analysis in a Public Draft EIS/EIR
- Your input is desired and will be considered on the measures, alternatives, and potential effects analyzed in the EIS/EIR

Environmental Resource Issues

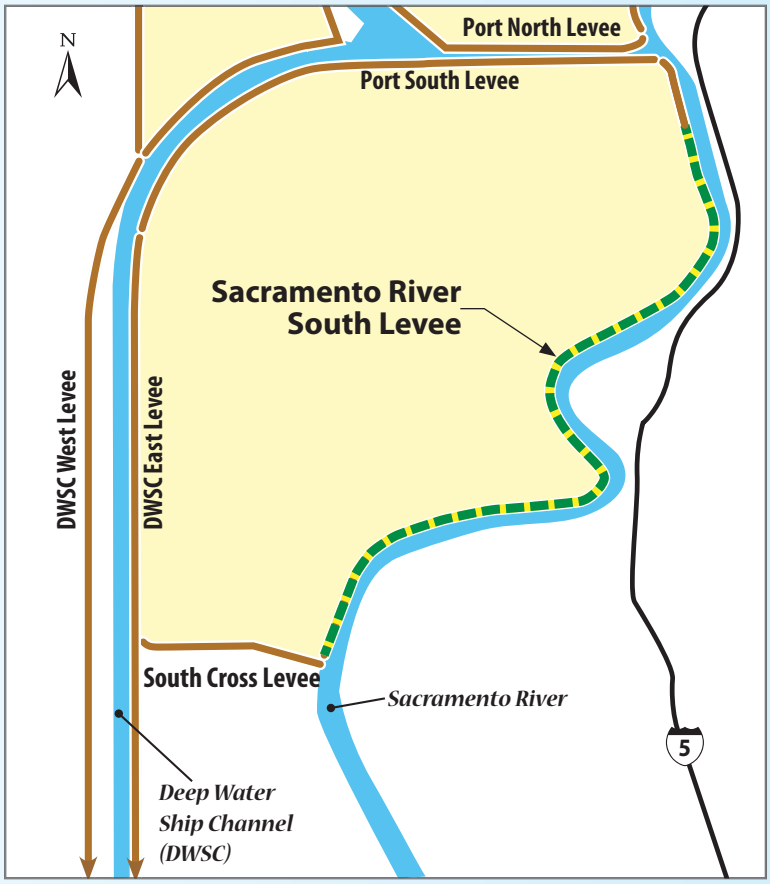
- **Aesthetics**
- **Air quality**
- **Geology and soils**
- **Land use/planning**
- **Recreation**
- **Noise**
- **Utilities/public services**
- **Biological resources**
- **Hazardous materials**
- **Socioeconomics/Environmental justice**
- **Cultural resources**
- **Agriculture**
- **Population and housing**
- **Public services**
- **Mineral resources**
- **Transportation/Navigation**
- **Growth-inducement**
- **Cumulative effects**

Next Steps

- Ask questions of project team members at this meeting
- Provide written comments via mailed comment card or e-mail by September 26, 2011
- Look for the draft environmental document to be released in mid-2012

The Southport Sacramento River Early Implementation Project

About the Project. The West Sacramento Area Flood Control Agency (WSAFCA) is proposing the Southport Sacramento River Early Implementation Project (EIP) to implement flood risk–reduction measures along the Sacramento River South Levee that protects the Southport community. WSAFCA is proposing the measures be implemented along 6 miles of the levee that runs along the west bank of the Sacramento River from the Barge Canal to the South Cross Levee. The EIP study area also encompasses potential soil borrow sites east and west of southern Jefferson Blvd. WSAFCA's ultimate goal is to protect the lives and property of West Sacramento's residents, employees, and visitors.



An EIP is a levee site that has been identified as having significant deficiencies. Therefore the planning, environmental, and construction processes are implemented in advance of the overall West Sacramento Levee Improvements Program (WSLIP). The WSLIP is a city-wide comprehensive flood risk-reduction program initiated in 2007. WSAFCA has selected three other EIP sites (the CHP Academy, the Rivers, and the I Street Bridge) for construction in advance of WSLIP in the past 3 years.

Construction of the Southport Sacramento River EIP would bring the levee up to standard with Federal and state flood protection criteria and improve the under- and through-seepage, erosion, and slope instability that currently hinder the levee's performance. The EIP also would provide opportunities for ecosystem restoration and public recreation.

The Environmental Process. To comply with the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA), a joint environmental impact statement (EIS)/ environmental impact report (EIR) is being developed. This document will explain the proposed EIP alternatives, and effects and mitigation measures if the EIP is constructed. Potential impacts on resources—including aesthetics, soils, flood control, wildlife, vegetation, noise, recreation, and traffic—will be evaluated in the EIS/EIR.

To comply with NEPA, the U.S. Army Corps of Engineers (USACE) will act as the Federal lead agency, and WSAFCA will act as lead agency under CEQA. While WSAFCA is proposing the EIP, alterations to Federal levees cannot be made without approval from USACE.

over

EIP Alternatives. Three alternatives are being proposed. The priority of each alternative is to increase flood protection, but each also provides varying opportunities for ecosystem restoration and recreation opportunities. The alternatives are each a combination of two or more of the following flood risk–reduction measures:

- Levee slope flattening
- Setback levee and/or adjacent levee
- Relief wells
- Seepage berms/stability berms on the land side of the levee
- Rock slope protection on the water side
- Slurry cut-off walls

EIP Schedule. The EIP is currently in the environmental and alternatives design phase. Specialists have already gone out into the field, inspected the levee, and identified the levee's deficiencies. Engineers have proposed three preliminary alternatives. The design and construction teams will work collaboratively to determine the feasibility of the alternatives, ensuring they provide a level of flood protection that meets current standards, are cost effective, and limit the short- and long-term impacts on the environment. Construction is scheduled to begin in 2013.

Selecting an Alternative. The public will have an opportunity to weigh in on the proposed alternatives during the scoping phase (August 26–September 26, 2011), and to suggest new alternatives to be considered in the Public Draft EIS/EIR. Following scoping, WSAFCA will select the alternatives that will be analyzed in the Public Draft EIS/EIR, available for public review in spring 2012.

For More Information. For more information about public input opportunities, the environmental process, and other flood risk–reduction projects in the city, visit *www.cityofwestsacramento.org/city/flood*.

We Want Your Input. If you would like to comment on the content of the EIS/EIR being developed for the Southport Sacramento River EIP, please submit comments to the contacts below. All comments must be received by 5 p.m. on September 26, 2011.

Megan Smith, Project Manager
ICF International
630 K Street, Suite 400
Sacramento, CA 95814
southportcomments@icfi.com

or

Mr. John Suazo
U.S. Army Corps of Engineers, Sacramento District
Attn: Planning Division (CESPK-PD-R)
1325 J Street, Sacramento, CA 95814
john.suazo@usace.army.mil

US Army Corps of Engineers Sacramento District

WSAFCA
West Sacramento Area Flood Control Agency

The Southport Sacramento River Early Implementation Project

Comment Card

Name:_____ Date:_____

Telephone: _____Email:_____

Affiliation: _____Title (if applicable):_____

Street Address:_____

City:_____ State:_____ Zip:_____

Thank you for your interest in this flood risk-reduction effort. The West Sacramento Area Flood Control Agency, and the U.S. Army Corps of Engineers value your input regarding this Early Implementation Project. Please provide us with your comments regarding the scope of the Environmental Impact Statement/ Environmental Impact Report being prepared for this project. Please write legibly.

For your convenience, feel free to take this card with you, fill it out at your opportunity, and mail it. You may also send comments by email to *southportcomments@icfi.com*. ***All comments must be postmarked by September 26, 2011***. Thank you for your interest in the Southport Sacramento River EIP.

PLEASE FOLD ALONG THIS LINE FOR MAILING

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

PLACE
POSTAGE
HERE

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

Appendix C
Comments Received

Appendix C contains all written comments received during the scoping period.

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Commenter	Address	Organization Type	Date Received	Comment Letter Number
Scott Morgan, Office of Planning and Research	1400 10th St. P.O. Box 3044 Sacramento CA, 95812-3044	State	8/26/11	1
James Herota, Central Valley Flood Protection Board	3310 El Camino Ave Room 151, Sacramento, CA 95821	State	9/1/11	2
Gregor Blackburn, FEMA Region IX	1111 Broadway, Suite 1200, Oakland, CA 94607	Federal	8/31/11	3
Katy Sanchez, Native American Heritage Commission	915 Capitol Mall, Room 364, Sacramento, CA 95814	State	8/30/11	4
Genevieve Sparks, Central Valley Regional Water Quality Control Board	11020 Sun Center Drive #200, Rancho Cordova, CA 95670-6114	State	9/12/11	5
Judy Ueda	*Not provided.*	Individual	9/14/11	6
Karen Kubo	559 Watercolor Lane, West Sacramento, CA 95605	Individual	9/16/11	7
Diane McCray	2590 South River Road, West Sacramento, CA 95691	Individual/ Business	9/20/11	8
Jim Colgan	2310 Cable Court, West Sacramento, CA 95691	Individual	9/20/11	9
Steve and Pam Gould	4395 Gregory Avenue, West Sacramento, CA	Individual	9/20/11	10
Robert Hughes	3079 Apache Street, West Sacramento, CA 95691	Individual	8/29/11	11
Sister Michael		Individual	9/16/11	12
David Gully	1818 Trinity Way, West Sacramento, CA 95691	Individual	9/21/11	13
Thamarah Rodgers Lacomb	4444 S River Rd, West Sacramento, CA 95691	Individual	9/26/11	14
Laurie C. Nelson	Embarcadero Realty Services LP, 1750 Creekside Oaks Drive, Suite 215, Fair Oaks, CA 95833	Individual	9/25/11	15
Richard D. Sestero	Seeno Construction Company, 4021 Port Chicago Highway, Concord, CA 94520	Individual	9/19/11	16
Phil Hogan, USDA Natural Resources Conservation Service	221 West Court Street, Suite 1, Woodland, CA 95695	Federal	8/25/11	17

Commenter	Address	Organization Type	Date Received	Comment Letter Number
Stephan Daues	2981 Rubicon Way, West Sacramento CA	Individual	8/26/11	18
Mark Zollo		Individual	9/19/11	19
John Rivett	2527 La Jolla Street, West Sacramento, CA 95691	Individual	9/18/11	20
Tony Sauer	*Not provided.*	Individual	8/26/11	21
Michael Machado, Delta Protection Commission	14215 River Road, P.O. Box 530, Walnut Grove, CA 95690	State	9/22/11	22
Christopher Lacomb	4444 South River Road, West Sacramento, CA 95691	Individual	9/20/11	23
Deeden Kimbrough	1305 Linden Road, West Sacramento, CA 95691	Individual	9/22/11	24
Bret Culbreth	4400 South River Road, West Sacramento, CA 95691	Individual	9/15/11	25
Kevin Winter	8971 Silverberry Avenue, Elk Grove, CA 95624	Individual	9/15/11	26
Rebecca Wall	2970 Bevan Road, West Sacramento, CA 95691	Individual	9/13/11	27
Terry Annesley	4400 South River Road, West Sacramento, CA 95691	Individual	9/15/11	28
Albert W. Rodgers	4440 South River Road, West Sacramento, CA 95691	Individual	9/26/11	29
Southport Homeowners (17 Residences)	Multiple addresses (See letter)	Group of Individuals	9/26/11	30
David Bennis	*Not provided.*	Individual	9/26/11	31
Kelly Magreevy	*Not provided.*	Individual	9/27/11	32
Eric Fredericks, Caltrans Dist 3	*Not provided.*	State	9/26/11	33
Kelly Catlett for Defenders of Wildlife and Ronald Stork for Friends of the River	*Not provided.*	NGO	9/26/11	34
Group of Homeowners (6 Residences)	Multiple addresses (See letter)	Group of Individuals	9/26/11	35

Commenter	Address	Organization Type	Date Received	Comment Letter Number
Philip Carson	*Not provided.*	Individual	9/26/11	36
Tom Kelly, EPA Environmental Review Office	Environmental Review Office (CED-2), U.S. EPA 75 Hawthorne Street, San Francisco, CA 94105	Federal	9/27/11	37
Michael Smith	*Not provided.*	Business	9/26/11	38
Pamela Gould	*Not provided.*	Individual	9/26/11	39
Eric Fredericks, Caltrans Dist.3	2379 Gateway Oaks Drive, Suite 150, Sacramento, CA 95833	State	9/28/11	40
Cy R. Oggins, State Lands Commission	100 Howe Avenue, Suite 100-South, Sacramento, CA 95825-8202	State	9/26/11	41
Kim McDonald	4390 South River Road, West Sacramento, CA 95691	Individual	9/23/11	42
Joyce Belli	2666 Meadowlark Circle., West Sacramento, CA 95691	Individual	9/22/11	43
Joel F MaCray, Jr.	2590 South River Road, West Sacramento, CA	Individual/ Business	9/23/11	44
Dawn Caldwell	1502 Maryland Avenue, West Sacramento, CA 95691	Individual	9/22/11	45
Jordan Lang, Sacramento Bike Advocates	909 12th Street, Suite 116, Sacramento, CA 95814	NGO	9/8/11	46
Matthew Jones, Yolo-Solano Air Quality Management District	1947 Galileo Court, Suite 103, Davis, CA 95618	County	10/4/11	47

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Edmund G. Brown Jr.
Governor

Ken Alex
Director

Notice of Preparation

August 24, 2011

To: Reviewing Agencies

Re: Southport Sacramento River Early Implementation Project
SCH# 2011082069

Attached for your review and comment is the Notice of Preparation (NOP) for the Southport Sacramento River Early Implementation Project draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Megan Smith ICF International
I/C of West Sacramento Area Flood Control Agency
630 K Street, Suite 400
Sacramento, CA 95814

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Attachments
cc: Lead Agency

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2011082069
Project Title Southport Sacramento River Early Implementation Project
Lead Agency West Sacramento Area Flood Control Agency

Type NOP Notice of Preparation

Description Note: Review per lead

The project would bring the levee up to standard with Federal and state flood protection criteria, as well as provide opportunities for ecosystem restoration and public recreation. The U.S. Army Corps of Engineers (USACE) will act as the Federal lead agency under the National Environmental Policy Act (NEPA). WSAFCA will act as lead agency under the California Environmental Quality Act (CEQA).

The flood protection measures considered in the EIS/EIR may include:
- Slope flattening of the existing levee,
- Use of seepage berms and/or stability berms located to the land side of the levee,
- Rock slope protection located to the water side of the levee
- Setback levees and/or adjacent levees located landward of the existing levee,
- Relief wells, and
- Slurry cut-off walls.

Lead Agency Contact

Name Megan Smith ICF International
Agency I/C of West Sacramento Area Flood Control Agency
Phone (916) 617-4645 **Fax**
email southportcomments@icfi.com
Address 630 K Street, Suite 400
City Sacramento **State** CA **Zip** 95814

Project Location

County Yolo
City
Region
Cross Streets Jefferson Blvd.
Lat / Long
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways
Airports
Railways
Waterways
Schools
Land Use

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Geologic/Seismic; Toxic/Hazardous; Water Quality; Landuse; Other Issues; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Social; Traffic/Circulation

---

Reviewing Agencies Resources Agency; Department of Boating and Waterways; Department of Conservation; Central Valley Flood Protection Board; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Game, Region 2; Delta Protection Commission; Native American Heritage Commission; State Lands Commission; California Highway Patrol; Caltrans, District 3; Department of Toxic Substances Control; Regional Water Quality Control Bd., Region 5 (Sacramento)

Note: Blanks in data fields result from insufficient information provided by lead agency.

Date Received 08/24/2011 *Start of Review* 08/24/2011 *End of Review* 09/26/2011

Note: Blanks in data fields result from insufficient information provided by lead agency.

NOP Distribution List

County: Yolo SCH# 2011062009

Resources Agency

- [x] **Resources Agency**
  Nadell Gayou
- [x] **Dept. of Boating & Waterways**
  Mike Sotelo
- [ ] **California Coastal Commission**
  Elizabeth A. Fuchs
- [ ] **Colorado River Board**
  Gerald R. Zimmerman
- [x] **Dept. of Conservation**
  Jonathan Martis
- [ ] **California Energy Commission**
  Eric Knight
- [ ] **Cal Fire**
  Allen Robertson
- [x] **Central Valley Flood Protection Board**
  James Herota
- [ ] **Office of Historic Preservation**
  Ron Parsons
- [x] **Dept of Parks & Recreation**
  Environmental Stewardship Section
- [ ] **California Department of Resources, Recycling & Recovery**
  Sue O'Leary
- [ ] **S.F. Bay Conservation & Dev't. Comm.**
  Steve McAdam
- [x] **Dept. of Water Resources**
  Resources Agency
  Nadell Gayou
- [ ] _____
  Conservancy

Fish and Game

- [ ] **Depart. of Fish & Game**
  Scott Flint
  Environmental Services Division
- [ ] **Fish & Game Region 1**
  Donald Koch
- [ ] **Fish & Game Region 1E**
  Laurie Harnsberger
- [x] **Fish & Game Region 2**
  Jeff Drongesen
- [ ] **Fish & Game Region 3**
  Charles Armor
- [ ] **Fish & Game Region 4**
  Julie Vance
- [ ] **Fish & Game Region 5**
  Leslie Newton-Reed
  Habitat Conservation Program
- [ ] **Fish & Game Region 6**
  Gabrina Gatchel
  Habitat Conservation Program
- [ ] **Fish & Game Region 6 I/M**
  Brad Henderson
  Inyo/Mono, Habitat Conservation Program
- [ ] **Dept. of Fish & Game M**
  George Isaac
  Marine Region

Other Departments

- [ ] **Food & Agriculture**
  Steve Shaffer
  Dept. of Food and Agriculture
- [ ] **Depart. of General Services**
  Public School Construction
- [ ] **Dept. of General Services**
  Anna Garbeff
  Environmental Services Section
- [ ] **Dept. of Public Health**
  Bridgette Binning
  Dept. of Health/Drinking Water

Independent Commissions,Boards

- [x] **Delta Protection Commission**
  Linda Flack
- [ ] **Cal EMA (Emergency Management Agency)**
  Dennis Castrillo
- [ ] **Governor's Office of Planning & Research**
  State Clearinghouse
- [x] **Native American Heritage Comm.**
  Debbie Treadway
- [ ] **Public Utilities Commission**
  Leo Wong
- [ ] **Santa Monica Bay Restoration**
  Guangyu Wang
- [x] **State Lands Commission**
  Cy R. Oggins
- [ ] **Tahoe Regional Planning Agency (TRPA)**
  Cherry Jacques

Business, Trans & Housing

- [ ] **Caltrans - Division of Aeronautics**
  Philip Crimmins
- [ ] **Caltrans - Planning**
  Terri Pencovic
- [x] **California Highway Patrol**
  Bob Nannini
  Office of Special Projects
- [ ] **Housing & Community Development**
  CEQA Coordinator
  Housing Policy Division

Dept. of Transportation

- [ ] **Caltrans, District 1**
  Rex Jackman
- [ ] **Caltrans, District 2**
  Marcelino Gonzalez
- [x] **Caltrans, District 3**
  Bruce de Terra
- [ ] **Caltrans, District 4**
  Lisa Carboni
- [ ] **Caltrans, District 5**
  David Murray
- [ ] **Caltrans, District 6**
  Michael Navarro
- [ ] **Caltrans, District 7**
  Elmer Alvarez
- [ ] **Caltrans, District 8**
  Dan Kopulsky
- [ ] **Caltrans, District 9**
  Gayle Rosander
- [ ] **Caltrans, District 10**
  Tom Dumas
- [ ] **Caltrans, District 11**
  Jacob Armstrong
- [ ] **Caltrans, District 12**
  Marlon Regisford

Cal EPA

Air Resources Board

- [ ] Airport Projects
  Jim Lerner
  - [ ] Transportation Projects
    Douglas Ito
  - [ ] Industrial Projects
    Mike Tollstrup
- [ ] **State Water Resources Control Board**
  Regional Programs Unit
  Division of Financial Assistance
- [ ] **State Water Resources Control Board**
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- [ ] **State Water Resouces Control Board**
  Phil Crader
  Division of Water Rights
- [x] **Dept. of Toxic Substances Control**
  CEQA Tracking Center
- [ ] **Department of Pesticide Regulation**
  CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

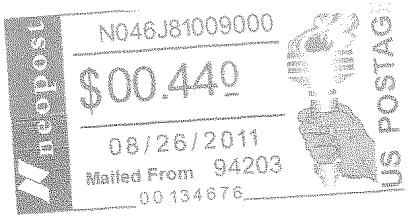
- [ ] **RWQCB 1**
  Cathleen Hudson
  North Coast Region (1)
- [ ] **RWQCB 2**
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- [ ] **RWQCB 3**
  Central Coast Region (3)
- [ ] **RWQCB 4**
  Teresa Rodgers
  Los Angeles Region (4)
- [x] **RWQCB 5S**
  Central Valley Region (5)
  - [ ] **RWQCB 5F**
    Central Valley Region (5)
    Fresno Branch Office
  - [ ] **RWQCB 5R**
    Central Valley Region (5)
    Redding Branch Office
- [ ] **RWQCB 6**
  Lahontan Region (6)
  - [ ] **RWQCB 6V**
    Lahontan Region (6)
    Victorville Branch Office
- [ ] **RWQCB 7**
  Colorado River Basin Region (7)
- [ ] **RWQCB 8**
  Santa Ana Region (8)
- [ ] **RWQCB 9**
  San Diego Region (9)

- [ ] **Other** _____

Last Updated 8/23/11

State of California

GOVERNOR'S OFFICE OF PLANNING AND RESEARCH
STATE CLEARINGHOUSE
P.O. BOX 3044
SACRAMENTO, CALIFORNIA 95812-3044



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STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY EDMUND G. BROWN JR., GOVERNOR

CENTRAL VALLEY FLOOD PROTECTION BOARD
3310 El Camino Ave., Rm. 151
SACRAMENTO, CA 95821
(916) 574-0609 FAX: (916) 574-0682
PERMITS: (916) 574-2380 FAX: (916) 574-0682

August 30, 2011

Megan Smith
ICF International
I/C of West Sacramento Area Flood Control Agency
630 K Street, Suite 400
Sacramento, California, 95814

Subject: Response to the Notice of Preparation for the Southport Sacramento River Early Implementation Project Draft Environmental Impact Report (SCH# 2011082069)

Dear Ms. Smith:

Staff of the Central Valley Flood Protection Board has reviewed the subject document and provides the following comments:

The proposed project is located within the jurisdiction of the Central Valley Flood Protection Board. The Board is required to enforce standards for the construction, maintenance and protection of adopted flood control plans that will protect public lands from floods. The jurisdiction of the Board includes the Central Valley, including all tributaries and distributaries of the Sacramento River and the San Joaquin River, and designated floodways (Title 23 California Code of Regulations (CCR), Section 2).

A Board permit is required prior to starting the work within the Board's jurisdiction for the following:

- The placement, construction, reconstruction, removal, or abandonment of any landscaping, culvert, bridge, conduit, fence, projection, fill, embankment, building, structure, obstruction, encroachment, excavation, the planting, or removal of vegetation, and any repair or maintenance that involves cutting into the levee (CCR Section 6);

- Existing structures that predate permitting or where it is necessary to establish the conditions normally imposed by permitting. The circumstances include those where responsibility for the encroachment has not been clearly established or ownership and use have been revised (CCR Section 6);

- Vegetation plantings will require the submission of detailed design drawings; identification of vegetation type; plant and tree names (i.e. common name and scientific name); total number of each type of plant and tree; planting spacing and irrigation method that will be utilized within the project area; a complete vegetative management plan for maintenance to prevent the interference with flood control, levee maintenance, inspection and flood fight procedures (CCR Section 131).

If you have any questions, please contact me at (916) 574-0651, or via email at jherota@water.ca.gov.

Sincerely,

James Herota
Staff Environmental Scientist
Flood Projects Improvement Branch

cc: Governor's Office of Planning and Research
State Clearinghouse
1400 Tenth Street, Room 121
Sacramento, CA 95814

STATE OF CALIFORNIA
CALIFORNIA NATURAL RESOURCES AGENCY
CENTRAL VALLEY FLOOD PROTECTION BOARD
3310 EL CAMINO AVENUE, ROOM 151
SACRAMENTO, CA 95821

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Megan Smith
ICF International
I/C of West Sacramento Area Flood Control Agency
630 K Street, Suite 400
Sacramento, California 95814

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3

U.S. Department of Homeland Security
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA. 94607-4052

FEMA

August 29, 2011

Megan Smith, Project Manager
ICF International
630 K Street, Suite 400
Sacramento, California 95814

Dear Ms. Smith:

This is in response to your request for comments on the Notice of Preparation of an Environmental Impact Statement/Environmental Impact Report for the Southport Sacramento River Early Implementation Project.

Please review the current effective Flood Insurance Rate Maps (FIRMs) for the City of West Sacramento (Community Number 060728), Maps dated January 19, 1995; and County of Yolo (Community Number 060423), Maps dated June 18, 2010. Please note that the City of West Sacramento, Yolo County, California is a participant in the National Flood Insurance Program (NFIP). The minimum, basic NFIP floodplain management building requirements are described in Vol. 44 Code of Federal Regulations (44 CFR), Sections 59 through 65.

A summary of these NFIP floodplain management building requirements are as follows:

- All buildings constructed within a riverine floodplain, (i.e., Flood Zones A, AO, AH, AE, and A1 through A30 as delineated on the FIRM), must be elevated so that the lowest floor is at or above the Base Flood Elevation level in accordance with the effective Flood Insurance Rate Map.

- If the area of construction is located within a Regulatory Floodway as delineated on the FIRM, any ***development*** must not increase base flood elevation levels. **The term *development* means any man-made change to improved or unimproved real estate, including but not limited to buildings, other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials.** A hydrologic and hydraulic analysis must be performed *prior* to the start of development, and must demonstrate that the development would not cause any rise in base flood levels. No rise is permitted within regulatory floodways.

- Upon completion of any development that changes existing Special Flood Hazard Areas, the NFIP directs all participating communities to submit the appropriate hydrologic and hydraulic data to FEMA for a FIRM revision. In accordance with 44 CFR, Section 65.3, as soon as practicable, but not later than six months after such data becomes available, a community shall notify FEMA of the changes by submitting technical data for a flood map revision. To obtain copies of FEMA's Flood Map Revision Application Packages, please refer to the FEMA website at http://www.fema.gov/business/nfip/forms.shtm.

Please Note:

Many NFIP participating communities have adopted floodplain management building requirements which are more restrictive than the minimum federal standards described in 44 CFR. Please contact the local community's floodplain manager for more information on local floodplain management building requirements. The West Sacramento floodplain manager can be reached by calling Stephen Patek, Community Development Director, at (916) 373-5854. The Yolo County floodplain manager can be reached by calling Lonell Butler, Building Official, at (530) 666-8803.

If you have any questions or concerns, please do not hesitate to call Robert Durrin of the Mitigation staff at (510) 627-7057.

Sincerely,

for Ray Lindsay

Gregor Blackburn, CFM, Branch Chief
Floodplain Management and Insurance Branch

cc:
John Suazo, U. S. Army Corps of Engineers, Sacramento District
Stephen Patek, Community Development Director, City of West Sacramento
Lonell Butler, Building Official, Yolo County
Ray Lee, WREA, State of California, Department of Water Resources, North Central Region Office
Robert Durrin, Floodplanner, CFM, DHS/FEMA Region IX
Alessandro Amaglio, Environmental Officer, DHS/FEMA Region IX

U.S. Department of Homeland Security
Region IX
1111 Broadway, Suite 1200
Oakland, CA 94607-4052

FEMA

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Megan Smith, Project Manager
ICF International
630 K Street, Suite 400
Sacramento, California 95814

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4

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
(916) 657-5390 - Fax

August 30, 2011

Megan Smith ICF International
I/C of West Sacramento Area Flood Control Agency
630 K Street, Suite 400
Sacramento, CA 95814

RE: SCH# 2011082069 Southport Sacramento River Early Implementation Project; Yolo County.

Dear Ms. Smith:

The Native American Heritage Commission (NAHC) has reviewed the Notice of Preparation (NOP) referenced above. The California Environmental Quality Act (CEQA) states that any project that causes a substantial adverse change in the significance of an historical resource, which includes archeological resources, is a significant effect requiring the preparation of an EIR (CEQA Guidelines 15064(b)). To comply with this provision the lead agency is required to assess whether the project will have an adverse impact on historical resources within the area of project effect (APE), and if so to mitigate that effect. To adequately assess and mitigate project-related impacts to archaeological resources, the NAHC recommends the following actions:

- ✓ Contact the appropriate regional archaeological Information Center for a record search. The record search will determine:
  - If a part or all of the area of project effect (APE) has been previously surveyed for cultural resources.
  - If any known cultural resources have already been recorded on or adjacent to the APE.
  - If the probability is low, moderate, or high that cultural resources are located in the APE.
  - If a survey is required to determine whether previously unrecorded cultural resources are present.
- ✓ If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
  - The final report containing site forms, site significance, and mitigation measurers should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure.
  - The final written report should be submitted within 3 months after work has been completed to the appropriate regional archaeological Information Center.
- ✓ Contact the Native American Heritage Commission for:
  - A Sacred Lands File Check. . **USGS 7.5 minute quadrangle name, township, range and section required.**
  - A list of appropriate Native American contacts for consultation concerning the project site and to assist in the mitigation measures. **Native American Contacts List attached.**
- ✓ Lack of surface evidence of archeological resources does not preclude their subsurface existence.
  - Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, per California Environmental Quality Act (CEQA) §15064.5(f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.
  - Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans.
  - Lead agencies should include provisions for discovery of Native American human remains in their mitigation plan. Health and Safety Code §7050.5, CEQA §15064.5(e), and Public Resources Code §5097.98 mandates the process to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

Sincerely,

Katy Sanchez

Katy Sanchez
Program Analyst
(916) 653-4040

cc: State Clearinghouse

Native American Contact List
Yolo County
August 30, 2011

4

Wintun Environmental Protection Agency
Dave Jones
P.O. Box 1839 Wintun (Patwin)
Williams , CA 95987
corwepa@hotmail.com
(530) 473-3318
(530) 473-3319
(530) 473-3320 - Fax

Kesner Flores
PO Box 1047 Wintun / Patwin
Wheatland , CA 95692
calnagpra@hotmail.com
925-586-8919

Yocha Dehe Wintun Nation
Marshall McKay, Chairperson
P.O. Box 18 Wintun (Patwin)
Brooks , CA 95606
(530) 796-3400
(530) 796-2143 Fax

Yocha Dehe Wintun Nation
Leland Kinter, Native Cultural Renewal Committee
P.O. Box 18 Wintun (Patwin)
Brooks , CA 95606
lkinter@yochadehe-nsn.gov
(530) 979-6346
(530) 796-3400 - office
(530) 796-2143 Fax

Cortina Band of Indians
Charlie Wright, Chairperson
PO Box 1630 Wintun / Patwin
Williams , CA 95987
(530) 473-3274 - Voice
(530) 473-3190 - Voice
(530) 473-3301 - Fax

Yocha Dehe Wintun Nation
Cynthia Clarke, Native Cultural Renewal
P.O. Box 18 Wintun (Patwin)
Brooks , CA 95606
(530) 796-3400 - office
(530) 796-2143 Fax

Cortina Band of Indians
Thelma Brafford, Tribal Administrator
P.O. Box 1630 Wintun/Patwin
Williams , CA 95987
rezdog37@yahoo.com
(530) 473-3274
(530) 437-3301 FAX

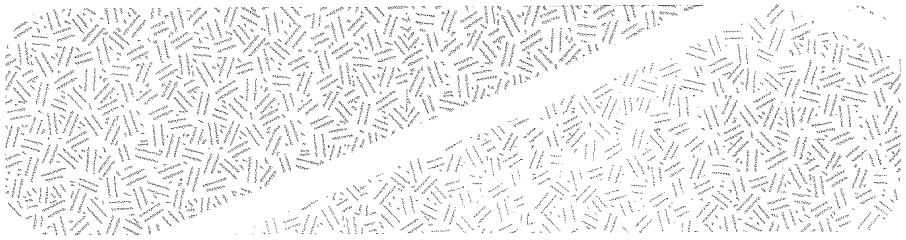
Yocha Dehe Wintun Nation
Reno Franklin, Cultural Resources Director
P.O. Box 18 Wintun (Patwin)
Brooks , CA 95606
rfranklin@yochadehe-nsn.
(530) 979-6346
(530) 796-3400 - office
(530) 796-2143 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed SCH# 2011082069 Southport Sacramento River Early Implementaion Project; Yolo County.

State of California
Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, CA 95814



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California Regional Water Quality Control Board
Central Valley Region
Katherine Hart, Chair

11020 Sun Center Drive, #200, Rancho Cordova, California 95670-6114
(916) 464-3291 • FAX (916) 464-4645
http://www.waterboards.ca.gov/centralvalley

Matthew Rodriquez
Secretary for Environmental Protection

Edmund G. Brown Jr.
Governor

9 September 2011

Megan Smith, Project Manager
ICF International
630 K Street, Suite 400
Sacramento, CA 95814

CERTIFIED MAIL
7010 3090 0000 5045 4945

COMMENTS TO THE NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT/ ENVIRONMENTAL IMPACT REPORT, SOUTHPORT SACRAMENTO RIVER EARLY IMPLEMENTATION PROJECT, YOLO COUNTY

Pursuant to the West Sacramento Area Flood Control Agency's 26 August 2011 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Notice of Preparation of an Environmental Impact Statement/Environmental Impact Report* for the Southport Sacramento River Early Implementation Project, located in Yolo County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

Construction Storm Water General Permit

Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities (Construction General Permit), Construction General Permit Order No. 2009-009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

For more information on the Construction General Permit, visit the State Water Resources Control Board website at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits[1]

The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process.

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/

Industrial Storm Water General Permit

Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 97-03-DWQ.

For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml.

Clean Water Act Section 404 Permit

If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed for the United States Army Corps of Engineers (USACOE). If a Section 404 permit is required by the USACOE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements.

If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACOE at (916)557-5250.

Clean Water Act Section 401 Permit – Water Quality Certification

If an USACOE permit, or any other federal permit, is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. Water Quality Certification must be obtained prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications.

[1] Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

Waste Discharge Requirements

If USACOE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project will require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation.

For more information on the Water Quality Certification and WDR processes, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_certification/

If you have questions regarding these comments, please contact me at (916) 464-4745 or gsparks@waterboards.ca.gov.

Genevieve Sparks

Genevieve (Gen) Sparks
Environmental Scientist
401 Water Quality Certification Program

CERTIFIED MAIL™

7010 3090 0000 5045 4945

5

CVRWQCB
SUITE 200
11020 SUN CENTER DR
RANCHO CORDOVA CA 95670

UNITED STATES POSTAGE
PITNEY BOWES
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0004395646 SEP 08 2011
MAILED FROM ZIP CODE 95670

Megan Smith, Project Manager
ICF International
630 K Street, Suite 400
Sacramento, CA 95814

SS8143331 C011

From: Smith, Megan
Sent: Wednesday, September 14, 2011 1:43 PM
To: Rivasplata, Robert
Subject: FW: South River Road West Sacramento (UNCLASSIFIED)

Hi Robert, please save as a Southport scoping comment.

Thanks,
Megan

-----Original Message-----
From: Suazo, John SPK [mailto:John.Suazo@usace.army.mil]
Sent: Wednesday, 14 September 2011 13:14 PM
To: Judy Ueda
Cc: Smith, Megan
Subject: RE: South River Road West Sacramento (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Ms. Ueda,

Thank you for your comments. Your comments are integral to the scoping process, as well as the development of the project, and will become part of the public record. I encourage you to attend the public meetings scheduled for 3:30 and 6:30 tomorrow, September 15 at the West Sacramento Recreation Center, 2801 Jefferson Boulevard. You will have an opportunity to hear more about the project as well as ask questions of WSAFCA and technical staff, and submit additional comments. If you are unable to attend the public meeting, the project presentation will be available on the City of West Sacramento website: http://www.cityofwestsacramento.org/city/flood/. That information will be available after tomorrow's meetings.

Please feel free to send additional questions to Ms. Megan Smith, or myself.

Thank you.

John

-----Original Message-----
From: Judy Ueda [mailto:jueda423@aol.com]
Sent: Wednesday, September 14, 2011 12:42 PM
To: Suazo, John SPK
Subject: South River Road West Sacramento

The project to implement flood risk reduction along South River Road has serious consequences to the residents who live within a 1000 feet along the river. I suspect that this “shovel ready” project will displace my 94 year old father for the second time in his life. The first time when he lost everything in the 1940’s to be placed in a relocation camp with other Japanese Americans.

However, my comments are: 1) Where is the evidence that the levee is weak on the South Road between the inlet to the Port and South Cross levee? Be specific. 2) Site the research that more or less proves that your proposal for the second levee will prevent flooding. 3) Is this proposal necessary in order to obtain federal money to employ as many people as possible due to a weak California economy? 4) Do you have to use scare tactics to get your point across? Katrina was a hurricane. New Orleans is below sea level. The levees and the pumping stations keep the water out of the city.

Judy (Yokoyama) Ueda

Classification: UNCLASSIFIED
Caveats: NONE

The Southport Sacramento River Early Implementation Project

Comment Card

WSAFCA West Sacramento Area Flood Control Agency

US Army Corps of Engineers® Sacramento District

Name: Karen Kubo Date: 9/16/2011

Telephone: (916) 372-3244 Email: Ku98@aol.com

Affiliation: Richard T. Kubo Title (if applicable): father – property @ 4480 S. River Road

Street Address: 559 Watercolor Lane

City: W. Sacto State: CA Zip: 95605

Thank you for your interest in this flood risk-reduction effort. The West Sacramento Area Flood Control Agency, and the U.S. Army Corps of Engineers value your input regarding this Early Implementation Project. Please provide us with your comments regarding the scope of the Environmental Impact Statement/ Environmental Impact Report being prepared for this project. Please write legibly.

For your convenience, feel free to take this card with you, fill it out at your opportunity, and mail it. You may also send comments by email to *southportcomments@icfi.com*. ***All comments must be postmarked by September 26, 2011***. Thank you for your interest in the Southport Sacramento River EIP.

- post questions + answers on website, so that other landowners can read
- How do you determine the cost of land that is going to be used for each property owner for the year 2013?
- Who is going to pay for homes that need to be moved or re-located on their property
- Cost of septic tank & landscaping costs – once project is done –
- ~~Who~~ How much is given to a family if they have to seek other housing costs during re-construction of the levee?
- What is the timeframe for levee repair – if it is done at each property?
- How is each property owner's property tax going to be affected during the levee repair?

The Southport Sacramento River Early Implementation Project

PLEASE FOLD ALONG THIS LINE FOR MAILING

SACRAMENTO CA 957

17 SEP 2011 PM 1 1

USA FIRST-CLASS FOREVER

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

95814+3331

The Southport Sacramento River Early Implementation Project

Comment Card

WSAFCA West Sacramento Area Flood Control Agency

US Army Corps of Engineers Sacramento District

Name: DIANE MCCRAY Date: 9-20-11

Telephone: 916-371-1938 Email:

Affiliation: J.F. MCCRAY PLASTERING INC Title (if applicable): President

Street Address: 2590 South RIVER ROAD

City: WEST SACRAMENTO State: CA Zip: 95691

Thank you for your interest in this flood risk-reduction effort. The West Sacramento Area Flood Control Agency, and the U.S. Army Corps of Engineers value your input regarding this Early Implementation Project. Please provide us with your comments regarding the scope of the Environmental Impact Statement/ Environmental Impact Report being prepared for this project. Please write legibly.

For your convenience, feel free to take this card with you, fill it out at your opportunity, and mail it. You may also send comments by email to *southportcomments@icfi.com*. ***All comments must be postmarked by September 26, 2011***. Thank you for your interest in the Southport Sacramento River EIP.

I HAVE RESIDED @ 2590 S. RIVER RD SINCE 1976. IT HAS BEEN MY HOME & BUSINESS OPERATIONS FOR OVER 35 YRS. I AND MY DECEASED HUSBAND RAISED OUR CHILDREN HERE AND STARTED A BUSINESS OPERATION FOR A PLASTERING COMPANY, WHICH EMPLOYS OVER A 100 EMPLOYEES. DUE TO THE LEVY RECONSTRUCTION PROJECT BY THE WSAFCA + ARMY CORP ENGINEERS WOULD FORCE ME TO RELOCATE MY RESIDENCE & BUSINESS; THIS COULD CAUSE ME TO LOOSE BOTH, DUE TO THE DOWNSIZE OF TODAYS ECONOMY. THERE ARE VERY FEW PARCELS OF LAND WHICH ALLOW YOU TO OPERATE A BUSINESS & RESIDENCE ON THE SAME PARCEL, IS WHY WE PURCHASED THESE 7 ACRES. I AM 66 YRS OLD AND A WIDOW LIVING ON A FIXED INCOME. I HAVE NOTHING BUT MENTAL ANGUISH OVER LOSING MY HOME/BUSINESS AND MY CHILDREN'S INHERITANCE. WE MOVED HERE KOWING WELL OF THE POTENTIAL FOR FLOODING. I DO NOT FEEL THE NEED TO UPROOT ME AND MY FELLOW NEIGHBORS TO PROTECT THE WEST SACRAMENTO COMMUNITY WHO HAD FREE WILL MOVING INTO LOCATIONS KNOWING OF POTENTIAL FLOODING. THEY WERE INFORMED THAT THEY WERE IN A POTENTIAL FLOOD PLAN AREA AND COULD HAVE BOUGHT ELSEWHERE.

The Southport Sacramento River Early Implementation Project

PLEASE FOLD ALONG THIS LINE FOR MAILING

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

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MAILED FROM ZIP CODE 95691

PLACE POSTAGE HERE

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

95814$3331 C011

The Southport Sacramento River Early Implementation Project

Comment Card

WSAFCA West Sacramento Area Flood Control Agency

US Army Corps of Engineers Sacramento District

Name: Jim Colgan Date: 9/20/2011

Telephone: 916 6172243 Email:

Affiliation: Title (if applicable):

Street Address: 2310 Cable Court

City: West Sacramento State: CA Zip: 95691

Thank you for your interest in this flood risk-reduction effort. The West Sacramento Area Flood Control Agency, and the U.S. Army Corps of Engineers value your input regarding this Early Implementation Project. Please provide us with your comments regarding the scope of the Environmental Impact Statement/ Environmental Impact Report being prepared for this project. Please write legibly.

For your convenience, feel free to take this card with you, fill it out at your opportunity, and mail it. You may also send comments by email to *southportcomments@icfi.com*. ***All comments must be postmarked by September 26, 2011***. Thank you for your interest in the Southport Sacramento River EIP.

It makes sense to me to spare the homes that exist on S. River Road since there are other options available.

Consider the emotional issues potentially created by forcing homeowners to move — when they don't have to be moved.

Thank you

Jim Colgan

The Southport Sacramento River Early Implementation Project

PLEASE FOLD ALONG THIS LINE FOR MAILING

SACRAMENTO CA 95?

22 SEP 2012 PM 2 1

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

95814+3331

From: pamelagould@hughes.net
To: southportcomments
Cc: john.suazo@usace.army.mil
Subject: Comments re Southport Sac River EIP
Date: Tuesday, September 20, 2011 4:55:50 PM

Re: Property address: 4395 Gregory Avenue, West Sacramento

Hello ~

We attended the Southport Sacramento River Early Implementation Project informational meeting last week and would like to offer input with regard to our property. When planning alignment or re-alignment of South River Road where it intersects Gregory Avenue at the railroad trussel, we have some concerns for the levee improvement project and the City of West Sacramento.

At the site of our property and the railroad trussel, at the most eastern portion of our property, we have noticed ongoing public activity which puts the levee improvement project and the City of West Sacramento at risk of liability. The public is accessing the railroad hiking and biking trail by climbing, riding bicycles, horses, motorcycles and quadrunners by climbing and/or riding UP AND DOWN the side of the railroad berm. We have witnessed quadrunners not successful in attempting to reach the top of the berm nearly flipping their quadrunners over backwards, including children as passengers. We have also witnessed a second quadrunner attach a chain and pull another quadrunner to the top because the second quad was unable to successfully climb the berm. As well as many individuals attempting to climb up to the top of the trussell and/or trail and falling down because it is steep.

We have also witnessed and asked to leave numerous juveniles on the trussel throwing rocks onto our property, the street where motorcycles can lose traction as they turn onto or off South River Road, and on two occasions have asked them to leave because they were shooting a gun across the roadway from on top of the railroad overcrossing. On a regular basis cars are parking on our property east of our driveway to access the trail.

The roadway also is curved at this location, and many drivers do not heed the speed limit signs and are continually skidding their tires in an attempt to maneuver the turn at this location. I (Pam) was struck by a driver who was not able to maneuver the turn, skidded through the gravel, hit my car nearly head-on, and my car ended up in the field across the street, as the driver continued to speed toward Jefferson Boulevard. The hit-and-run driver was never apprehended. This area is very confusing to drivers, and people are continually stopping at the intersection of Gregory Avenue and South River Road causing risk of a traffic accident while they attempt to figure out which direction to drive.

There has been an increased amount of truck traffic, including Raley's, semi-tractor-trailer rigs, and delivery trucks, attempting to make South River Road a shortcut, thereby avoiding I-5 traffic.

We think this project lends itself to a good opportunity for the levee improvement project and the City of West Sacramento to correct some of these problems by roadway design and possibly plugging the railroad trussel. All the recreation in this area could be accessed at marinas and boat ramps that are in existence. However

because the railroad trussel allows access in a dangerous way to the public, we are of the opinion that people will still attempt to access the hiking/biking trail if an opportunity exists.

We feel it of utmost importance that this issue is addressed so as to alleviate the levee improvement project and the City of West Sacramento's liability due to injury or death by the public having to find their own access in a dangerous place that is not meant for their use and assisting drivers in finding an easier route to maneuver the river's dangerous and winding roadways.

Please feel free to contact us if you have any further questions that we have not addressed.

Thank you,

Steve & Pam Gould
4395 Gregory Avenue
West Sacramento, CA 95691
pamelagould@hughes.net
(916)372-4042

From: Smith, Megan
To: southportcomments
Subject: FW: West Sacramento Southport Levee Improvements (UNCLASSIFIED)
Date: Tuesday, August 30, 2011 1:01:15 PM

From: Suazo, John SPK [mailto:John.Suazo@usace.army.mil]
Sent: Monday, 29 August 2011 14:44 PM
To: Smith, Megan
Cc: Turner, Claire Marie SPK
Subject: FW: West Sacramento Southport Levee Improvements (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Megan,

This is the third comment, to my knowledge, and was the only one that was addressed only to me. Please let me know if you have others, or if you have any questions. Thanks.

John

From: Rob Hughes [mailto:rob@sigmawebconsulting.com]
Sent: Monday, August 29, 2011 12:16 PM
To: Suazo, John SPK
Subject: West Sacramento Southport Levee Improvements

John Suazo,

I am a resident of Southport in West Sacramento. I received a notice about potential levee improvements in our area. I will not be able to attend the informational meetings, but I wanted you to have my feedback.

Even without seeing the plan, I can tell you that I support levee improvements to the **fullest extent possible**, even if it means greater cost, claiming more land, removing existing structures or modifying the ecosystem. Maximum protection is my greatest priority, and improved recreation will be a welcome bonus.

I understand that some agencies don't like trees and foliage on levees for various reasons, including the extra difficulty involved in inspecting levees. I believe the reasons for having trees are greater, and **I want trees**.

Thanks for receiving my feedback.

Robert Hughes

3079 Apache Street
West Sacramento, CA 95691

916 273 0638

Classification: UNCLASSIFIED
Caveats: NONE

12

From: addieontheriver@aol.com
To: southportcomments
Cc: john.suazo@usace.army.mil
Subject: Levee comments
Date: Friday, September 16, 2011 9:30:59 AM

TO: West Sacramento Area Flood Control Agency:

My comment is simple: In your considerations, PLEASE put people who live along the levee FIRST (before animals AND money).
If you do, God will bless your project - and you will succeed in keeping everyone safe in West Sacramento!
God Bless You and help you make the right decision.

THANKS A MILLION for understanding the people who live along the levee.
You should be proud of them for having such wholesome (country) values.
They certainly are an asset to the City of West Sacramento!

Gratefully,

Sister Michael

From: David Gully
To: southportcomments
Cc: john.suazo@usace.army.mil
Subject: Levee Improvement Comments
Date: Wednesday, September 21, 2011 1:19:59 PM

To whom it may concern,

I would like to stress my opinion and comments for the levee improvements. I've been a West Sacramento resident for 42 years and have grown to know several friends that live along the the levee. For some reason, these people who live in this area are highly respected people. They are down to earth citizens compared to the newcomers of the West Sacramento area.
They have a high amount of respect for the area in which they live as well. Most of them have been here all of their lives from generations passed on. Some are farmers and the forefathers of this land. These are hard working tax paying citizens that have resided in West Sacramento all of their lives. I don't understand why several generations of families would have to give up their homes and or farm land that they have invested in all of these years just for an improvement of the levees.

Improving the levees is a good thing but I think it is very unfair to try and push these human beings out of their homes only because it is the cheaper way to do it. These people have children and a lot of investment in these homes. In my opinion, this beautiful land is the best part of West Sacramento to live in.
I understand that the levees need improvements but I also believe that there is a way to do it by keeping all of these families in their well deserved homes. It is obvious that West Sacramento is trying to uphold a very bright and positive persona. But by forcing people out of their homes isn't acceptable. It will only hurt and bother all of these families, not to mention all the other West Sacramento residents who have knowledge of this for years and years to come.

I also think it is very unfair to offer them a fair market price for their homes when the economy is down far more than average.
Please be more sensitive to the issue that the only way for everyone to win in this situation is to do what is right and the right thing is to keep the families in their homes so that West Sacramento remains a happy community.
It is a dream to be able to live along the River Road. Please don't destroy these dreams of our loveable River Road residents.
Thank you for allowing my input on such an important matter.

Sincerely,

David Gully
1818 Trinity Way
West Sacramento, CA 95691

916 372 7638

From: Smith, Megan
To: southportcomments
Subject: FW: Southport Comment (UNCLASSIFIED)
Date: Monday, September 26, 2011 8:24:11 AM

-----Original Message-----
From: Suazo, John SPK [mailto:John.Suazo@usace.army.mil]
Sent: Monday, 26 September 2011 8:01 AM
To: Smith, Megan
Subject: FW: Southport Comment (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

In case you had not received this.

-----Original Message-----
From: Thami Rodgers [mailto:thamirodgers@yahoo.com]
Sent: Sunday, September 25, 2011 7:21 PM
To: Suazo, John SPK
Subject: Southport Comment

Mr. Suazo - Please confirm receipt of this email.

Thamarah Rodgers Lacomb
4444 South River Road
West Sacramento, CA 95691

September 26, 2011

Mr. John Suazo
U.S. Army Corps of Engineers
Sacramento District (CESPK-PD-R)
1325 J Street
Sacramento, CA 95814

Re: Southport Sacramento River Early Implementation Project ("EIP")
West Sacramento, California

I am a homeowner in Southport along the South River Road, specifically within Reach B. My immediate family members also have three additional homes along this route. My entire family has been on these lands for more than 100 years farming, raising families, and passing the land and homes on to the next generation. As has been done for several generations, a portion of this land was handed down to me, to build a home (constructed in 2004) and to raise a family. My children, ages six and eleven, will be the sixth generation to receive the land and homes upon which we currently live. We have organic gardens, horses and goats, small pets, raise chickens for eggs, raise cattle for meat, and have planted and cared for hundreds of fruit trees and more than 75 native and non-native oak trees.
On our home site, there is a vast array of wildlife that will be destroyed when ANY levee improvement is made. Snakes, gophers, hummingbirds, fox, coyote, turkey, turtles, pheasant, the list literally could go on and on.
Beyond the natural life, our part of the South River Road is beautifully constructed with well-maintained homes. The traffic on weekends and holidays along our route is incredible as people drive and enjoy the scenery and

wildlife. The rural character and farming history is a draw to the area. Its charm and qualities should be preserved not destroyed as it will and can never be replaced or returned to what it is today.

It is of the utmost importance, that the impending levee improvements be constructed in a way that has the least impact to our homes, families and properties. Please know we are supportive of improving the levees, however the excessive taking of private property in a setback levee scenario as proposed in Alternative 2 is absurd. It is clear the intent is to construct setback levees because the additional funding source will be substantial with this type of improvement. Setback levees should not be the answer. They are expensive from a land acquisition perspective, require the ripping out and then replacing of habitat to the detriment of any living thing in its path, and require enormous state, federal, and local funding efforts. A setback levee is the least favorable option, as it imposes the greatest harm to the residents, farm land, cultures, future generations, and to the beauty and character of the area. It is unconscionable that a few should bear the burden when other solutions exist that still benefit the whole.

Another alternative, Alternative 2, is the combination of an adjacent levee with seepage berm. This alternative is also unfavorable as it too takes most of the homes, destroys existing habitats, and will create the same aesthetic eyesore as stated above.

With the construction of setback levees and seepage berms come situations for environmental considerations. For example, land sites used to borrow soil to construct seepage berms and/or setback levees will never be returned to their present conditions as contractors will gouge out massive areas of land and carry the soil away to construction sites. Not only will seepage berms and setback levees ravage lands and habitats, and devastate families and their future generations, but the areas surrounding the construction site will also experience, possibly 24-hours a day, substantial impacts including:

disruptive noise and destructive land vibrations from construction equipment, high volume of dangerous semi-trucks and trailer traffic through neighborhoods and near schools, roadway damage as a result of increase use and heavy load weights caused by semi-truck traffic hauling routes, incapacitating construction and roadway dust, poor air quality and diesel exhaust as a result of heavy equipment and semi-trucks, long traffic delays along main thoroughfares, and dangerous or inaccessible bike paths and jogging routes.

Another alternative plan, specifically Alternative 3, that may include slope flattening with relief wells and/or slurry walls, is the least intrusive to plant, animal and most importantly, human life. This plan is the only plan to save most of the homes along Reach B. Alternative 3 should be the preferred plan as it preserves peoples' homes. If the intent of the Government is to prevent the greatest private injury while providing public safety, then Alternative 3 must be selected as the preferred plan.

Additionally in support of Alternative 3, along Reach B, there have been NO problems with the levee during high water levels. Improvements were made in 1965 and again as a part of a larger project in 1986. The levee in this section is in good shape and should not require drastic improvements that destroy the landscape and private lives.

For these reasons stated, I request Alternative 3 continue to be studied and included as a preferred alternative.

When solutions to an understood problem are only a difference between technical approaches, those solution having the least private injury, yet still accomplishing the same goal, should be the preference.

Thamarah Rodgers Lacomb

Classification: UNCLASSIFIED
Caveats: NONE

From: Laurie Melson
To: southportcomments
Subject: levee improvements
Date: Monday, September 26, 2011 10:11:27 AM

I'm writing this email in an effort to encourage the City of West Sacramento to design a levee improvement that will not affect the rural homes along the South River Road. As a lifelong resident of West Sacramento we would like to preserve this scenic drive along the river and avoid affecting the residents that have homes their currently.

Thank you for your consideration.

Laurie C. Melson
Property Manager
Embarcadero Realty Services LP
1750 Creekside Oaks Drive, Suite 215
Sacramento, California 95833
916.286.4249 direct
916.646.3245 fax
http://www.ecp-llc.com

From:	Dick Sestero
To:	southportcomments
Subject:	Southport Levee Project
Date:	Monday, September 19, 2011 4:11:58 PM
Attachments:	South Levee Plan.pdf

I attended the presentation last week. I would like to know if you can forward me a copy of the schematic drawings which were on the boards in the rear of the room which showed the approximate footprint of the different levee improvement alternatives in the area circled on the attached plan. Thank you.

Richard D. Sestero
Project Manager
Seeno Construction Company
4021 Port Chicago Highway
Concord, CA 94520
Phone: 925-602-7235
Fax: 925-689-5979
Cell: 925-858-7999

West Sacramento Flood Protection Program

Southport Early Implementation Project

FACT SHEET

What is the Southport Early Implementation Project?

A levee improvement project that will improve nearly six miles of the Sacramento River South Levee.

Why is WSAFCA improving levees in West Sacramento?

- To increase public safety and protect property, our city's number one priority.
- To achieve a minimum 200-year level of flood protection as required by the Central Valley Flood Protection Board.
- To ensure continuing federal and state funding assistance for levee repairs and maintenance.
- To provide recreation and open space elements for the city where practical and compatible with flood protection improvements and operations.

What are the benefits of the Southport Early Implementation Project?

- To increase public safety and protect property.
- Expanded recreational opportunities and open space conservation in West Sacramento; more details will become available as the design process progresses.

Southport EIP Project Map

What are Early Implementation Projects (EIPs)?

EIPs are projects that accelerate remediation of the most significant levee deficiencies and most quickly reduce exposure to flood risks. WSAFCA selects, designs and builds EIPs that assure state and federal funding and regulatory assistance.

How will the community be affected by the Southport EIP?

- Most West Sacramento community members will not be directly affected by construction or operation of the Southport EIP.
- WSAFCA is currently working with property owners in the Southport area to perform environmental and engineering surveys necessary to evaluate different levee design alternatives.
- Until the most effective levee alternative is formulated, WSAFCA representatives are unable to specifically determine how community members will be inconvenienced during construction.

From: Hogan, Phil - Woodland, CA
To: southportcomments
Subject: Shape files
Date: Thursday, August 25, 2011 10:01:49 AM

Ms Smith:

I was wondering if I could get the GIS shape files for the study area for the Southport Sacramento River EIP.

Thanks!

_____

PHIL HOGAN, District Conservationist
USDA Natural Resources Conservation Service
221 West Court Street, Suite 1
Woodland, CA 95695
(530) 662-2037 X 111
(530) 662-4876 FAX
phil.hogan@ca.usda.gov

From: sdaues
To: john.suazo@usace.army.mil; southportcomments
Subject: Southport River South Levee EIP
Date: Friday, August 26, 2011 8:50:40 AM

Hello Mr. Suazo and Ms. Smith,
I have just finished reviwing the matierals at the City website. I didnt see much substance that would allow for any menaingful comment. Will more project details be available at the meetings? I am not sure I can make either one, so I would appreciate access to the info. For example, I was wondering if the project involved looking at more set-back levee options where there is space to do so, possible abondonement of South River Road, and allowances for future river crossings.
I am a resident at 2981 Rubicon Way, which about 3/4 mile from the levee at Linden Road.
Thanks for your work on this and good luck with the project.

Stephan Daues

From: Mark Zollo
To: southportcomments
Subject: Southport Sacramento River EIP
Date: Monday, September 19, 2011 8:52:39 PM

Hello,

Will the Project consider the impact of the various levee design alternatives on West Sacramento's ground water levels and, if there are changes, how those changes may effect the city's large caliper tree canopy?

Thanks!

From: Rivett, John
To: southportcomments
Cc: michaelb@cityofwestsacramento.org
Subject: Southport Sacramento River EIP Meeting Comments
Date: Sunday, September 18, 2011 9:48:18 PM

First, I commend West Sacramento's efforts to rebuild and strengthen its levees and mitigate risk for the majority of residents. It appears we're going in the right direction, unlike on the other side of the river, which is beyond our control or jurisdiction. However, a recent article I read left me feeling the levees should have been built long ago—like yesterday!!

The New York Times article *California's Next Nightmare: How a Failing Levee System Could Turn Sacramento into the Next Atlantis* (July 3, 2011) points out how vulnerable we are here. Such triggers for levee failure could come from earthquakes or super storms. Given the erratic weather patterns worldwide over the last several years this should be a major concern for us here. The article didn't even mention global climate change and how water levels are projected to rise.

In the meeting there were several home owners who may be affected by displacement and they questioned the statistical probability of a catastrophic flood, often rather scornfully. After I left the meeting it occurred to me that I should have turned the tables on them and asked if they can guarantee with 100% certainty that a catastrophic flood WILL NOT happen here. We have a history of floods here and we're at a very low elevation. Nobody likes to lose their homes, but how many homes are we looking at saving? I can't imagine it's more than two or three dozen homes on that six mile stretch. America has a long tradition of building in hazardous areas where homes should not have been built. Do we save a few homes and put thousands and thousands of other homes at risk? In this case for public safety, the interests of the greatest number overrule those of a small faction. Besides, if the levees are not rebuilt to appease a small faction, what recourse would the majority have when a catastrophic flood does occur?

Whichever form the project takes, I would like to see more recreational use, like bike paths, and habitat restoration. I also hope the Army Corps of Engineers would abide by the results of their own study and allow trees at the base of levees. The river habitat is equally important.

John Rivett
2527 La Jolla St
West Sacramento, CA 95691
Phone: 916-371-4103

John M. Rivett
Marquette University
2527 La Jolla Street
West Sacramento, CA 95691
Cell: 414-841-4210

From:	Tony Sauer
To:	southportcomments; john.suazo@usace.army.mil
Cc:	"tonysauer"
Subject:	West Sacramento Levee Wheelchair Access
Date:	Friday, August 26, 2011 12:35:34 PM

I own a condo at Riva on the River in West Sacramento. My condo is adjacent to the levee and the proposed improvements. Currently there is no wheelchair access to the levee, and I am writing to be sure this issue will be remedied during the levee improvement construction. There are several others besides myself who happen to live in this complex, and we would greatly appreciate being able to enjoy the river with our friends and family.

As you probably know, Section 503 and 504 of the Federal Rehabilitation Act and Title II of the Americans with Disabilities Act require any project or program with Federal or State funding to accommodate people with disabilities. I assume that you have already addressed the access deficiencies in the requited Transition Plans and have plans to place ramps up the new levee. Because the Riva on the River Condos house a large number of residents with disabilities, I hope you place a ramp near or at the complex.

I am happy to offer further thoughts or guidance and can be reached via cell at 530-913-7669.

Onward,

Tony Sauer

DELTA PROTECTION COMMISSION
14215 RIVER ROAD
P.O. BOX 530
WALNUT GROVE, CA 95690
Phone (916) 776-2290 / FAX (916) 776-2293
Home Page: www.delta.ca.gov

Contra Costa County Board of Supervisors

Sacramento County Board of Supervisors

San Joaquin County Board of Supervisors

Solano County Board of Supervisors

Yolo County Board of Supervisors

Cities of San Joaquin County

Cities of Contra Costa and Solano Counties

Cities of Sacramento and Yolo Counties

Central Delta Reclamation Districts

North Delta Reclamation Districts

South Delta Reclamation Districts

Business, Transportation and Housing

Department of Food and Agriculture

Natural Resources Agency

State Lands Commission

August 22, 2011

Megan Smith, ICF International
I/C of West Sacramento Area Flood Control Agency
630 K Street, Suite 400
Sacramento, CA 95814

Subject: Southport Sacramento River Early Implementation Project (SCH#: 2011082069)

Dear Ms. Smith:

The staff of the Delta Protection Commission (Commission) has reviewed the Notice of Preparation (NOP) for the Southport Sacramento River Early Implementation Project draft Environmental Impact Report (EIR) and are providing these advisory comments. Although the project lies outside of the Primary Zone of the Delta, it still has the capability to affect resources of the Delta's Primary Zone environment.

The implementation of flood risk-reduction measures is consistent with the Commission's Land Use and Resource Management Plan for the Primary Zone of the Delta (Management Plan); which includes a goal of supporting the improvement, emergency repair, and long-term maintenance of Delta levees and channels. The Management Plan also includes a policy to support programs to make cost-effective levee investments in order to preserve the economy and character of the Delta.

The NOP also mentions that ecosystem restoration and public recreation opportunities would occur through this project. Ecosystem restoration and public recreation projects are generally consistent with goals and policies of the Management Plan, as long as the projects remain compatible with Delta agricultural practices. If the project will have any possible impact on Delta agricultural, these possible impacts and any proposed mitigation measures should be identified in the EIR.

Thank you for the opportunity to provide input. Commission staff looks forward to reviewing the full EIR/EIS. Please contact the Commission office at (916) 776-2290 if you have any questions about the comments provided.

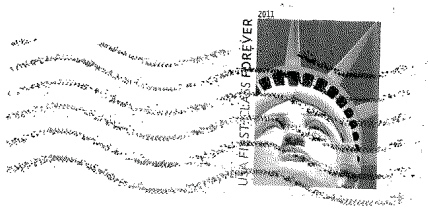
Sincerely,

Michael Machado
Executive Director

cc: State Clearinghouse in the Office of Planning and Research

STATE OF CALIFORNIA
DELTA PROTECTION COMMISSION
14215 River Road
P.O. Box 530
WALNUT GROVE, CA 95690

SACRAMENTO CA 957
22 SEP 2011 PM 4 T



Megan Smith, Project Manager
ICF International
630 K St., Suite 400
Sacramento, CA

95814

The Southport Sacramento River Early Implementation Project

WSAFCA West Sacramento Area Flood Control Agency

US Army Corps of Engineers Sacramento District

Comment Card

Name: Christopher Lacomb Date: 9/20/11

Telephone: 916 375 1952 Email: Chris_Lacomb@Yahoo.com

Affiliation: resident of WS Title (if applicable):

Street Address: 4444 South River Rd.

City: West Sacramento State: CA Zip: 95691

Thank you for your interest in this flood risk-reduction effort. The West Sacramento Area Flood Control Agency, and the U.S. Army Corps of Engineers value your input regarding this Early Implementation Project. Please provide us with your comments regarding the scope of the Environmental Impact Statement/ Environmental Impact Report being prepared for this project. Please write legibly.

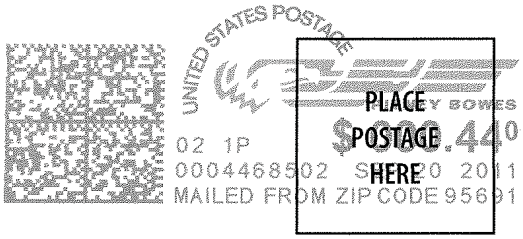
For your convenience, feel free to take this card with you, fill it out at your opportunity, and mail it. You may also send comments by email to *southportcomments@icfi.com*. ***All comments must be postmarked by September 26, 2011***. Thank you for your interest in the Southport Sacramento River EIP.

Choose a levee plan that provides 200 year flood protection that will not remove homes along the levee no matter the cost, these residents have lived in this community for many years and deserve to be protected from having their homes removed. There are plan's to protect these homes and City needs to do the Slurry wall.

The Southport Sacramento River Early Implementation Project

PLEASE FOLD ALONG THIS LINE FOR MAILING

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814



West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

95814433331 C011

The Southport Sacramento River Early Implementation Project

Comment Card

24

WSAFCA
West Sacramento Area Flood Control Agency

US Army Corps of Engineers
Sacramento District

Name: Deeden Kimbrough Date: 9-22-11

Telephone: (916) 371-5453 Email:

Affiliation: Home Owner Title (if applicable):

Street Address: 1306 Linden Rd.

City: W. Sacto. State: CA. Zip: 95691

Thank you for your interest in this flood risk-reduction effort. The West Sacramento Area Flood Control Agency, and the U.S. Army Corps of Engineers value your input regarding this Early Implementation Project. Please provide us with your comments regarding the scope of the Environmental Impact Statement/ Environmental Impact Report being prepared for this project. Please write legibly.

For your convenience, feel free to take this card with you, fill it out at your opportunity, and mail it. You may also send comments by email to *southportcomments@icfi.com*. ***All comments must be postmarked by September 26, 2011***. Thank you for your interest in the Southport Sacramento River EIP.

The setback levees will destroy family homes, disrupt animal habitats (already living along the River) and destroy agricultural farms. It saddens me to think the Army Corp of Engineers and the W. Sacto. Area Flood Control Agency could even consider destroying all of these things.

I know that alternative levee improvements can be done without destroying homes & farms. I live on Linden Rd. and believe a slurry wall is being constructed north of my home. A slurry wall through the middle of the existing levee south of Linden Rd. (3ft wide & into the soil 130 feet) isn't impossible, keeping our families & wildlife in their homes. Please consider improving the levees without destroying our beautiful & peaceful country views.

Thank you

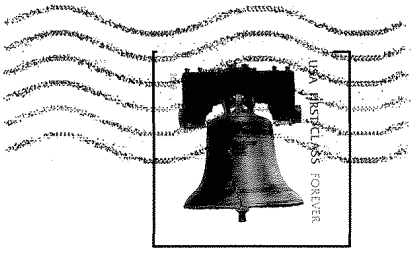
Deeden Kimbrough

The Southport Sacramento River Early Implementation Project

PLEASE FOLD ALONG THIS LINE FOR MAILING

SACRAMENTO CA 957

22 SEP 2011 PM 5 T



West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

The Southport Sacramento River Early Implementation Project

Comment Card

WSAFCA West Sacramento Area Flood Control Agency

US Army Corps of Engineers Sacramento District

Name: BRET Culbreth Date: 9/15/11

Telephone: 9164388300 Email: bculbreth@calsuvo.a

Affiliation: condemnee Title (if applicable):

Street Address: 4400 S River Rd.

City: W. SAC State: Zip: 95691

Thank you for your interest in this flood risk-reduction effort. The West Sacramento Area Flood Control Agency, and the U.S. Army Corps of Engineers value your input regarding this Early Implementation Project. Please provide us with your comments regarding the scope of the Environmental Impact Statement/ Environmental Impact Report being prepared for this project. Please write legibly.

For your convenience, feel free to take this card with you, fill it out at your opportunity, and mail it. You may also send comments by email to *southportcomments@icfi.com*. ***All comments must be postmarked by September 26, 2011***. Thank you for your interest in the Southport Sacramento River EIP.

(1) You have the option to do pure flood control but have other agendas thus unnecessarily taking our house

(2) we will not recieve "just compensation" because none would sell their property in the worst market since the great depression if they did not have to

The Southport Sacramento River Early Implementation Project

PLEASE FOLD ALONG THIS LINE FOR MAILING

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

PLACE
POSTAGE
HERE

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

The Southport Sacramento River Early Implementation Project

WSAFCA West Sacramento Area Flood Control Agency

US Army Corps of Engineers Sacramento District

Comment Card

Name: Kevin Winter Date: 9/15/11

Telephone: 916-681-3634 Email: julkev@aol.com

Affiliation: son of landowner Title (if applicable):

Street Address: 8791 Silverberry Ave.

City: Elk Grove State: CA Zip: 95624

Thank you for your interest in this flood risk-reduction effort. The West Sacramento Area Flood Control Agency, and the U.S. Army Corps of Engineers value your input regarding this Early Implementation Project. Please provide us with your comments regarding the scope of the Environmental Impact Statement/ Environmental Impact Report being prepared for this project. Please write legibly.

For your convenience, feel free to take this card with you, fill it out at your opportunity, and mail it. You may also send comments by email to *southportcomments@icfi.com*. ***All comments must be postmarked by September 26, 2011***. Thank you for your interest in the Southport Sacramento River EIP.

Instead of a seepage Berm why not build a relief well? You do not have to drill that deep in that sandy soil. If Seepage berm comes to close to the property on Davis Road will be useless, so you will need to buy us out. Also those lakes near the Marina are not going to go away. Davis Road can't handle all that heavy contruction traffic, it is a two lane road that can fall apart easily.

The Southport Sacramento River Early Implementation Project

PLEASE FOLD ALONG THIS LINE FOR MAILING

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

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West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

The Southport Sacramento River Early Implementation Project

Comment Card

WSAFCA West Sacramento Area Flood Control Agency

US Army Corps of Engineers Sacramento District

Name: Rebecca Wall Date: 9/13/11

Telephone: 916 372 4840 Email: RW@SQ1-STUDIO.COM

Affiliation: RESIDENT Title (if applicable):

Street Address: 2690 BEVAN RD

City: WEST SACRAMENTO State: CA Zip: 95691

Thank you for your interest in this flood risk-reduction effort. The West Sacramento Area Flood Control Agency, and the U.S. Army Corps of Engineers value your input regarding this Early Implementation Project. Please provide us with your comments regarding the scope of the Environmental Impact Statement/ Environmental Impact Report being prepared for this project. Please write legibly.

For your convenience, feel free to take this card with you, fill it out at your opportunity, and mail it. You may also send comments by email to *southportcomments@icfi.com*. ***All comments must be postmarked by September 26, 2011***. Thank you for your interest in the Southport Sacramento River EIP.

1- Can there be any modifications to the alternative options to save homes?

2- Will this mean W. SAC SIDE WILL BE SAFE FROM BEING PURPOSLY FLOODED TO SAVE SACRAMENTO SIDE? IF NECESSARY

3- WHY WOULD WE NOT DO DREDGING OF THE RIVER (SPLIT COST W SAC SIDE) AS AN ALTERNATIVE OR IN ADDITION TO?

4- IF ARMY CORP HAS WAFFLED ON TREE VEGITATION CRITERIA GUIDES, WHOSE TO SAY THEY WON'T WAFFLE ON NEW CRITERIA? FOR LEVEE DESIGN?

5- WHAT ABOUT EXIT STRATEGIES IF FLOOD DOES HAPPEN? WE DON'T HAVE GOOD ESCAPE ROUTES WITH LIMITED BRIDGES AND ROADS OUT OF THE CITY?

6- I VOTE FOR SLURRY WALL TO SAVE HOMES.

Thanks!

The Southport Sacramento River Early Implementation Project

PLEASE FOLD ALONG THIS LINE FOR MAILING

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

PLACE
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West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

The Southport Sacramento River Early Implementation Project

Comment Card

WSAFCA West Sacramento Area Flood Control Agency

US Army Corps of Engineers Sacramento District

Name: Terry Annesley Date: 9/15/11

Telephone: 916/438 8300 Email: tcannesley@calsubro.com

Affiliation: Victim Title (if applicable):

Street Address: 4400 S. River Rd.

City: W. Sacto State: CA Zip: 95691

Thank you for your interest in this flood risk-reduction effort. The West Sacramento Area Flood Control Agency, and the U.S. Army Corps of Engineers value your input regarding this Early Implementation Project. Please provide us with your comments regarding the scope of the Environmental Impact Statement/ Environmental Impact Report being prepared for this project. Please write legibly.

For your convenience, feel free to take this card with you, fill it out at your opportunity, and mail it. You may also send comments by email to *southportcomments@icfi.com*. ***All comments must be postmarked by September 26, 2011***. Thank you for your interest in the Southport Sacramento River EIP.

1. Being treated like ignorant fools
2. No truth in planned option (you know what option is planned)
3. Not given a timeline (always vague "estimates", nothing "firm" yet)
4. Quote from Council member does not agree w/ what "info" is given in meeting.

The Southport Sacramento River Early Implementation Project

PLEASE FOLD ALONG THIS LINE FOR MAILING

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

PLACE
POSTAGE
HERE

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

29 original sent to John Suazo 9/26/11

Albert W. Rodgers
4440 South River Road
West Sacramento, CA 95691

September 26, 2011

Mr. John Suazo
U.S. Army Corps of Engineers
Sacramento District (CESPK-PD-R)
1325 J Street
Sacramento, CA 95814

Re: Southport Sacramento River Early Implementation Project ("EIP")
West Sacramento, California

I have lived in West Sacramento all of my life, owned a family farming corporation for more than 30 years, and supported development and improvements to the City. I am also in favor of improving the levees in Southport. However, the excessive taking of land and homes is not necessary as proposed by some of the alternatives. Plans exist to fix the levees that do not destroy families and property. Additionally, there are methods being used to fix the levees in other parts of the City that if implemented in Reach B, would save the homes. These are the improvements that can and must be done.

Alternative 3 should be the preferred choice as it saves most of the homes, however, improvements to this plan should further be made in an effort to save the remaining homes.

Current open spaces should be used to establish habitat and to create open spaces for flooding, not land currently occupied by families and homes. It appears "habitat" is more important than "humans".

Reach B has not had problems with its infrastructure EVER - I know as I have lived along this stretch all of my sixty- seven years. Reach B is stable and safe and should not require the most extreme, intrusive, and disruptive improvement plan.

"For the greater good of community" can be achieved while "causing the least private injury".

Respectfully,

Albert W. Rodgers

Albert W. Rodgers

Megan Smith
ICF International

Rec
9/26/11
2:00 p.m
BP

30 original sent to John Suazo 9/26/11

Southport Homeowners

Terry Annesley, Vichai Arunyakasem, Cruz and Darlene Charles,
Bret Culbreth, Vachira Homsilpakul, Chris and Thami Lacomb, Kim McDonald,
Paul and Mary Palamidessi, Albert [Buck] and Judi Rodgers,
the Madeline M. Rodgers Trust Estate, Scott S. Rodgers, and Andrew and Cathy Yokoyama

September 26, 2011

Mr. John Suazo
U.S. Army Corps of Engineers
Sacramento District (CESPK-PD-R)
1325 J Street
Sacramento, CA 95814

Re: Southport Sacramento River Early Implementation Project ("EIP")
West Sacramento, California

Dear Mr. Suazo:

We are all homeowners in the Southport area of the City of West Sacramento, California and are writing to comment on the EIP following the scoping meetings held on September 15, 2011.

Here is some information about us.

- We all live on South River Road in Reach B of the proposed EIP. Two of the three proposed alternatives will cause us to lose our homes.
- We all live in West Sacramento and work in West Sacramento or run businesses in West Sacramento and we are fully committed to this community. In fact, Thami and Chris Lacomb's children are the 6th generation of the Rodgers family to live on their land. The Rodgers family has been farming land in Reach B for over 100 years.
- We support the flood control projects generally for the City of West Sacramento and each of us signed right of entry agreements permitting WSAFCA to enter on our property to conduct tests and install testing wells in furtherance of the EIP.

We strongly support Alternative 3 Modified - Segment B, Slope Flattening with Relief Wells ("Alternative 3") for the following reasons:

1. Alternative 3 is the only alternative which preserves most (but not all) of the homes along the Sacramento River in Reach B. The other two alternatives will take **every home but one** in this stretch of the river. Each of us is distraught at the thought of losing our home, especially when there is an alternative that will protect them.

2. We believe Alternative 3 must be studied in the EIR/EIS and that if it is not, the EIR/EIS will be subject to challenge under CEQA. Alternative 3 is the least intrusive alternative, has the least impacts on citizens and results in the least "take" of land and homes. Based on these facts, it should be designated the Preferred Alternative. Further, we understand that Alternative 2 – Segment B, Setback Levee with 250-FT Seepage Berm ("Alternative 2") has been inserted largely to add mitigation land (our land and homes) to the project in a band of land between the new levee and the river in the hope of qualifying for State of California funding. Alternative 2 is not a CEQA alternative; it is nothing but a financing mechanism, at our expense. If only Alternative 2 and Alternative 1- Segment B, Adjacent Levee with 200-FT Seepage Berm ("Alternative 1") are studied in the EIR/EIS, again, we believe that the EIR/EIS will be subject to challenge under CEQA in that (i) the least intrusive alternative has not been included, (ii) Alternatives 1 and 2 fail to adequately mitigate negative impacts and (iii) Alternative 2 is not a true alternative under CEQA, but rather is a device to secure funding at the expense of huge takes of land and homes from West Sacramento citizens.

3. We believe that where there is an alternative that preserves peoples' homes, then government should adopt this alternative, rather than using eminent domain to condemn our homes and land when not absolutely necessary.

4. This is an historic area of West Sacramento and its beauty and appeal add a great deal to our community. The original Silva home, now owned by Terry Annesley and Bret Culbreth, was built in 1906 and is a cultural treasure. West Sacramentans enjoy taking Sunday drives down South River Road and the West Sacramento International Triathlon and the Sacramento Wheelmen follow this route for its country charm. The Walt Gray Charity Ride 2010 and multiple marathons, triathlons and iron man competitions have come down this road. If all the homes are removed from this stretch of the Sacramento River, an important part of West Sacramento culture and history will be lost, as well as the "flavor" and appeal of the South River Road community, to the great detriment of West Sacramento. To put this another way, West Sacramento will lose part of its history if Alternative 3 is not adopted.

5. We understand that there are no engineering barriers to Alternative 3. We have been informed that this alternative may require a slurry wall, similar in depth to that constructed for the I Street Bridge Site or the Rivers Project in the north section of West Sacramento. In fact, the federal Notice of Intent filed in the Federal Register on August 26, 2011, specifically states that the alternatives to be studied include "installing slurry cutoff walls". If the size of the take in Reach B can be reduced by using slurry walls, then we believe this needs to be studied in the EIR/EIS and not dismissed out of hand without consideration.

6. This stretch of the Sacramento River underwent major improvements in 1965 and 1986 and does not have the seepage problems which plague other locations. We understand that there is no critical necessity to do work at this location at this time, except as it has been included with other reaches which do require work.

For the reasons stated above, we respectfully request that Alternative 3 continue to be studied, be included as an alternative in the EIR/EIS which the Army Corps of Engineers and WSAFCA will prepare and that it be designated the "Preferred Alternative".

Respectfully submitted,

Terry Annesley
4400 South River Road
West Sacramento, CA 95691
APN: 046-230-050-000

Vichai Arunyakasem
4360 South River Road
West Sacramento, CA 95691
APN: 046-250-011-000

Cruz Charles
4485 South River Road
West Sacramento, CA 95691
APN: 046-230-015-000

Darlene Charles
4485 South River Road
West Sacramento, CA 95691
APN: 046-230-015-000

Bret Culbreth
4400 South River Road
West Sacramento, CA 95691
APN: 046-230-050-000

Vachira Homsilpakul
4360 South River Road
West Sacramento, CA 95691
APN: 046-250-011-000

Chris Lacomb
4444 South River Road
West Sacramento, CA 95691
APN: 046-230-057-000

Thami Lacomb
4444 South River Road
West Sacramento, CA 95691
APN: 046-230-057-000

Kim McDonald
4390 South River Road
West Sacramento, CA 95691
APN: 046-230-053-000

Mary Palamidessi
4380 South River Road
West Sacramento, CA 95691
APN: 046-250-013-000

Paul Palamidessi
4380 South River Road
West Sacramento, CA 95691
APN: 046-250-013-000

Albert [Buck] Rodgers
4440 South River Road
West Sacramento, CA 95691
APN: 046-230-056-000

Judi Rodgers
4440 South River Road
West Sacramento, CA 95691
APN: 046-230-056-000

Madeline M. Rodgers Trust Estate
Albert Rodgers Executor
Madeline M. Rodgers' Trust Estate
4440 South River Road
West Sacramento, CA 95691
APN: 046-260-016-000

Andrew Yokoyama
4410 South River Road
West Sacramento, CA 95691
APN: 046-230-048-000

Cathy Yokoyama
4410 South River Road
West Sacramento, CA 95691
APN: 046-230-048-000

Scott S. Rodgers
4370 South River Road
West Sacramento, CA 95691
APN: 046-250-018-000

Megan Smith, Project Manager
ICF International
630 K Street, Suite 400
Sacramento

Rec 9/26/11 2:00pm BP

From: Bennis, David
To: southportcomments
Subject: Levee improvements
Date: Monday, September 26, 2011 6:16:47 PM

As a West Sacramento home owner and resident my family and I do not support any measures that would not make saving existing homes a priority. The charm of West Sacrament is that there are older large properties so close to the river and downtown. When we want to take a drive/walk it is not to one of our newer neighborhoods, it is along the river road and through the older rural homes. None of our new developments can replace what these families have built and deserve to keep. Taking their homes is nothing but a selfish option that I can not believe the city is considering. We understand the improvements need to be made however not at the cost of displacing anyone….when there are other options. The reality is there would still be plenty of natural habitat around the river and the ideas/excuses for making this a community space are a sales pitch.

We are shocked and amazed by the insensitivity some of our community leaders have displayed by only supporting the belief that "these homes must go". The reality is we all know of other feasible options for this small stretch of the river that would provide the same security from future flooding/ levee breaches.

Using levee improvements as an excuse to take what these families have built over several generations so it can be redistributed to a developer under the guise of "levee improvements" would be a tragedy. Any elected official who does not support these families will lose my future votes.

Ask yourself, what is the right thing to do? If there is an option that does not take from these people something that can not be replaced why would that not be the option you choose?

Any elected official who does not support these families will lose my future votes.

The Bennis Family
916-201-7853

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error, please notify us immediately by return e-mail and permanently remove the original message and any copies from your computer and all back-up systems.

From:	Kelly Magreevy
To:	southportcomments
Cc:	john.suazo@usace.army.mil
Subject:	Levee Improvements project
Date:	Tuesday, September 27, 2011 6:38:36 AM
Attachments:	image003.png

Hello,

I attended the meeting held on Sept. 15th regarding the levee improvement project for West Sacramento. If I hadn't known the intricate details on this project, I would have been misled regarding the impact on West Sacramento families.

The speaker was very articulate and spoke about what levee improvements would do for West Sacramento: recreation opportunities, preserving vegetation, wildlife, creating more jogging trails along the river, increasing marina access. What wasn't stated during the second meeting was the impact on West Sacramento families, some that have been here for over 100 years. These families that lived along the levies, were going to lose their homes.

As a West Sacramento real estate consultant, resident, and friend of these families I am very concerned. As of today, there are over 300 families currently in default of their mortgage, is scheduled for auction or is bank owned. These do not include residents that have missed mortgage payments and have not yet had a notice of default filed. I work with West Sacramento residents in the short sale market and know of several homeowners in this situation and I am currently helping them in short selling their home.

Current market value for these homes, which I believe the city is going to pay, is not going to be enough for some of these homeowners. We have seen a dramatic decrease in the home values in West Sac. Bridgeway Lakes homes are currently being sold between $250k-$450k for the properties on the lake. These homes were once worth $600k-$850k. What is going to happen to these homeowners along the levy road when the city pays them off and they still have a mortgage balance AND have to buy another place to live? It isn't as easy as it used to be to secure a home for purchase. To ask these homeowners, that did nothing wrong but play by the rules, to take a low payout for their homes, move their belongings, watch their homes be destroyed, and enter this volatile housing market is WRONG.

The projects that save EVERYONES' home needs to be considered and put in place. West Sacramento has already lost many residents and businesses due to the downturn of the economy. We can't lose our long term residents and they can't lose their homes and land. The army corps of engineers need to implement the option that allows EVERYONE along the River road to stay in their homes.

If you need any further information regarding market trends, analysis of homeowners in West Sac currently in foreclosure, default, etc. Please contact me! Thank you!

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From: Eric Fredericks
To: southportcomments
Cc: Arthur Murray
Subject: Request Extension for Southport Sacramento River Early Implementation Project Comments
Date: Monday, September 26, 2011 4:13:24 PM

Hello,

Caltrans would like to request an extension for comments on the NOP for the Southport Sacramento River Early Implementation Project. We anticipate being able to deliver a comment letter within the next 2-3 days if that is ok.

Thanks for your consideration,

Eric

--
Eric Fredericks
Chief, Office of Transportation Planning - South
Caltrans District 3
Sacramento Area Office
Desk (916) 274-0635
Email: eric_fredericks@dot.ca.gov

September 26, 2011

Mr. John Suazo
U.S. Army Corps of Engineers, Sacramento District
Attn: Planning Division (CESPK-PD-R)
1325 J Street
Sacramento, CA 95814

Megan Smith, Project Manager
ICF International
630 K Street, Ste. 400
Sacramento, CA 95814

RE: Scoping Comments for EIS/EIR for the Southport Sacramento Early Implementation Project

Dear Mr. Suazo and Ms. Smith,

Thank you for the opportunity to provide scoping comments on WSAFCA's Southport Early Implementation Project. We understand the opportunity and the importance of the proposed levee project and share WSAFCA's interest in protecting and restoring riparian forests along the levees for both habitat and public recreation purposes.

Defenders of Wildlife (Defenders) is a national non-profit organization with a field office in Sacramento, California. Defenders is dedicated to the protection of all native wild animals and plants in their natural communities.

Friends of the River (FOR) was founded in 1973 and is dedicated to the protection, preservation, and restoration of California's rivers, streams, watersheds, and aquatic ecosystems. FOR has been involved in activities to protect and restore the Sacramento and San Joaquin Rivers and their tributaries for more than 30 years.

Our most urgent concern with the Southport Early Implementation Project is the difficult relationship it has with the Army Corps of Engineers' (Corps) Levee Vegetation Policy. We appreciate WSAFCA's obvious interest in retaining vegetation on and near its waterways—and have some understanding of the difficulties it will face attempting to reconcile the two potentially conflicting goals.

We offer these comments to help WSAFCA and the Corps adequately define the appropriate scope of the environmental review required in the EIS/EIR.

Cumulative Impacts Analysis is Required

When the Corps changed its policy to require the removal of vegetation on levees, they did not, per the requirements of NEPA, complete a programmatic EIS to analyze the

environmental implications of changing this policy. A programmatic EIS should have contained an analysis of the cumulative impacts of implementing the new vegetation removal policy nationwide. Cumulative impacts analyses are important because they provide necessary information to understand how a specific project and its impacts fit into a wider environmental picture. Because no programmatic EIS was completed, there is no baseline of environmental information for this project to tier off of and as such, it is impossible to truly and adequately understand the wider environmental implications of this project. Such analysis, by law, was required to have been done in writing in an EIS or at least an EA, but the Corps prepared no such document under NEPA prior to changing its policy on levee vegetation.

Without a programmatic evaluation and a cumulative impacts analysis, the project specific EIS/EIR will be inadequate. At a minimum, the Corps should perform a cumulative impacts analysis to assess the environmental impacts of implementing its vegetation removal policy throughout California. Preferably, the Corps will perform a programmatic EIS to evaluate the cumulative impacts of its policy nationwide. Until such a review has been completed, it is our view that any project specific EIS will be deficient and the required implementation of the vegetation removal policy is illegal.

Corps' Vegetation Removal Policy Cannot be a "Given"

The Corps posted its "Literature Review-Vegetation on Levees" prepared by the Corps' Engineer Research and Development Center on its web site on about July 26, 2011. Among the conclusions were, "Both benefits and risks of converting wooded levees to grass-covered levees, including the engineering feasibility and economic costs of such conversion, have yet to be fully investigated." (Summary, p. 16).

The Corps posted its "Initial Research into the Effects of Woody Vegetation on Levees" prepared by the Corps' Engineer Research and Development Center" on its web site on about September 8, 2011. Among the conclusions of the study was that: "Because of the extreme variability in geology, tree species, climate, and soils, the impact of trees on levees must be analyzed on a case-by-case basis." (Vol. 4, Summary at p. 29). Also, "Results indicated that a tree can increase or decrease the factor of safety with respect to slope stability depending on the location of the tree on the levee." (Id.).

Unless the Corps withdraws its guidance requiring the removal of vegetation including ETL 1110-2-571, an EIS is required to address vegetation removal including possible risks to levees and thus public safety of removal of vegetation from levees as well as other environmental consequences of vegetation removal ranging from loss of essential habitat for endangered species to destruction of the aesthetics of tree-lined rivers. Corps vegetation removal guidance including the concept of "non-compliant vegetation" cannot lawfully be accepted as a "given" because it was adopted in the absence of preparation of an EIS as set forth above.

ESA Consultation is Required

The trees and shrubs on California's levees, including those in the Southport Early Implementation Project, represent the last remaining 5% of riparian habitat left in the state. As such, even small numbers of trees and shrubs are critically important to many threatened and endangered species including Swainson's Hawk, Valley Elderberry Longhorn Beetle, and salmon and steelhead.

Section 7 of the Endangered Species Act requires agencies to consult with the appropriate wildlife agency to ensure that any action it authorizes (such as the removal of vegetation on

levees) is not likely to jeopardize the continued existence of an endangered or threatened species. The Corps failed to initiate and complete consultation with wildlife agencies, the FWS and NMFS as required by the ESA, 16 U.S.C. § 1536(a)(2), prior to requiring the removal of levee vegetation that provides habitat essential to a number of endangered species. The Corps, like all federal agencies, must comply with the regulations promulgated by the FWS and NMFS, 50 C.F.R. §402.03, which provide that "Section 7 [of the ESA] and the requirements of this part apply to all actions in which there is discretionary Federal involvement or control."

The Corps must undertake Section 7 consultation with FWS and NMFS to determine whether there are impacts to species from the removal of vegetation on levees. Similarly, the project-specific EIS/EIR must evaluate the likely impacts to threatened and endangered species and their habitat from the various project alternatives.

Vegetation on Levees Should be Preserved

California once had vast riparian forests in the great Central Valley along the Sacramento and San Joaquin Rivers, their tributaries and in the Delta. Since the arrival of Europeans and the beginning of modern development including gold mining in the mid-nineteenth century, intensive agricultural and urban development, and enormous population growth, about 95% of the riparian forests have vanished from the Central Valley. There have also been enormous losses of riparian forest in other parts of the State ranging from the Bay Area to Southern California.

For decades the Corps has allowed, encouraged, and in many situations required the maintenance and planting of trees and shrubs on California levees. Because of the loss of about 95% of the riparian forest in California, the trees and shrubs on and within 15 feet of the levees constitute most of the remnant 5% or so of the riparian forest. This surviving remnant of the riparian forest is of critical importance as vital habitat for fish, birds, and animals including endangered species, as well as for shade, scenic beauty, aesthetics, and recreational enjoyment by residents, drivers, boaters, swimmers, fishermen, motorcyclists, bicyclists, joggers, walkers, bird watchers and other recreational users and nature enthusiasts. For example, enjoyment of the scenic beauty afforded by tree-lined rivers is close, affordable, and open to all including those residents of such cities as Sacramento and West Sacramento who would find it difficult or impossible to travel to more distant locations to experience natural outdoor scenic beauty.

It is our collective position that the Corps' vegetation removal policy should not be implemented and that the vegetation should be allowed to remain on the levees.

Alternatives Analysis

The heart of an EIS is the alternatives analysis. WSAFCA must rigorously explore and objectively evaluate all reasonable alternatives. Preserving existing vegetation on the levees should be a top consideration for each of the alternatives proposed for evaluation. The alternatives analysis should also address whether so-called "non-compliant vegetation" enhances or imperils levee integrity and analyze the environmental consequences of denuding a levee of its trees and shrubs.

Additionally, in instances where retaining levee vegetation is not possible, the EIS/EIR should clearly explain and evaluate various options for mitigating lost vegetation. The alternatives analysis should also seek to answer the following questions: How many trees would be lost in each alternative? What impacts would the loss of habitat cause on birds, animals, and fish? Which of the impacted species are threatened or endangered and what is the best way to mitigate impacts to these species? What are the effects of lost vegetation on property values and the aesthetic and recreational values provided by the levees?

Finally, we propose the addition of a pure "fix in place" alternative. While there is too little information to endorse a specific alternative, we feel that a "fix in place" alternative would provide a necessary book-end to the analysis and yield helpful information on the relative merits of all of the alternatives being considered. The EIS/EIR should thoroughly develop a "fix in place" alternative which would save vegetation except where a site-specific case by case analysis demonstrates the need to remove a particular tree and which would also avoid some of the impacts on aesthetics and private property owners inherent in the other alternatives proposed for analysis. We think a thorough analysis of a "fix in place" alternative will help WSAFCA clearly and thoroughly articulate why whichever alternative is chosen as the preferred alternative is the superior alternative.

Additional Comment on Meeting Notice

While this is not particularly germane to the scoping of the EIS/EIR, we feel compelled to provide a word of caution. On the September 22, 2011, we received a save the date notification for the Southport EIP Environmental Agency-NGO Stakeholders meeting #3. The notice states that Item 2 on the preliminary agenda for Meeting #3 will be: "Presentation of two design alternatives that will go before the WSAFCA Board in December for authorization to proceed in the detailed design process." We are unsure what "detailed design process" means. If the term "detailed design process" means construction-level (rather than NEPA/CEQA-alternative design level), then please note that none of the NEPA or CEQA processes ranging from scoping, to the draft EIS/EIR and public review and comment stage, or final NEPA and CEQA process have been completed. There are no draft scoping or later stage environmental documents available for review. It seems premature to narrow down the alternatives to only two this early in the process. We believe that at this time there should be a minimum of three or more reasonable alternatives to consider and evaluate, not including the always required no-project alternative.

Again, thank you for the opportunity to provide scoping comments on the Southport Early Implementation Project. We look forward to working with you to provide a robust environmental analysis and to reviewing the draft EIS/EIR.

Sincerely,

Kelly Catlett, J.D.
Defenders of Wildlife

Ronald Stork
Friends of the River

From: NC
To: southportcomments; john.suazo@usace.army.mil; kljsv@aol.com; MChase@boutinjones.com; Heather Vierra
Subject: Southport Levee Project
Date: Monday, September 26, 2011 9:18:40 PM

September 26, 2011

West Sacramento Area Flood Control Agency and
Mr. John Suazo U.S. Army Corps of Engineers

To Whom It May Concern:

This letter addresses the proposal of the Southport Sacramento River Early Implementation Project and how this project will affect the owners of the homes and farm lands within this 6 mile levee area. First and foremost it was stated that all residents east of Jefferson Blvd. in the 6 mile levee area were notified by mail of the project intent. This is not true. Many residents received nothing in the mail and have no knowledge of this project.
The few notices that were mailed out gave very little time for any meaningful fact finding and informational gathering. Additionally the time given to respond with comments was extremely short. Given the fact that the loss of our homes and land are being threatened, more notice and time to evaluate this should certainly be given.

These homes and farmlands are irreplaceable. These are five generation farms and farming families. One home in particular, the old Houglan home at 4400 South River Road was built by one of these farming families in 1904.

Flood control is important. However, there are ways of doing this without taking these homes and important farmlands. Throughout the two meetings and within the few notices that were mailed out references were continually made to "habitat establishment and recreational opportunities" this project would create. Much of the proposed land to be taken from the owners of these properties is to be devoted to these uses. When have recreational pursuits and habitat become more important than fertile farmlands and the families who have toiled for generations to establish these these farms?

The levees along the American River and the levee on the Sacramento County side have been shored up and improved without taking people's homes and property. Why are we being handled differently? Is it because there are so few of us compared to those above mentioned projects? The condos just south of the locks and at the beginning of South River Road are just 80 feet from the very levee we are discussing and they are not being removed, destroyed or threatened. Why? The CHP academy along the levee north of Bryte is not being removed. Why? However, we have been informed to get ready to give up our homes and family farms. This smacks of special treatment and special interests.

We ask that more time is given to the owners of these properties to gather information. We are confident that there are ways to improve these levees without destroying some of the most important parts of West Sacramento's historical farms and homes. Make no mistake, our homes and property will not be taken from us without a fight.

All the following are in complete agreement of this letter:

1) Ken and Nancy Conley
4610 South River Road
West Sacramento, CA. 95691

2) David Vierra
4610 South River Road
West Sacramento, CA. 95691

3) Richard and Karen Vierra
908 Woodlake Lane
Roseville, CA. 95661

4) Heather Vierra
2668 Crystal Court
West Sacramento, CA. 95691

5) Gary Gaunt
2998 Diane Court
West Sacramento, CA. 95691

6) John and Karen Vierra
2515 Davis Road
West Sacramento, CA. 95691

From: Philip Carson
To: southportcomments
Subject: SPARING HOMES EVEN WITH LEVEE IMPROVEMENTS IN SOUTHPORT, WEST SAC.
Date: Monday, September 26, 2011 6:58:05 PM

As a relatively new neighbor in the Southport area of West Sacramento, I am concerned about families losing their homes and land to levee improvements. I am not against levee improvements per se as there are several options that the engineers can take that would spare EVERYONE their home. Please take these kinds of options that spare the folks their homes. Indeed, how would you feel if you were in their shoes through no fault of your own, as they are! Do the sensible thing, the reasonable alternative! Set a good example!
Regards,
Philip Carson,
West Sacramento resident

From:	Smith, Megan
To:	southportcomments
Subject:	FW: Southport Sacramento River EIP (UNCLASSIFIED)
Date:	Tuesday, September 27, 2011 8:51:32 AM
Attachments:	Southport Sac River EIP.pdf OLD WSLIP NOI ltr.pdf

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-----Original Message-----
From: Suazo, John SPK [mailto:John.Suazo@usace.army.mil]
Sent: Tuesday, 27 September 2011 7:45 AM
To: Smith, Megan
Subject: FW: Southport Sacramento River EIP (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

-----Original Message-----
From: Kelly.ThomasP@epamail.epa.gov [mailto:Kelly.ThomasP@epamail.epa.gov]
Sent: Monday, September 26, 2011 5:06 PM
To: Suazo, John SPK
Subject: Southport Sacramento River EIP

John,
Here's our comments on the NOI. The second letter (our comments on the earlier NOI) is an enclosure for the first letter. Feel free to give me a
call if you have questions.

Tom Kelly
Environmental Review Office (CED-2)
U.S. EPA
75 Hawthorne St.
San Francisco, Ca 94105

Phone: (415) 972-3856

Classification: UNCLASSIFIED
Caveats: NONE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

September 26, 2011

Mr. John Suazo
U.S. Army Corps of Engineers
Sacramento District,
Attn: Planning Division (CESPK-PD-R)
1325 J Street, Sacramento, CA 95814

Subject: Notice of Intent to Prepare a Draft Environmental Impact Statement (DEIS)/Draft Environmental Impact Report on the Section 408 Permission for the Southport Sacramento River Early Implementation Project (EIP), Yolo County California

Dear Mr. Suazo:

The U.S. Environmental Protection Agency (EPA) is providing comments on the Federal Register Notice published August 26, 2011 requesting comments on the subject action. Our comments are provided pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

We participated as a cooperating agency on the West Sacramento Levee Improvement Program (WSLIP), California Highway Patrol Academy and the Rivers Early Implementation Projects (EIPs). EPA appreciates the Corps cooperation on the previous project and encourages review of our comment letters on Highway Patrol and Rivers EIPs. We provide the following comments as a supplement to our earlier Notice of Intent comments, which we have enclosed with this letter.

Existing Conditions
The DEIS should clearly describe the existing conditions of the Southport Sacramento River levees. The DEIS should include the age, design elements, construction techniques, underlying geologic strata and other readily obtainable relevant information about the current levees. The DEIS should also include specific information on existing land use, the number and type of structures (both existing and if appropriate planned structures) to be protected by the levees, flood control practices, biological resources (e.g., threatened and endangered species, wetlands and riparian areas, sensitive or unique resources).

Alternatives Analysis
The DEIS should include a thorough analysis of setback levees. An estimated 95% of riparian habitat has been lost along the Sacramento River due to wood harvest, flood control, conversion to agriculture, and urban development. Setback levees offer an opportunity to restore habitat. While setback levees are not possible at many locations around West Sacramento, the Southport Sacramento Levee EIP does present this opportunity. Additionally, levees built along the edge of California rivers often overlie material that may be inappropriate for levee construction, such as

alluvial deposits. The expense of retrofitting poorly constructed and poorly located levees to meet federal and state standards may improve the financial viability of setback levees.

Addressing Residual Flood Risk

As recommended by the National Association of Flood Plain Managers, the design of levees should include improved methods of providing resiliency. Specifically, fail-resistant spillways built into levees so that when the levee design is exceeded, excess flow spills through that area, preventing catastrophic overtopping or failure of the structure.

The National Association of Flood Plain Managers also recommend communication of the residual risk behind levees on a regular basis. The communication should be an explicit component of all aspects of proposed and current levee activities. It should include notification to all property owners of the risk (e.g. notice in annual water bill, tax bill, or notice in the property deed) along with other measures such as posting signs in all land areas at risk behind the levees. All communication should clearly describe the level of protection provided by levees, that the levees may fail or be overtopped, and that the area is a floodplain, with indications of the depth of flooding when the levee fails or is overtopped. Communication to the property owners should also provide clear information on their role if an evacuation is ordered.

As recommended by the Corps, the National Association of Flood Plain Managers, and the National Association of Flood and Stormwater Agencies[1], "residual risk areas behind levees should be mapped and the purchase of flood insurance required for structures in that area."

Cumulative Impacts

Levee projects often induce growth such as housing development. The DEIS should describe the reasonably foreseeable future land use changes and the associated impacts that will result from the additional flood protection. The document should provide an estimate of the amount of growth and the likely location.

Borrow Sources

The DEIS should describe the source for borrow material and the certification process for assuring the material is free of contaminants. Should this project occur after the Corps' Sacramento River Deep Water Ship Channel Project, we suggest consideration of the channel's dredged material for levee construction.

Health Impacts

In addition to the environmental health risks posed by the project, EPA encourages the Corps and project proponent to remain focused on seeking recreation opportunities for local residents. As recommended in the recent National Academy of Sciences study[2], the DEIS should include a description of relevant baseline health conditions for the community as well as an analysis of the project's impacts.

---

[1] See http://www.nfrmp.us/docs/FinalASFPM-NAFSMAJoinSummittRecc.pdf

[2] Improving Health in the United States: The Role of Health Impact Assessment, September 2011, National Research Council of the National Academy of Sciences (Note: Appendix F summarizes Analysis of Health Effects under the National Environmental Policy Act.)

We appreciate the opportunity to review this Notice of Intent. When the DEIS is released for public review, please send one hard copy and one electronic copy to the address above (mail code: CED-2). If you have questions, please contact me at (415) 972-3856 or kelly.thomasp@epa.gov.

Sincerely,

Tom Kelly

Tom Kelly
Environmental Review Office
Communities and Ecosystems Division

cc: Megan Smith, ICF International
Central Valley Flood Protection Board, Sacramento
Central Valley Regional Water Quality Control Board, Rancho Cordova
Federal Emergency Management Agency, San Francisco
U.S. Fish and Wildlife Service, Sacramento
National Marine Fisheries Service, Santa Rosa

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

February 26, 2009

Mr. Brian Buttazoni
U.S. Army Corps of Engineers
Sacramento District
Attn: Planning Division (CESPK-PD-RA)
1325 J Street
Sacramento, CA 95814-2922

Subject: Scoping Comments for 408 Permission to the Central Valley Flood Protection Board and 404 Permit to the West Sacramento Area Flood Control Agency for the West Sacramento Levee Improvements Program, Yolo and Solano Counties, California

The U.S. Environmental Protection Agency (EPA) has reviewed the Federal Register Notice published January 27, 2009 requesting comments on the U.S. Army Corps of Engineers (COE) decision to prepare a programmatic and project-specific Draft Environmental Impact Statement (DEIS) for the above action. Our comments are provided pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

The COE will consider granting both 408 permission to the Central Valley Flood Protection Board (CVFPB) and a 404 permit to the West Sacramento Area Flood Control Agency (WSAFCA) for their proposed West Sacramento Levee Improvements Program (WSLIP). The WSLIP would address identified levee deficiencies in order to provide a 200-year level of flood protection for the entire City of West Sacramento by improving 50 miles of levees that protect it. Recreational and open space elements that are compatible with flood improvement actions are included in the program. Three sites - CHP Academy Site, The Rivers Site, Sac Bank Extension Site – would be analyzed at a project-specific level in this DEIS.

EPA acknowledges the need for reliable flood protection for the highly urbanized West Sacramento area. We remain concerned with the residual flood risk to development in a deep floodplain protected by levees. We recommend implementing a flood safety plan, if not already in place, as part of the effort to reduce flood risks and prior to approval of additional major development. We also recommend the DEIS describe how WSAFCA and its members will ensure development does not compromise the flood-damage-and-risk-reduction achievements of the WSLIP nor constrain effective flood protection management.

We recommend the DEIS include a clear description of past, present, and proposed West Sacramento flood protection and development projects in order to place the proposed WSLIP within the context of regional land use planning and floodplain and flood control management.

At a minimum, describe the interplay, if any, between the WSLIP and the Sacramento River Bank Protection Project, American River Water Forum Agreement, and flood control and restoration projects on the Sacramento River (e.g. Yolo Bypass, Natomas Levee Improvement Project).

We are also concerned that potential climate change may alter the intensity, timing, and volume of storm and rain events, posing additional challenges in providing reliable flood protection for the area. Other EPA concerns include effects on water quality, changes in channel alignment and hydraulics, air quality, effects on riparian and oak habitat, and potential effects on anadromous fish and other sensitive species.

It is our understanding that the methods for determining flood risk, appropriate flood protection levels, and management of levee vegetation, have been evolving over the years. The DEIS should provide a detailed description of the current Federal Emergency Management Agency (FEMA) floodplain management and insurance regulations, the FEMA and COE flood risk assessment for the West Sacramento area, and COE levee vegetation management policies.

We appreciate the opportunity to review this NOI. Detailed general scoping comments are enclosed for your information. When the DEIS is released for public review, please send one hard copy and one CD to the address above (mail code: CED-2). If you have questions, please contact me at (415) 972-3852 or fujii.laura@epa.gov.

Sincerely,

Laura Fujii

Laura Fujii
Environmental Review Office
Communities and Ecosystems Division

Enclosure: Detailed Comments

cc: Central Valley Flood Protection Board, Sacramento
Michael Bessette, West Sacramento Area Flood Control Agency
John Powderly, City of West Sacramento
Central Valley Regional Water Quality Control Board, Rancho Cordova
Federal Emergency Management Agency, San Francisco
U.S. Fish and Wildlife Service, Sacramento
National Marine Fisheries Service, Santa Rosa

EPA DETAILED SCOPING COMMENTS FOR 408 PERMISSION TO THE CENTRAL VALLEY FLOOD PROTECTION BOARD AND 404 PERMIT TO THE WEST SACRAMENTO AREA FLOOD CONTROL AGENCY FOR THE WEST SACRAMENTO LEVEE IMPROVEMENTS PROGRAM, YOLO AND SOLANO COUNTIES, CALIFORNIA, FEBRUARY 26, 2009.

National Environmental Policy Act

EPA recommends the Draft Environmental Impact Statement (DEIS) include a clear description of the basic project purpose and need, project alternatives, potential impacts to the environment, and mitigation for these impacts. Particular attention should focus on an evaluation of the environmental impacts of the proposal and alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options for the decision maker and the public (40 CFR 1502.14). In addition, NEPA requires evaluation of indirect and cumulative effects which are caused by the action (40 CFR 1508.8(b) and 1508.7).

Existing Conditions

The DEIS should clearly describe the existing conditions of the levees for the City of West Sacramento. Include specific information on existing land use, flood control practices, biological resources (e.g., threatened and endangered species, wetlands and riparian areas, sensitive or unique resources), and unresolved erosion management and flood protection issues and needs.

Alternatives Analysis

We recommend consideration of ideas provided by the public and of reasonable alternatives not within the jurisdiction of the lead agency (40 CFR Section 1502.14(c)). There should be a clear discussion of how each alternative was developed and the reasons for the elimination of alternatives not evaluated in detail. We recommend developing a range of alternatives which bracket any potential bank protection and levee setback alternatives.

Cumulative Impacts

The DEIS should include a section evaluating potential cumulative impacts of all direct, indirect, and reasonably foreseeable future projects. This section should describe the process used to evaluate cumulative effects. Of specific interest would be potential cumulative impacts to special aquatic sites, air quality, water quality, water supply, anadromous fish, and threatened, endangered and sensitive species and their habitat. For instance, describe how the proposed levee improvements will affect other projects on the Sacramento River, Yolo Bypass, and Deep Water Ship Channel.

Water Quality

1. The DEIS should briefly discuss how the proposed levee improvements program will comply with State and local water quality management plans and State-adopted, EPA-approved water quality standards. Provide information on how the project will assure compliance with the State nonpoint source pollution program. EPA recommends that the project proponents fully coordinate with the appropriate Regional Water Quality Control Board to ensure protection of water quality and maintenance of beneficial uses.

2. In addition, the DEIS should fully disclose potential beneficial and/or adverse impacts to water quality, wetlands, and aquatic ecosystems. The discussion should include an evaluation of potential impacts on existing fisheries, especially the threatened and endangered Chinook salmon. Include information on:

- The potential of the proposed project to cause beneficial and/or adverse aquatic impacts such as increased siltation and turbidity; changes in the direction of stream flow, substrate, dissolved oxygen, and temperature; and habitat deterioration.
- Critical fish habitat, especially spawning and rearing areas; and other sensitive aquatic sites such as wetlands. Outline past and potential beneficial uses of these areas, and disclose potential impacts from the proposed levee improvement activities.

3. Discuss specific monitoring programs that will be implemented before and after proposed levee improvement actions to determine potential impacts on water quality and beneficial uses, and whether maintenance and protection of water quality is being guaranteed.

Wetlands: Section 404 Comments

We recommend that the DEIS include a separate section addressing compliance with Section 404 of the Clean Water Act and potential impacts to special aquatic sites (e.g., wetlands, open water, marshes, riparian woodlands). This section should identify Section 404 Clean Water Act requirements, underlying assumptions and conclusions, and management and mitigation proposals to ensure compliance with these requirements.

EPA will review the proposed action for compliance with the Federal Guidelines for Specification of Disposal Sites for Dredged or Fill Materials (40 CFR 230) [hereafter referred to as the Guidelines], promulgated pursuant to Section 404(b)(1) of the Clean Water Act (CWA). To comply with the Guidelines, the proposed actions must meet all of the following criteria:

- There is no practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem (40 CFR 230.10(a)).

- The proposed action does not violate State water quality standards, toxic effluent standards, or jeopardize the continued existence of federally listed species or their critical habitat (40 CFR 230.10(b)).

- The proposed action will not cause or contribute to significant degradation of waters of the United States, including wetlands (40 CFR 230.10(c)). Significant degradation includes loss of fish and wildlife habitat, including cumulative losses.

- All appropriate and practicable steps are taken to minimize adverse impacts on the aquatic ecosystem (i.e., mitigation) (40 CFR 230.10(d)). This includes incorporation of all appropriate and practicable compensation measures for unavoidable losses to waters of the United States, including wetlands. The DEIS should fully address the feasibility of "in-kind" habitat mitigation measures.

Mitigation

We recommend that the DEIS provide a clear and detailed description of proposed avoidance, minimization, and compensatory mitigation measures. Mitigation ratios for specific habitat types should be based upon science and recommendations from the U.S. Fish and Wildlife Service or National Marine Fisheries Service. Furthermore, the same mitigation ratios should be used for all alternatives.

Climate Change

The potential for climate change is now considered a significant possibility. Current research estimates that climate change could change the amount, timing, and intensity of rain and storm events. A significant change in the weather patterns of our region could have significant implications for water management and flood control facilities. We recommend that the DEIS include a chapter on climate change and its potential implications for flood control along the Sacramento River. For example, describe and address projected climate change effects--sea level rise, frequency of high intensity storms, amplified rain events--that could affect the Sacramento River levees and the timing or quantity of water requiring drainage to ensure an adequate level of flood protection for the City of West Sacramento.

Air Quality

The DEIS should provide a discussion of air quality standards, ambient conditions, and potential air quality impacts for the West Sacramento Levee Improvements Program. Describe the proposed construction activities and their impacts on air quality. Cumulative and indirect impacts should be fully evaluated.

Federal agencies are required by the Clean Air Act to assure that actions conform to an approved air quality implementation plan. If the proposed project area is in a nonattainment area, the COE may need to demonstrate compliance with conformity requirements of the Clean Air Act [Section 176(c)]. General Conformity Regulations can be found in 40 CFR Parts 51 and 93 (58 Federal Register, page 63214, November 30, 1993). These regulations should be examined for applicability to the proposed project.

Species Viability

The DEIS should describe measures that will be taken to protect critical wildlife habitat from potential adverse effects of the proposed levee improvement activities. The feasibility of proposed mitigation measures should be fully demonstrated.

Funding and Administration

The DEIS should provide full disclosure and discussion of funding, implementation, enforcement, and monitoring commitments, assurances, and mechanisms for the levee improvement proposal. Include a description of the current State/Federal cost-share policies. If this information (e.g., funding agreements) has been relegated to the appendices, we recommend it be summarized in the main body of the DEIS.

Environmental Justice

In keeping with Executive Order 12898, **Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations** (E.O. 12898), the DEIS should describe the measures taken by the COE to: 1) fully analyze the environmental effects of the proposed Federal action on minority communities, e.g. Indian Tribes, and low-income populations, and 2) present opportunities for affected communities to provide input into the NEPA process. The intent and requirements of E.O. 12898 are clearly illustrated in the President's February 11, 1994 Memorandum for the Heads of all Departments and Agencies, attached.

General Comments

1. The DEIS should describe the source for borrow material and the certification process for assuring the material is free of contaminants. Of concern is the potential for borrow material to be obtained from the Port of Sacramento dredge tailing disposal areas or other sources which may contain contaminated soils.

2. If references to previous documents are used, the DEIS should provide a summary of critical issues, assumptions and decisions complete enough to stand alone without depending upon continued referencing of the other documents.

Sun Capital, LLC
75 Malaga Cove, Suite 14
Palos Verdes Estates, CA 90274
Direct: 310-809-8898
E-mail: michaelsoffice@gmail.com

September 26, 2011

Megan Smith, Project Manager
ICF International
630 K Street, Suite 400
Sacramento, CA 95814

John Suazo
U.S. Army Corps of Engineers, Sacramento District
Attn: Planning Division (CESPK-PD-R) 1325 J Street
Sacramento, CA 95814

Re: Southport Sacramento River Early Implementation Project

Dear Megan Smith & John Suazo,

We own approximately 400 acres of the River Park project within West Sacramento. The majority of the project is within the Study Area of the Southport Sacramento River Early Implementation Project. The River Park project is a master planned community consisting of a variety of land uses including 2,280 Residential Units, Commercial, Marina, School and a Regional Park. The project is entitled, has vested rights and a signed development agreement.

We support an alternative bringing the levee up to State and Federal Standards which has the least impact to the future development of our project.

Please add us to the distribution list for the EIR and any other relevant correspondence.

Sincerely,

Michael Smith
Project Coordinator

From: Armer, Laurel
Sent: Tuesday, September 27, 2011 4:21 PM
To: Rivasplata, Robert
Cc: Smith, Megan; Rogers, Jennifer
Subject: FW: Phone communication logged for case 18780

Hi Robert,

Could you save, label and add this comment to the NOP scoping index?

Thank you!
Laurel

-----Original Message-----
From: Powderly, John [mailto:johnp@cityofwestsacramento.org]
Sent: Tuesday, September 27, 2011 4:18 PM
To: Elliott, Christopher; Matson, Tanya; Smith, Megan; Martin, Sara; Armer, Laurel; Rogers, Jennifer
Cc: Suazo, John SPK; Shpak, Dave
Subject: FW: Phone communication logged for case 18780

FYI - scoping-esque comments.

-----Original Message-----
From: daves@cityofwestsacramento.org [mailto:daves@cityofwestsacramento.org]
Sent: Monday, September 26, 2011 6:32 PM
To: Shpak, Dave; Hansen, Peter; Powderly, John
Subject: Phone communication logged for case 18780

I talked with Ms. Gould this evening. Her concerns fall into three categories: (1) Present experiences, (2) Motor vehicle behaviors, (3) Input to the evaluation of levee improvements.
1. Present experiences include:
- Trespassers across her property going to/from the Clarksburg Branch Line Trail, including quadrunners, walkers, joggers, hikers.
- Kids throwing rocks down from the trail to the roadway, shooting from the trail across the roadway, groups of strange men hanging around on the trail.
- They are reluctant to call the Police to report problems.
2. Motor vehicle behaviors include:
- Excess speed and poor navigation by motor vehicle operators at the transition curve between Gregory and South River Road.
- Increasing truck and commute traffic on South River Road to Gregory.
- Concerns about motocycle hazards caused by debris on the transition curve.
3. Input to the evaluation of levee improvements
- Will South River Road be on the new levee, abandonned or re-routed?
- Consider a staging facility for trail users in conjunction with levee improvements to discourage trespass across her property.

John, please convey her comments about present circumstances and input on levee consideration to the ICF team. I will convey the same content to HDR. This will close out the levee component of the inquiry, so I will transfer primary ownership back to Peter. Peter, please follow up on the motor vehicle concerns and communicate your findings with Ms. Gould. Many thanks. - Dave

For more information, click
https://clients.comcate.com/reps/caseDetail.php?ag=103&id=401771

DEPARTMENT OF TRANSPORTATION
DISTRICT 3—SACRAMENTO AREA OFFICE
2379 GATEWAY OAKS DRIVE, SUITE 150
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FAX (916) 274-0602
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September 28, 2011

0311YOL0027
03-YOL-84 PM 15.8
Southport Sacramento River Early Implementation Project
Notice of Preparation Environmental Impact Statement/Environmental Impact Report

Megan Smith, Project Manager
ICF International
630 K Street, Suite 400
Sacramento, CA 95814

Dear Ms. Smith,

Thank you for the opportunity to review and comment on the Notice of Preparation for the Environmental Impact Statement (EIS) and Environmental Impact Report (EIR) for the Southport Sacramento River Early Implementation Project. The proposed project will implement flood risk-reduction measures at the proposed project site which spans the west bank of the Sacramento River beginning south of Barge Canal near the intersection of State Route (SR) 84 and South River Road to downstream approximately 6.4 miles to the South Cross Levee near the intersection of SR 84 and South Levee Access Road. The South Cross levee is to protect the Southport community from the threat of flooding. The United States Army Corps is the Federal lead agency under the National Environmental Policy Act. The West Sacramento Area Flood Control Agency is the lead agency under the California Environmental Quality Act. Our comments are as follows:

- Caltrans requests project proponents prepare a Traffic Management Plan (TMP) for the movement of materials to and from the project site during construction of the project as part of the Draft EIR. The TMP should include a schedule of material deliveries and proposed routes. Caltrans recommends that trucks avoid the use of State facilities during peak commute hours. The TMP should be circulated to Caltrans and shared with all potentially impacted jurisdictions.

- If any project related work will take place in the State Highway System's right of way, then a Caltrans encroachment permit would be required.

Please provide our office with copies of any further actions regarding this development. If you have any questions regarding these comments please contact Arthur Murray, Yolo County Inter-Governmental Review Coordinator, at (916) 274-0616.

Sincerely,

Eric Fredericks

ERIC FREDERICKS, Chief
Office of Transportation Planning - South

From:	Arthur Murray
To:	southportcomments; Smith, Megan
Cc:	Eric Fredericks
Subject:	Southport Sacramento River Early Implementation Project Contact
Date:	Wednesday, September 28, 2011 10:53:49 AM
Attachments:	0311YOL0027 Southport SREI-project comments-nobc.pdf

---

Dear Megan Smith/Southport Sacramento River Early Implementation Project Contact,

Thank you for the opportunity to review the Notice of Preparation (NOP) for the Southport Sacramento River Early Implementation Project Notice of Preparation of Environmental Impact Report (EIR) / Environmental Impact Study (EIS) SCH# 201182069.

Attached is a copy of our comment letter and the signed original has been mailed to your office. Please do not hesitate to contact me, Yolo County Inter-Governmental Review Coordinator at (916) 274-0616, for any questions in regards to this review.

Thanks and good day,

ARTHUR MURRAY
Desk: (916) 274-0616
Fax: (916) 274-0602

Caltrans - District 3
Division of Planning and Local Assistance
Office of Transportation Planning-South
2379 Gateway Oaks Drive Ste. 150
Sacramento, CA 95833
(See attached file: 0311YOL0027 Southport SREI-project comments-nobc.pdf)

STATE OF CALIFORNIA EDMUND G. BROWN JR., *Governor*

CALIFORNIA STATE LANDS COMMISSION
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202

CURTIS L. FOSSUM, *Executive Officer*
(916) 574-1800 FAX (916) 574-1810
California Relay Service From TDD Phone **1-800-735-2929**
from Voice Phone **1-800-735-2922**

Contact Phone: **(916) 574-1890**
Contact FAX: **(916) 574-1885**

September 26, 2011

File Ref: SCH # 2011082069

Megan Smith, ICF International
I/C of West Sacramento Area Flood Control Agency
630 K Street, Suite 400
Sacramento, CA 95814

Subject: Notice of Preparation (NOP) for an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Southport Sacramento River Early Implementation Project (EIP), Yolo County

Dear Ms. Smith:

The California State Lands Commission (CSLC) staff has reviewed the subject NOP for an EIS/EIR for the Southport Sacramento River EIP (Project), which is being prepared by the West Sacramento Area Flood Control Agency (WSAFCA) and the U.S. Army Corps of Engineers (USACE). WSAFCA, as a public agency proposing to carry out a project, is the lead agency under the California Environmental Quality Act (CEQA) (Pub. Resources Code § 21000 et seq.), and the USACE, as the primary federal permitting agency, is the lead agency under the National Environmental Policy Act (NEPA) (42 U.S.C. § 4321 et seq.). The CSLC will act as a trustee agency because of its trust responsibility for projects that could directly or indirectly affect sovereign lands, their accompanying Public Trust resources or uses, and the public easement in navigable waters. Additionally, if the Project involves work on sovereign lands, the CSLC will act as a responsible agency.

CSLC Jurisdiction and Public Trust Lands

The CSLC has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. The CSLC also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (Pub. Resources Code §§ 6301, 6306). All tidelands and submerged lands, granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the Common Law Public Trust.

As general background, the State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable lakes and waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all people of the State for statewide Public Trust purposes, which include but are not limited to waterborne commerce, navigation, fisheries, water-related recreation, habitat

preservation, and open space. On tidal waterways, the State's sovereign fee ownership extends landward to the mean high tide line, except for areas of fill or artificial accretion or where the boundary has been fixed by agreement or a court. On navigable non-tidal waterways, including lakes, the State holds fee ownership of the bed of the waterway landward to the ordinary low water mark and a Public Trust easement landward to the ordinary high water mark, except where the boundary has been fixed by agreement or a court. Such boundaries may not be readily apparent from present day site inspections.

Flood protection measures to be considered in the EIS/EIR appear to include the possibility of work waterward of the ordinary high water mark of the Sacramento River, which is State-owned sovereign land under the jurisdiction of the CSLC. A lease and formal authorization for the use of sovereign land will be required from the CSLC for any portion of the project encroaching on State-owned lands.

The CSLC supports siting projects consistent with the Public Trust, such as public safety, ecosystem recreation and recreation, on State lands; however, the CSLC is also responsible for ensuring that such projects avoid or minimize impacts to other Public Trust resources and uses including but not limited to navigation and public access. In the interest of all Public Trust values of the sovereign land at the Sacramento River, CSLC staff offers the following comments and will continue to participate in the development of the EIS/EIR.

Project Description

As described in the NOP, WSAFCA proposes to implement flood risk-reduction measures on the uplands and along the west bank of the Sacramento River in West Sacramento. The Project would meet WSAFCA's objectives as follows:

- Bring the levee up to standard with Federal and State flood protection criteria; and
- Provide opportunities for ecosystem restoration and public recreation.

CSLC staff understands that the Project could include some or all of the following components:

- Slope flattening of the existing levee;
- Use of seepage berms and/or stability berms on the land side of the levee,
- Rock slope protection on the water side of the levee;
- Setback levees and/or adjacent levees located landward of the existing levee;
- Relief wells; and
- Slurry cut-off wells.

Secondary activities that support these primary Project components could include:

- Use of neighboring roadways for project ingress and egress;
- Creation of temporary access roads;

- Construction of new roadways, including elevated spans;
- Resurfacing and/or relocation of existing roadways;
- Extraction of soil from identified borrow sites;
- Disposal of excess soil at identified disposal sites; and
- Relocation of public utilities.

Environmental Review

CSLC staff requests that the following be considered in the preparation of the EIS/EIR:

Project Description

1. From the NOP, it appears that the EIS/EIR will analyze a variety of flood control methods, some or all of which would be integrated into the Project's final design. A thorough and complete Project Description should be included in the EIS/EIR in order to facilitate meaningful environmental review of potential impacts, mitigation measures, and alternatives for all of the methods under consideration. The Project Description should be as precise as possible in describing the details of all allowable activities (e.g., types of equipment or methods that may be used, maximum area of impact or volume of sediment removed or disturbed, seasonal work windows, locations for material borrow or disposal, etc.), as well as the details of the timing and length of activities. Thorough descriptions will facilitate CSLC staff's determination of the extent and locations of its leasing jurisdiction, make for a more robust analysis of the work that may be performed, and minimize the need for subsequent environmental analysis.

Biological Resources

2. Sensitive Species: WSAFCA should conduct queries of the California Department of Fish and Game's (DFG) California Natural Diversity Database (CNDDB) and U.S. Fish and Wildlife Service's (USFWS) Special Status Species Database to identify any special-status plant or wildlife species that may occur in the Project area. Additionally, WSAFCA should consult early in the process with appropriate staff at DFG to identify species of concern. For example, the Sacramento River is known to provide habitat for delta smelt, Chinook Salmon, and steelhead, all of which are listed under the State and/or Federal Endangered Species Acts. These species could be impacted by loss of habitat or habitat complexity, increased siltation, or stranding during the installation or removal or cofferdams. The loss of natural, shaded streamside habitat for fish that contains riffles, natural woody debris, and other complex features due to the placement of rip rap or other unnatural bank stabilization should be evaluated and minimization or mitigation measures developed. The State-listed Swainson's hawk is also known to nest along the River, and if present in the Project area, could be impacted by tree removal and construction-related disturbance. The EIS/EIR should analyze the potential for such species to occur in the Project area and, if impacts to special-status species are found to be significant, identify feasible

mitigation measures, such as restricting work during certain time periods, establishing buffers, and restoring or compensating for lost habitat.

3. Invasive Species: One of the major stressors in Sacramento-San Joaquin Delta system (Delta) is introduced species. Therefore, the EIS/EIR should consider the Project's potential to encourage the establishment or proliferation of aquatic invasive species (AIS) such as the quagga mussel, or other nonindigenous, invasive species including aquatic and terrestrial plants. For example, construction boats and barges brought in from long stays at distant projects may transport new species to the Project area via hull biofouling, wherein marine and aquatic organism attach to and accumulate on the hull and other submerged parts of a vessel. If the analysis in the EIS/EIR finds potentially significant AIS impacts, possible mitigation could include contracting vessels and barges from nearby, or requiring a certain degree of hull-cleaning from contractors. The DFG's Invasive Species Program could assist with this analysis as well as with the development of appropriate mitigation (information at http://www.dfg.ca.gov/invasives/).

   In addition, in light of the recent decline of native pelagic organisms and in order to protect at-risk fish species, the EIS/EIR should examine if any elements of the Project (e.g., changes in bankside vegetative cover) would favor non-native fisheries within the Delta.

4. Construction Noise: The EIS/EIR should also evaluate noise and vibration impacts on fish and birds from construction, restoration or flood control activities in the water, on the levees, and for land-side supporting structures. Mitigation measures could include species-specific work windows as defined by DFG, USFWS, and the National Oceanographic and Atmospheric Administration's Fisheries Service (NOAA Fisheries). Again, staff recommends early consultation with these agencies to minimize the impacts of the Project on sensitive species.

Climate Change

5. Greenhouse Gases: A greenhouse gas (GHG) emissions analysis consistent with the California Global Warming Solutions Act (AB 32) and required by section 15064.4 of the State CEQA Guidelines[1] should be included in the EIS/EIR. This analysis should identify a threshold for significance for GHG emissions, calculate the level of GHGs that will be emitted as a result of construction and ultimate build-out of the Project, determine the significance of the impacts of those emissions, and, if impacts are significant, identify mitigation measures that would reduce or minimize them. The analysis should pay particular attention to the possibility of cumulative impacts of GHG emissions.

[1] The State "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

Cultural Resources

6. Submerged Resources: The EIS/EIR should evaluate the possibility of submerged cultural resources in the Project area. The CSLC maintains a shipwrecks database, available at http://shipwrecks.slc.ca.gov, that can assist with this analysis. The database includes known and potential vessels located on the State's tide and submerged lands; however, the locations of many shipwrecks remain unknown. Please note that any submerged archaeological site or submerged historic resource that has remained in state waters for more than 50 years is presumed to be significant.

7. Title to Resources: The EIS/EIR should mention that the title to all abandoned shipwrecks, archaeological sites, and historic or cultural resources on or in the tide and submerged lands of California is vested in the State and under the jurisdiction of the CSLC. Mitigation measures should be developed to address any submerged cultural resources that may be affected by the proposed Project and any unanticipated discoveries during the Project's construction. CSLC staff would like to review the proposed mitigation measures and requests that WSAFCA consult with CSLC staff, should any cultural resources be discovered during construction of the proposed Project.

Hydrology and Water Quality

8. Dredging and Construction Disturbance: WSAFCA should disclose and analyze the Project's potential to adversely affect water quality. Such impacts are likely to include increased turbidity and sedimentation from dredging, fill, and other in-water construction work, and potential pollution from worksite spills or mobilization of pollutants from the dredged soils. For any effects found to be potentially significant, the EIS/EIR should identify feasible mitigation measures, such as use of turbidity curtains, which would avoid or lessen such effects.

Recreation

9. Public Access: As public access and recreation on State lands are key concerns of the Public Trust, CSLC staff requests that the EIS/EIR analyze the Project's short-term and long-term impacts on recreation resources, both during construction and for the life of the Project. Any significant impacts will require mitigation measures that either minimize or reduce the impacts or otherwise compensate visitors.

Mitigation Measures

10. Adequate Mitigation: To avoid the improper deferral of mitigation, mitigation measures should either be presented as specific, feasible, enforceable obligations, or should be presented as formulas containing "performance standards which would mitigate the significant effect of the project and which

may be accomplished in more than one specified way" (State CEQA Guidelines § 15126.4, subd. (b)).

Thank you for the opportunity to comment on the NOP for the Project. As a trustee and potentially responsible agency, the CSLC will need to rely on the Final EIS/EIR for the issuance of any new lease as specified above and, therefore, we request that you consider our comments during preparation of the EIS/EIR. Please send additional information on the Project to the CSLC staff listed below as plans become finalized.

Please send copies of future Project-related documents or refer questions concerning environmental review to Sarah Sugar, Environmental Scientist, at (916) 574-2274 or via e-mail at sarah.sugar@slc.ca.gov. For questions concerning CSLC leasing jurisdiction, please contact Ninette Lee, Public Land Manager, at (916) 574-1869, or via email at ninette.lee@slc.ca.gov

Sincerely,

Cy R. Oggins, Chief
Division of Environmental Planning
and Management

cc: Office of Planning and Research
Ninette Lee, LMD, CSLC
Sarah Sugar, DEPM, CSLC

CALIFORNIA STATE LANDS COMMISSION
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202

09/26/2011
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Megan Smith, ICF International
I/C of West Sacramento Area Flood Control
Agency
630 K Street, Suite 400
Sacramento, CA 95814

95814-4331

The Southport Sacramento River Early Implementation Project

Comment Card

WSAFCA West Sacramento Area Flood Control Agency

US Army Corps of Engineers Sacramento District

Name: Kim McDonald Date: Sept 23, 2011

Telephone: 916-373-1644 Email:

Affiliation: Landowner Title (if applicable):

Street Address: 4390 S River Rd

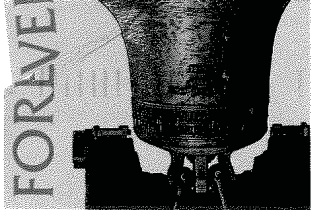
City: West Sacramento State: Ca Zip: 95691

Thank you for your interest in this flood risk-reduction effort. The West Sacramento Area Flood Control Agency, and the U.S. Army Corps of Engineers value your input regarding this Early Implementation Project. Please provide us with your comments regarding the scope of the Environmental Impact Statement/ Environmental Impact Report being prepared for this project. Please write legibly.

For your convenience, feel free to take this card with you, fill it out at your opportunity, and mail it. You may also send comments by email to *southportcomments@icfi.com*. ***All comments must be postmarked by September 26, 2011***. Thank you for your interest in the Southport Sacramento River EIP.

Your goal seems to be to complete this project as fast as possible with as much money as you can possibly get from government funding, I would rather it be the best long term plan. You seem to want people to fee it is 100% safe to live in a flood plane, elevation is the only safe way to go. Removing dirt from nearby to build an earthen dam makes that land unusable and creates future seepage problems The new levee is basicly an earthen dam made in a seismicly active area, not a good idea. Our levees were improved within the last twenty years and already they're deemed dificient, will history repeat itself? Instead of once again rebulding the levees, why not invest in reducing the flow of the river during rainy season. Rain water used to sit on open ground for days until it found its way into the groundwater system. Now ~~to~~ neighborhoods stand on that ground and the water is pumped immeadiatly to the river via the sewer system. This water needs to be delayed or diverted

TAKE THE TIME TO DO THIS THE RIGHT WAY PLEASE



The Southport Sacramento River Early Implementation Project

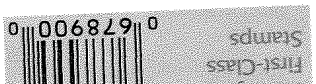
PLEASE FOLD ALONG THIS LINE FOR MAILING

SACRAMENTO CA 957

26 SEP 2011 PM 5 L

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814



43

The Southport Sacramento River Early Implementation Project

Comment Card

WSAFCA West Sacramento Area Flood Control Agency

US Army Corps of Engineers Sacramento District

Name: Joyce Belli Date: 9-22-2011

Telephone: 916 371 5538 Email:

Affiliation: Title (if applicable):

Street Address: 2664 Meadowlark Cir.

City: W. Sacto State: CA Zip: 95691

Thank you for your interest in this flood risk-reduction effort. The West Sacramento Area Flood Control Agency, and the U.S. Army Corps of Engineers value your input regarding this Early Implementation Project. Please provide us with your comments regarding the scope of the Environmental Impact Statement/ Environmental Impact Report being prepared for this project. Please write legibly.

For your convenience, feel free to take this card with you, fill it out at your opportunity, and mail it. You may also send comments by email to *southportcomments@icfi.com*. ***All comments must be postmarked by September 26, 2011***. Thank you for your interest in the Southport Sacramento River EIP.

I would hate to see the construction of setback levees: it would destroy the lush green land along the river, animal habitats and it would uproot the family that live there.

I believe a slurry wall is currently going in the Rivers project in the north section of W. Sacto. I don't believe homes were taken there or properties destroy - you are still able to enjoy the views & wild life along the river.

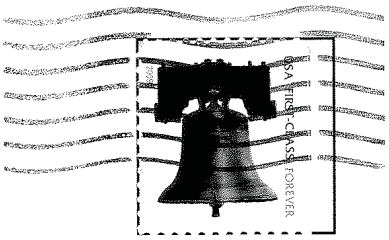
The W. Sacto. Flood Control Agency + the Army Corp of Engineers can improve our levees without destroying homes, animal habitats + our lush lands.

The Southport Sacramento River Early Implementation Project

PLEASE FOLD ALONG THIS LINE FOR MAILING

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

SACRAMENTO CA 95814
PM
24 SEP
2011



West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

The Southport Sacramento River Early Implementation Project

Comment Card

WSAFCA West Sacramento Area Flood Control Agency

US Army Corps of Engineers Sacramento District

Name: JOEL F McCray JR Date: 9-23-2011

Telephone: 916-371-1938 Email: JFmccray@STARBAND.NET

Affiliation: JFMcCray PLASTERING Title (if applicable): Vice President

Street Address: 2590 South River Road

City: West Sacramento State: CA Zip: 95691

Thank you for your interest in this flood risk-reduction effort. The West Sacramento Area Flood Control Agency, and the U.S. Army Corps of Engineers value your input regarding this Early Implementation Project. Please provide us with your comments regarding the scope of the Environmental Impact Statement/ Environmental Impact Report being prepared for this project. Please write legibly.

For your convenience, feel free to take this card with you, fill it out at your opportunity, and mail it. You may also send comments by email to *southportcomments@icfi.com*. ***All comments must be postmarked by September 26, 2011***. Thank you for your interest in the Southport Sacramento River EIP.

I Think the Levee CAN Be Fixed IN A Way less Degree that WAS presented At the meeting, I think That their should Be more Than the 3 options looked At. I agree with Dave that the levee CAN Be fixed while the River is low, AND I ALSO Feel that you Don't have to take Alot of People's LAND To Do It. You CAN Even Fix the River Side of The levee Instead of our SIDE. People At the meeting were TALKING About Tree's AND Vegition AND Animal habitates like Gardner Snakes, I mean Come on Are Not People more important? I Would Hope So, We Are talking Not only About People's LAND But their life's to, we HAve Lost BLOOD on this LAND, Both My Father AND Grandmo Died IN The house you Want To TAKE, I Think that should Be more Important than A tree or a Snake. We have Been Here For more than 35 Years, This house is our Home, ALSO I think the part About Future' use's of The land Was like A SLAP IN The FACE, wanting TO MAKE Hoarse trails and Bike trails AND water parks out of our Home IS Disrespectfull.

The Southport Sacramento River Early Implementation Project

PLEASE FOLD ALONG THIS LINE FOR MAILING

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

45

The Southport Sacramento River Early Implementation Project

Comment Card

WSAFCA West Sacramento Area Flood Control Agency

US Army Corps of Engineers Sacramento District

Name: Dawn Caldwell Date: 9-22-11

Telephone: 916-337-3443 Email:

Affiliation: West Sac. Resident & Business owner Title (if applicable): Moxie Salon

Street Address: 1502 Maryland Ave

City: West Sac State: CA Zip: 95691

Thank you for your interest in this flood risk-reduction effort. The West Sacramento Area Flood Control Agency, and the U.S. Army Corps of Engineers value your input regarding this Early Implementation Project. Please provide us with your comments regarding the scope of the Environmental Impact Statement/ Environmental Impact Report being prepared for this project. Please write legibly.

For your convenience, feel free to take this card with you, fill it out at your opportunity, and mail it. You may also send comments by email to *southportcomments@icfi.com*. ***All comments must be postmarked by September 26, 2011***. Thank you for your interest in the Southport Sacramento River EIP.

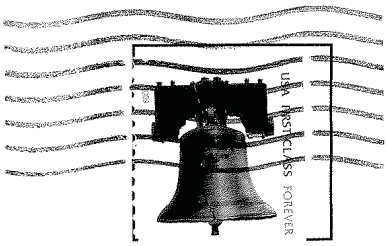
I understand we need to improve the levees in west Sacramento, what I dont like is the fact that you would want to choose a setback or seepage berms that will take familys out of there homes and destroy some of our habitat. I understand that a slurry wall would leave family's in there home and would not take and destroy our habitat. we need to think about people and animals and try to save them both and secure our levees.

Thank you for your time.

The Southport Sacramento River Early Implementation Project

PLEASE FOLD ALONG THIS LINE FOR MAILING

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814



West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

SACRAMENTO AREA BICYCLE ADVOCATES

909 12th Street Suite 116 – Sacramento, CA 95814 – (916) 444-6600 – www.sacbike.org

September 8, 2011

John Suazo, Planning Division
US Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, CA 95814
john.suazo@usace.army.mil

Subject: Notice of Preparation (NOP) for Southport Sacramento River Early Implementation Project EIS/EIR

Dear Mr. Suazo: Thank you for the opportunity to comment on the NOP for the subject project.

River Road (along the right/west bank of the Sacramento River), Gregory Ave, and Jefferson Blvd in the project study area are important routes for utilitarian and recreational bicycling. Construction of the subject project will cause significant adverse impacts to these existing bicycle routes. To mitigate this significant adverse impact, the EIS/EIR must describe adequate measures including:

- Alternative bicycle access through or adjacent to construction areas,
- Proper advance signage for any detours or route changes,
- Signage for vehicle operators (for example, “share the road” signs and pavement symbols) and maximum vehicle speed limits of 25 mph where separate bicycle lanes cannot be provided,
- Advance development of Traffic Control Plans that show traffic control measures for bicyclists with the plans reviewed and approved before construction initiation by the West Sacramento and Yolo County bicycle coordinators, and
- Advance noticing of disruptions, closures, and detours to bicycle-interest organizations in the Sacramento area.

The EIS/EIR must also address any possible impacts to the recreational corridors proposed for bicycle trail development in the West Sacramento Parks Master Plan. In the near-term future, these corridors will become critical routes for utilitarian and recreational bicycling as West Sacramento continues to grow.

SABA works to ensure that bicycling is safe, convenient, and desirable for everyday transportation. Bicycling is the healthiest, cleanest, cheapest, quietest, most energy efficient, and least congesting form of transportation.

Thank you for considering our comments.

Sincerely,

Jordan Lang
Project Assistant

1947 Galileo Ct., Suite 103 • Davis, California 95618

(530) 757-3650 • (800) 287-3650 • Fax (530) 757-3670

October 4, 2011

Mr. John Suazo
US Army Corps of Engineers, Sacramento District
Attn. Planning Division (CESPK-PD-R)
1325 J Street
Sacramento, CA 95814

Re: Notice of Preparation – EIR/EIS for Southport Sacramento River Early Implementation Project

Dear Mr. Suazo

The Yolo Solano Air Quality Management District (District) has received the Notice of Preparation (NOP) for the project referenced above, and the District would like to make the following comments:

1. The District has published a guidance document containing instructions for developing air quality analyses in CEQA documents. This document, the *Handbook for Assessing and Mitigating Air Quality Impacts* may be consulted as the lead agency assesses potential impacts from both the proposed general plan and climate action plan. The document can be found on the District's website at www.ysaqmd.org .

2. Project construction emissions would certainly have the potential to exceed the District's threshold of significance for particulate matter (PM), both from diesel exhaust and fugitive dust, reactive organic gases (ROG), and nitrogen oxides (NOx). If the normal Urbemis or CalEmod defaults are not used, a list of on and off road construction equipment with the corresponding hours of operation and miles should be provided with criteria pollutants provided in ponds per day for the construction period.

3. If the District's thresholds of significance for criteria pollutants are exceeded, then a list of mitigation measures should be included. For a list of potential mitigation measures, the District's Handbook, mentioned above, can be consulted. At a minimum, the Best Management Practices for reduction of particulate matter during construction should be implemented. The lead agency can also contact District staff to discuss possible mitigation measures.

4. The District's *Handbook for Assessing and Mitigating Air Quality Impacts* includes guidance on how to assess other potential impacts, such as carbon monoxide hotspots, odors, and impacts from toxic air contaminants (TACs). Where an analysis is appropriate, the District's guidance should be consulted.

In conclusion, the District appreciates receiving the NOP and the opportunity to discuss the recommendations presented in this letter. If you require additional information or would like to discuss the project, please contact me at (530) 757-3668 or I can be emailed at mjones@ysaqmd.org.

Sincerely,

Matthew R Jones

Matthew R. Jones
Supervising Air Quality Planner

Appendix B.2

Supplemental Scoping Report—May 2013

Memorandum

Date:	May 9, 2013
To:	Tanis Toland U.S. Army Corps of Engineers, Sacramento District 1325 J Street Sacramento, CA 95814 John Powderly City of West Sacramento 1110 West Capitol Avenue West Sacramento, CA 95691
Cc:	Ric Reinhardt, MBK Engineers; Derek Larsen, MBK Engineers; Michael Vecchio, HDR; Lucy Eidam Crocker, Crocker & Crocker; Christine Braziel, Crocker & Crocker; Ken Ruzich, WSAFCA
From:	Jennifer Rogers, ICF Community Affairs Specialist Megan Smith, ICF Southport EIR Senior Project Manager
Subject:	**Southport Sacramento River EIP Supplemental Scoping Report**

Introduction

To comply with the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA), the U.S. Army Corps of Engineers (USACE) and the West Sacramento Area Flood Control Agency (WSAFCA) are preparing a joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Southport Sacramento River Early Implementation Project (Southport EIP). The EIS/EIR will analyze and disclose the potential effects the Southport EIP may have on the natural and human environment and identify mitigation measures and alternatives to avoid significant effects. USACE is the lead agency under NEPA, and WSAFCA is the project proponent and lead agency under CEQA. While WSAFCA is proposing the Southport EIP, USACE approval is needed for alterations to Federal levees under Section 14 of the Rivers and Harbors Act; discharge of dredge or fill materials into jurisdictional waters of the United States under Section 404 of the Clean Water Act; and activities in navigable waters under Section 10 of the Rivers and Harbors Act.

In summer 2011, WSAFCA and USACE issued a Notice of Preparation (NOP) and Notice of Intent (NOI), respectively, to prepare the joint EIS/EIR. A 30-day comment period was opened and two scoping meetings were held. Since then, WSAFCA has expanded the Southport EIP study area to include additional soil borrow sites that may be needed to construct the Southport EIP and a

modified roadway alignment. The expanded study area includes the area of flood risk-reduction measure construction; roadway construction and/or relocation; and potential soil borrow sites. Because WSAFCA has increased the study area, a second 30-day comment period was held from March 8, 2013 to April 8, 2013 to solicit additional comments inclusive of the additional borrow sites. After considering all comments received during both scoping periods, WSAFCA and USACE will complete and release the draft EIS/EIR, available for public review in summer 2013. This document summarizes the re-scoping process and comments received in 2013.

Noticing

Notice of Preparation/Intent

In compliance with the requirements set forth in CEQA, WSAFCA, as the lead agency, prepared a Supplemental NOP. The Supplemental NOP contained a brief description of the proposed project; probable environmental effects; the date, time and place of the public scoping meetings; and contact information. The Supplemental NOP solicited participation in determining the scope of the EIS/EIR. On March 8, 2013, the Supplemental NOP was sent to Responsible and Trustee Agencies and involved federal agencies and parties previously requesting notice in writing. In advance of that, on the afternoon of March 7, the Supplemental NOP was filed with the State Clearinghouse. The comment period was March 8 to April 8, 2013. Similarly, to comply with the National Environmental Policy Act, an NOI was published in the *Federal Register* on March 15, 2013 to notice the scoping meetings, comment period, and supplemental study area to the project. It can be viewed online at http://www.gpo.gov/fdsys/pkg/FR-2013-03-15/html/2013-05928.htm.

Mailings

WSAFCA mailed approximately 2,135 abbreviated versions of the Supplemental NOP to stakeholders, namely landowners, on March 13, 2013 to make them aware of the re-scoping effort and invite them to the scoping meeting on March 28, 2013. Invitations were sent to all properties within 500 feet of the project site, including borrow areas, and within 100 feet of a proposed haul routes. Approximately 230 invitations were returned by the postal service because of an erroneous address, vacant residence, or related causes.

Website

WSAFCA posted language on the City's flood management web page at http://www.cityofwestsacramento.org/city/flood/southport_eip/ in advance of the meeting. The meeting materials presented at the meeting will be posted on this web page in spring 2013 to serve as a public record of the event.

Legal Notices

Legal notices briefly introducing the lead agencies, the proposed Southport EIP and additional study area, and publicizing the scoping meeting were published in the *West Sacramento News-Ledger* and *The West Sacramento Press* on March 8, 2013. The *West Sacramento News-Ledger* and *West Sacramento Press* reach local residents, as these are two news outlets that report on local events specific to the City of West Sacramento.

Attachment A contains copies of the following documents.

- Supplemental NOP (including resource agency mailing list)
- Revised NOI
- Meeting invitation flier mailed in hard copy
- *West Sacramento News-Ledger* and *West Sacramento Press* notices

Public Meetings

One public scoping meeting was held to inform the public of the proposed Southport EIP, the expanded study areas added since scoping in 2011 that will be analyzed in the EIS/EIR, and provide an opportunity for input on the range of alternatives, environmental effects, and any issues of concern. The meeting was held on March 28, 2013 at West Sacramento City Hall, in the Galleria Room from 5:30 to 7:30 p.m. The meeting time was chosen to accommodate schedules of public agency representatives and the general public, including residents and business owners.

A 20-minute informal presentation was given at approximately 6:00 p.m. to briefly introduce the proposed project, project objectives, schedule, potential alternatives, and environmental compliance, and the need for an additional scoping process.

The meeting was open house–style in which attendees could read and view the information about the Southport EIP, the additional study area, and interact with project staff, including WSAFCA, USACE, the City, MBK and HDR Engineering staff, and ICF environmental consulting staff.

Nearly 30 graphic display boards were available for attendees to view. The boards described and illustrated the West Sacramento Levee Improvements Program history and the Southport EIP's purpose, need and objectives, original and expanded study areas, levee deficiencies and potential improvements, environmental considerations, and the NEPA/CEQA process. Project staff were stationed at the display boards to provide additional detail or answer any questions.

A prepared fact sheet was available for attendees to take with them. The fact sheet provided an overview of the Southport EIP and its objectives, the original and expanded study area, and the environmental compliance process.

Comment cards were offered so that meeting attendees could provide feedback on the proposed project. These cards could be filled out during the meeting and given to a project team member or

filled out after the meeting and sent to either USACE or WSAFCA by April 8, 2013. Attachment B contains copies of the following materials.

- Display boards
- Fact sheet
- Comment card

A total of 12 people attended the meeting. Eighteen comments were received during the comment period. Three comments were received 2 days after scoping period closed, but will still be considered in the development of the EIS/EIR. Below is a summary of recurring topics expressed in the written comments. Attachment C contains all written comments received during the scoping period.

- Potential damage/impacts to residential structures and acquisition
- Potential damage to public utilities present in the project area
- Floodplain mapping
- Disclosure and legality of mitigation banking
- Potential impacts of the USACE vegetation policy
- Potential impacts to wildlife resources from construction and USACE vegetation policy
- Concerns related to groundwater levels and quality and hydrology
- Concerns related to traffic impacts/hours of construction/dust
- Potential public levee access and recreation impacts
- Potential public utilities impacts/relocation
- Potential impacts to and mitigation for agricultural lands

Next Steps and Recommendations

The comments received during the scoping period will assist in determining the issues to be evaluated in detail in the EIS/EIR. Alternatives developed based on the scoping process will be analyzed, and a draft EIS/EIR will be developed. Upon the release of the draft EIS/EIR in summer 2013, the public will have 45 days to comment on the document. Additionally, at least one public meeting will be held so the public and agencies can learn more about the draft EIS/EIR, ask questions regarding the analysis, and provide comments. At these meetings, the alternatives will be presented and explained.

Once the public comment period on the draft EIS/EIR has concluded, USACE and WSAFCA will consider and respond to all comments and prepare a final EIS/EIR. USACE and WSAFCA will consider all written comments in deciding which alternative(s) to select and implement. USACE and WSAFCA will document that selection in a record of decision (for NEPA), no sooner than 30 days following publication of the Final EIS/EIR, and in a notice of determination (for CEQA). USACE and

WSAFCA will continue its outreach efforts related to the draft EIS/EIR, and separately, WSAFCA will continue its outreach efforts to landowners and other stakeholders through its cooperation with Crocker & Crocker.

###

Attachment A

- Supplemental Notice of Preparation (including resource agency mailing list)
- Revised NOI
- Meeting invitation flier mailed in hard copy
- *West Sacramento News-Ledger* and *West Sacramento Press* notices

Notice of Preparation

To:	State Clearinghouse, Responsible Agencies, Trustee Agencies, Interested Parties	From:	West Sacramento Area Flood Control Agency
	(Agency)		*(Agency)*
	See Distribution List		1110 West Capitol Avenue West Sacramento, CA 95691
	(Address)		*(Address)*

Subject: Supplemental Notice of Preparation of an Environmental Impact Statement/Environmental Impact Report for the Southport Sacramento River Early Implementation Project

The West Sacramento Area Flood Control Agency (WSAFCA) is proposing the Southport Sacramento River Early Implementation Project (EIP) to implement flood risk–reduction measures along the Sacramento River South Levee in the city of West Sacramento, Yolo County, California. On August 26, 2011, WSAFCA issued a Notice of Preparation (NOP) for the EIP and undertook a 30-day public comment period. Since that time, WSAFCA has expanded the EIP study area to include additional soil borrow sites that may be employed to provide borrow material needed to construct the EIP. The study area, shown in Figure 1, encompasses the area of levee risk-reduction measure construction along the river corridor, roadway construction and/or relocation, and potential soil borrow sites. The construction area extends along the right (west) bank of the Sacramento River south of the Barge Canal downstream approximately 6 miles to the South Cross Levee, adjacent to the Southport community of West Sacramento. The potential soil borrow sites are located to the east and west of southern Jefferson Blvd.; adjacent to the construction area; immediately west of the Deep Water Ship Channel; and south of the South Cross Levee.

The project would bring the levee up to standard with Federal and state flood protection criteria, as well as providing opportunities for ecosystem restoration and public recreation. The U.S. Army Corps of Engineers (USACE), acting as the Federal lead agency under the National Environmental Policy Act (NEPA), and WSAFCA, acting as lead agency under the California Environmental Quality Act (CEQA), have determined that a project-level Environmental Impact Statement/Environmental Impact Report (EIS/EIR) should be prepared for the project.

Responsible and Trustee Agencies
Responsible and trustee agencies under CEQA may include City of West Sacramento, Yolo County, California Department of Fish and Wildlife, California Department of Water Resources, Central Valley Flood Protection Board, California Regional Water Quality Control Board, State Lands Commission, and California Department of Parks and Recreation.

Public and Agency Input
USACE and WSAFCA are requesting your input on the scope and content of the Southport Sacramento River EIP EIS/EIR. All interested parties are invited to comment for a period of 30 days, beginning Friday, March 8, 2013. Please send comments by e mail or standard mail to a contact below by 5 p.m., Monday, April 8, 2013.

Megan Smith, Project Manager
ICF International
630 K Street, Suite 400
Sacramento, CA 95814
Email: megan.smith@icfi.com

or

Ms. Tanis Toland
U.S. Army Corps of Engineers, Sacramento District
Delta Programs Integration & Ecosystem Restoration
1325 J Street
Sacramento, CA 95814
Email: tanis.j.toland@usace.army.mil

If commenting on behalf of a public agency or non-governmental organization, please include the name of a contact person.

The public can meet with lead agency representatives and provide written comments at a public scoping meeting to be held March 28, 2013 at 5:30 p.m. at the City of West Sacramento City Hall Galleria Room, 1110 W. Capitol Ave., West Sacramento, CA 95691. The presentation will begin at 6 p.m.

The attachment includes supplemental information for the proposed Southport Sacramento River EIP.

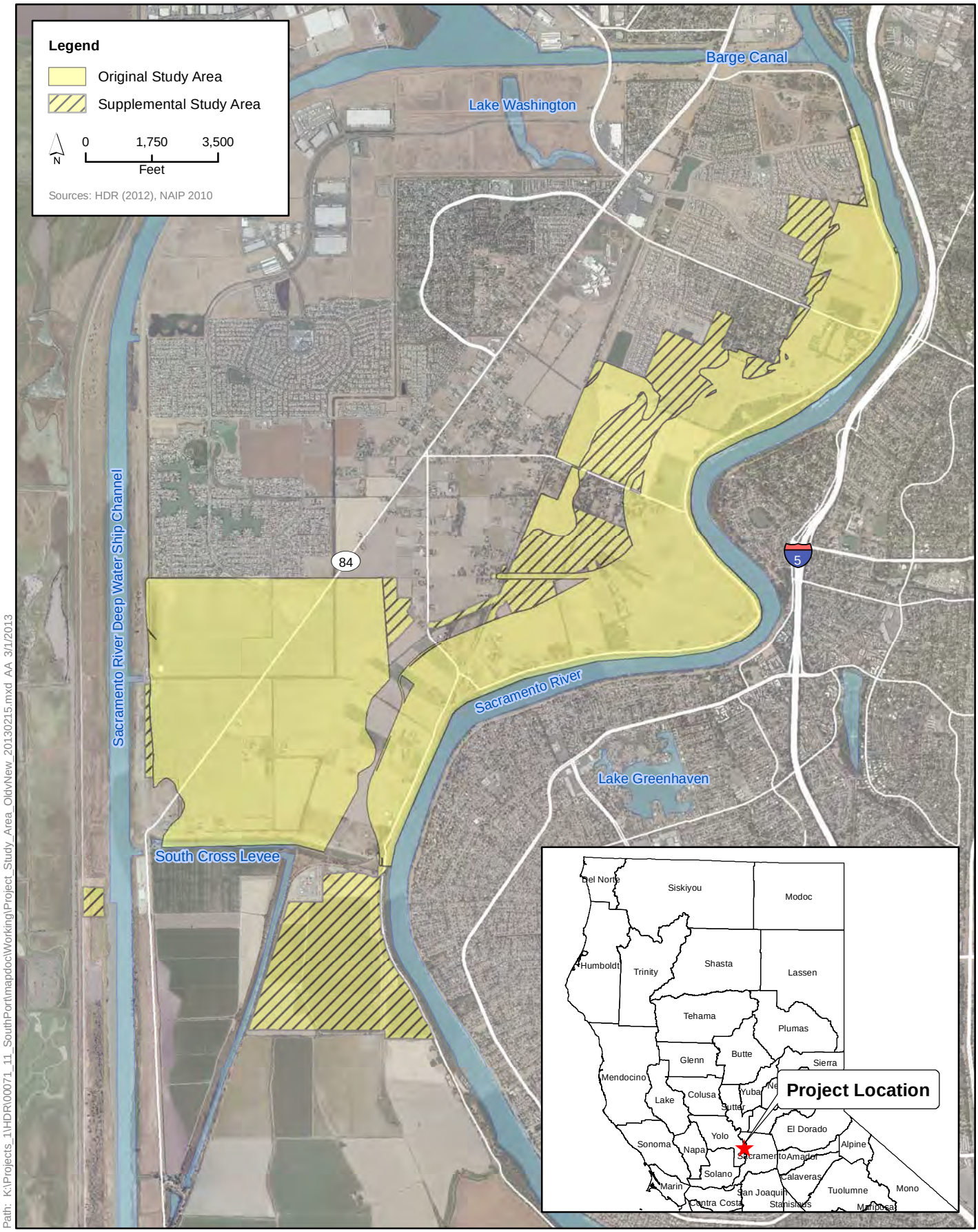
Date: 3/7/13

Signature: John L. Ponton

Title: Associate Planner, City of West Sacramento

Telephone: (916) 617-4645

Reference: California Code of Regulations, Title 14, (State CEQA Guidelines) Sections 15082(a), 15103, 15375.



Path: K:\Projects_1\HDR\00071_11_SouthPort\mapdoc\Working\Project_Study_Area_OldvNew_20130215.mxd AA 3/1/2013

Figure 1
EIP Study Area

Attachment to Supplemental Notice of Preparation
Environmental Impact Statement/Environmental Impact Report
Additional Information

Location of Project Study Area:

As introduced in the Supplemental Notice of Preparation, the West Sacramento Area Flood Control Agency (WSAFCA) is proposing the Southport Sacramento River Early Implementation Project (EIP) to implement flood risk–reduction measures along the Sacramento River South Levee in the city of West Sacramento, Yolo County, California. On August 26, 2011, WSAFCA issued a Notice of Preparation (NOP) for the EIP and undertook a 30-day public comment period. Since that time, WSAFCA has expanded the EIP study area to include additional soil borrow sites that may be employed to provide borrow material needed to construct the EIP. The study area, shown in Figure 1, encompasses the area of levee risk-reduction measure construction along the river corridor, roadway construction and/or relocation, and potential soil borrow sites. The construction area extends along the right (west) bank of the Sacramento River south of the Barge Canal downstream approximately 6 miles to the South Cross Levee, adjacent to the Southport community of West Sacramento. The potential soil borrow sites are located to the east and west of southern Jefferson Blvd.; adjacent to the construction area; immediately west of the Deep Water Ship Channel; and south of the South Cross Levee.

Project Purpose and Lead Agencies:

The project would bring the levee up to standard with Federal and state flood protection criteria, as well as provide opportunities for ecosystem restoration and public recreation. The U.S. Army Corps of Engineers (USACE) will act as the Federal lead agency under the National Environmental Policy Act (NEPA). WSAFCA will act as lead agency under the California Environmental Quality Act (CEQA). As such, WSAFCA has principal responsibility for carrying out and approving the project. The agencies have determined that a project-level Environmental Impact Statement/Environmental Impact Report (EIS/EIR) should be prepared for the project.

USACE has three potential actions associated with WSAFCA's proposed project:

- under 33 United States Code, Section 408 (Section 408), the Chief of Engineers may grant permission to alter an existing flood control structure if it is not injurious to the public interest and does not impair the usefulness of such work;
- under Section 404 of the Clean Water Act, the District Engineer may permit the discharge of dredged or fill material into waters of the United States if the discharge meets the requirements for the Environmental Protection Agency's 404 (b)(l) guidelines and is not contrary to the public interest; and
- under Section 10 of the Rivers and Harbors Act, the District Engineer may permit activities that do not affect navigable waters.

WSAFCA is requesting such permissions in order to implement the project. The project must comply with NEPA to acquire these permissions. This project would continue work undertaken by WSAFCA for the I Street Bridge EIP (constructed in 2008), The Rivers and CHP Academy EIPs (constructed from 2011 to 2012), and a separate effort led by USACE and the Central Valley Flood Protection Board at the Barge Canal in West Sacramento under the Sacramento River Bank Protection Project.

Project Description:

The EIS/EIR will analyze the possible environmental effects of combining a variety of flood risk-reduction measures to address known levee deficiencies. The flood risk-reduction measures considered in the EIS/EIR may include:

- slope flattening of the existing levee,
- use of seepage berms located to the land side of the levee,
- rock slope protection located to the water side of the levee,
- setback levees and/or adjacent levees located landward of the existing levee,
- relief wells, and
- slurry cut-off walls.

The EIS/EIR will consider the environmental impacts of other foreseeable project elements and mitigation measures located in the study area. Foreseeable construction and maintenance of such flood protection measures likely would include, but not be limited to:

- use of neighboring roadways for project ingress and egress;
- creation of temporary access roads;
- construction of new roadways, including elevated spans;
- resurfacing and/or relocation of existing roadways;
- removal of vegetation adjacent to the riverfront;
- extraction of soil from identified borrow sites;
- disposal of excess soil at identified disposal sites; and
- relocation of public and private utilities.

The project will also be defined to include ecosystem restoration, such as shallow water and riparian habitat creation, planting and revegetation, and similar features. Recreation features will also be analyzed, such as trails, wayfinding and interpretive signs; and associated amenities.

Environmental Factors Potentially Affected:

The environmental factors checked below would potentially be affected by the proposed project (i.e., the project would involve at least one impact that is a "Potentially Significant Impact"). There may also be one or more mandatory findings of significance, as defined by CEQA Guidelines Section 15065.

X	Agriculture Resources	X	Air Quality	X	Cultural Resources
X	Fish and Aquatic Resources	X	Flood Management/ Geomorphic Conditions	X	Geology, Seismicity, Soils and Mineral Resources
X	Mineral Resources	X	Land Use/Planning	X	Noise
X	Population/Housing	X	Public Services	X	Recreation
X	Socioeconomics, Environmental Justice, and Community Effects	X	Transportation and Navigation	X	Utilities and Public Services
X	Vegetation and Wetlands	X	Visual Resources	X	Water Quality and Groundwater Resources
X	Wildlife				

Attachment to Notice of Preparation
Environmental Impact Statement/Environmental Impact Report
Distribution List

Government Agencies

Bureau of Indian Affairs
Pacific Regional Office
Environmental Compliance Department
2800 Cottage Way
Sacramento, CA 95825

Bureau of Reclamation
Mid-Pacific Region
2800 Cottage Way
Sacramento CA 95825

California Department of Fish and Game
Jeff Drogensen
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670

California Department of Conservation
Rebecca Salazar
801 K Street, MS-24-02
Sacramento, CA 95814

California Department of Fish and Wildlife, Region 2
Paul Hofmann
402 S Merrill Ave
Willows, CA 95988

California Department of Fish and Wildlife, Region 3
Scott Wilson
7329 Silverado Trail
Napa, CA 94558

California Department of Fish Wildlife, Water Branch
Gina Ford
830 S Street
Sacramento, CA 95811

California Department of Parks and Recreation
Bob Baxter
PO Box 942896
Sacramento, CA 94296-0001

California Department of Transportation, District 3
Kendall Schinke
2983 Gateway Oaks Blvd., Suite 100
Sacramento, CA 95833

California Department of Water Resources
Elizabeth Bryson
3464 El Camino Avenue, Suite 201
Sacramento, CA 95821

California Department of Water Resources
Kristin Ford
3464 El Camino Avenue, Suite 200
Sacramento, CA 95821

Central Valley Flood Protection Board
James Herota
3310 El Camino Ave. Room 151
Sacramento, CA 95821

Central Valley Regional Water Quality Control Board
CEQA Compliance Division
11020 Sun Center Dr, #200
Rancho Cordova, CA 95670

Central Valley Regional Water Quality Control Board
Greg Vaughn
11020 Sun Center Dr, #200
Rancho Cordova, CA 95670

City of Sacramento
Planning Director
915 I Street, New City Hall, 3rd Floor
Sacramento, CA 95814

Colusa County
Director
220 12th Street
Colusa, CA 95932

Delta Protection Commission
Alex Westhoff
PO Box 530
Walnut Grove, CA 95690

Department of Boating and Waterways
David Johnson
2000 Evergreen Street, Suite 100
Sacramento, CA 95815-3888

Department of General Services, Real Estate Division
Shirley Bramham
707 3rd Street, Suite 505
West Sacramento, CA 95605

Federal Highway Administration
NEPA/CEQA Compliance Dept.
1200 New Jersey Ave., SE
Washington, DC 20590

FEMA Region IX, Federal Emergency Management
Donna Meyer, Deputy Regional Environmental Officer
111 Broadway, Ste. 1200
Oakland, CA 94607

National Marine Fisheries Service
Mike Hendrick
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

Native American Heritage Commission
Debbie Pilus Treadway
915 Capitol Mall, Room 364
Sacramento, CA 95814

Office of Historic Preservation
Milford Wayne Donaldson
1416 9th Street, Room 1442-7
Sacramento, CA 95814

Pacific Gas and Electric Company
Meredith Williams
350 Salem Street
Chico, CA 95928

Sacramento Air Quality Management District
Karen Huss
1947 Galileo Ct., Ste. 103
Davis, CA 95616

Sacramento Area Flood Control Agency
Tim Washburn
1007 7th Street, 7th Floor
Sacramento, CA 95814

Sacramento County Planning and Community Development Agency
Director
827 7th Street, Room 230
Sacramento, CA 95814

Sacramento National Wildlife Refuge Complex
Environmental Compliance Dept.
752 County Road 99W
Willows, CA 95988

Sacramento Regional County Sanitation District
Sharon Seargent
10545 Armstrong Ave.
Mather, CA 95655

Sierra Northern Railway
President
341 Industrial Way
Woodland, CA 95776

Solano County
Director of Public Works and Planning
601 Texas Street
Fairfield, Ca 94533

State Clearinghouse, Office of Planning & Research
1400 10th Street, Rm 121
Sacramento, CA 95814

State Lands Commission,
Environmental Management Division
Cy Oggins, Division Chief
100 Howe Ave, Suite 100 South
Sacramento, CA 95825

Sutter County Public Works Department
Director of Public Works
1130 Civic Center Blvd.
Yuba City, CA 95993

U.S. Army Corps of Engineers, Sacramento District
Tanis Toland, Attn: Delta Programs Integration & Ecosystem Restoration
1325 J Street
Sacramento, CA 95814

U.S. Department of the Interior, Office of Environmental Policy and Compliance
Patricia Sanderson Port,
Regional Environmental Officer
1111 Jackson Street, Suite 520
Oakland, CA 94607

U.S. Environmental Protection Agency
Connell Dunning
75 Hawthorne Street
San Francisco, CA 94105

U.S. Fish and Wildlife Service
2800 Cottage Way, Room W-2605
Sacramento, CA 95825

USDA Natural Resources Conservation Service
221 W. Court Street
Woodland, CA 95695

Washington Unified School District
Scott Lantsberger, Assistant Superintendent
930 Westacre Road
Sacramento, CA 95691

Yolo County Agricultural Commission
70 Cottonwood Street
Woodland, CA 95695

Yolo County Environmental Health
Bruce Sarazin, Chief
137 N. Cottonwood St., Ste. 2400
Woodland, CA 95695

Yolo County Planning Department
Planning Director
292 West Beamer Street
Woodland, CA 95695

Yolo County Transit Authority
350 Industrial Way
Woodland, CA 95776

Yolo Habitat JPA
Maria Wong, Executive Director
120 West Main Street, Suite C
Woodland, CA 95695

Yolo Solano Air Quality Management District
Matt Jones
1947 Galileo Court, Suite 103
Davis, CA 95616

Non-Governmental Organizations

American Rivers
John Cain, Director, California Flood Management
244 Lake Drive
Kensington, CA 94708

California Farm Bureau Federation
Environmental Compliance Department
2300 River Plaza Drive
Sacramento, CA 95833

Center for Biological Diversity
351 California Street, Suite 600
San Francisco, CA 94104

Defenders of Wildlife
Kim Delfino, California Program Director
1303 J Street, Suite 270
Sacramento, CA 95814

Family Water Alliance
P.O. Box 365
Maxwell, CA 95955

Friends of the River
Ronald Stork, Senior Policy Advocate
1418 20th Street, Suite 100
Sacramento, CA 95811

Friends of the Swainson's Hawk
Judith Lamare, President
915 L Street, Suite C-425
Sacramento, CA 95814

Habitat 2020 Sacramento County
Attn: Chairperson
909 12th Street, Suite 100
Sacramento CA 95814

Sacramento Area Bicycle Advocates
Jordan Lang
909 12th Street, Suite 116
Sacramento, CA 95814

Sacramento River Preservation Trust
PO Box 5366
Chico, CA 95927

Sacramento Valley Landowners Association
PO Box 3014
Sacramento, CA 95812

Sierra Club
Terry Davis
801 K Street, Suite 2700
Sacramento, CA 95814

Sierra Club Motherlode Chapter
Tony Loftin, Chair, Sacramento Group
801 K Street, Suite 2700
Sacramento, CA 95814

Sierra Club-Yolano Group
Pamela Nieberg and Carolyn Hinshaw, Chairperson
3010 Loyola Drive
Davis, CA 95618

The California Central Valley Flood Control Association
910 K Street, Suite 310
Sacramento, CA 95814

The Nature Conservancy
2015 J Street, Suite 103
Sacramento, CA 95814

The Northern California Water Association
455 Capitol Mall # 335
Sacramento, CA 95814-4496

Tuleyome
Andrew Fulks
607 North Street
Woodland, CA 95695

Yolo Audubon Society
Chad Roberts, Conservation Chairman
P.O. Box 886
Davis, CA 95617

Individuals

David Sanders

Forecast Land Investment LLC

Jeralyn and William Wingfield

Linda Pacheco

Seecon Financial and Construction Co.

Yokoyama Aya Irreversible Living Trust

DEPARTMENT OF DEFENSE

Defense Acquisition Regulations System

Acquisition of Items for Which Federal Prison Industries Has a Significant Market Share

AGENCY: Department of Defense (DoD).

ACTION: Notice.

SUMMARY: DoD is publishing the annual list of product categories for which the Federal Prison Industries' share of the DoD Market is greater than five percent.

DATES: *Effective Date:* April 5, 2013.

FOR FURTHER INFORMATION CONTACT: Sheila Harris, telephone 703–614–1254.

SUPPLEMENTARY INFORMATION:

Background

On November 19, 2009, a final rule was published at 74 FR 59914 which amended the Defense Federal Acquisition Regulation Supplement (DFARS) 208.6, to implement Section 827 of the National Defense Authorization Act (NDAA) for Fiscal Year 2008, Public Law 110–181. Section 827 changed DoD competition requirements for purchases from Federal Prison Industries, Inc. (FPI) by requiring DoD to publish an annual list of product categories for which FPI's share of the DoD market was greater than five percent, based on the most recent fiscal year data available. Product categories on the current list, and the products within each identified product category, must be procured using competitive or fair opportunity procedures in accordance with Defense Federal Acquisition Regulation Supplement (DFARS) 208.602–70.

This notification provides an updated list of FPI product categories exceeding five percent of the DoD market, based on Fiscal Year 2012 data obtained from the Federal Procurement Data System. An identical list is also found in the Director, Defense Procurement and Acquisition Policy (DPAP) memorandum dated March 7, 2013. (The DPAP memorandum with the current list of product categories for which FPI has a significant market share is posted at: *http://www.acq.osd.mil/dpap/policy/policyvault/USA007579-12-DPAP.pdf).*

Accordingly, the updated product categories to be competed effective April 5, 2013, are:

- 5220 (Inspection Gages and Precision Layout Tools)
- 5335 (Metal Screening)
- 7210 (Household Furnishings)
- 7230 Draperies, Awnings, and Shades
- 8405 (Outerwear, Men's)
- 8415 (Clothing, Special Purpose)
- 8465 (Individual Equipment)
- 9905 (Signs, Advertising Displays and Identification Plates)

The statute, as implemented also requires DoD to:

(1) Include FPI in the solicitation process for items for which FPI's share of the DoD market is greater than five percent; a timely offer from FPI must be considered; and award procedures must be followed in accordance with existing policy at Federal Acquisition Regulation (FAR) 8.602(a)(4)(ii) through (v).

(2) Continue to be make acquisitions, in accordance with FAR Subpart 8.6., for items from product categories for which FPI does not have a significant market share. FAR 8.602 requires agencies to conduct market research and make a written comparability determination, at the discretion of the contracting officer. Competitive or fair opportunity procedures are appropriate if the FPI product is not comparable in terms of price, quality, or time of delivery.

(3) Section 827 allows modification of the published list if DoD subsequently determines that new data requires adding or omitting a product category from the list.

Manuel Quinones,

Editor, Defense Acquisition Regulations System.

[FR Doc. 2013–06091 Filed 3–14–13; 8:45 am]

BILLING CODE 5001–06–P

DEPARTMENT OF DEFENSE

Department of the Army; Corps of Engineers

Revised Notice of Intent To Prepare a joint Environmental Impact Statement/Environmental Impact Report for the Southport Sacramento River Early Implementation Project, West Sacramento, CA

AGENCY: Department of the Army, U.S. Army Corps of Engineers; DoD.

ACTION: Notice of Intent.

SUMMARY: This notice is a revision of the Notice of Intent published August 26, 2011 (76 FR 53423). Pursuant to the National Environmental Policy Act of 1969, as amended, and the California Environmental Quality Act (CEQA), the U.S. Army Corps of Engineers (USACE) is preparing an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) under Section 14 of the Rivers and Harbors Act of 1899 (as amended) (33 U.S.C. 408), and Section 404 of the Clean Water Act (33 U.S.C. 1344), for the proposed Southport Sacramento River Early Implementation Project (EIP), sponsored by the West Sacramento Area Flood Control Agency (WSAFCA). Figures of the project area can be viewed at *http://www.cityofwestsacramento.org/city/flood.* WSAFCA is planning the Southport Sacramento River EIP to implement flood-risk management measures along the Sacramento River South Levee in the City of West Sacramento, Yolo County, CA. Since publication of the 2011 Notice of Intent, WSAFCA has expanded the study area to include additional potential soil borrow sites. Material from these borrow sites may be used as part of project construction. The potential construction area extends along the right (west) bank of the Sacramento River south of the Barge Canal downstream approximately 6 miles to the South Cross Levee, adjacent to the Southport community of West Sacramento. The potential soil borrow sites are located to the east and west of southern Jefferson Blvd.; adjacent to the construction area; immediately west of the Sacramento Deep Water Ship Channel; and south of the South Cross Levee. In order to implement the project, the sponsor must receive permission from USACE to alter the Federal project under Section 14 of the Rivers and Harbors Act of 1899 (as amended) (33 U.S.C. 408 or, Section 408). USACE also has authority under Section 404 of the Clean Water Act (33 U.S.C. 1344) over activities involving the discharge of dredged or fill material to waters of the United States, which are known to be in the project area. The project would bring the levee up to current Federal and state levee design standards, and provide some opportunities for ecosystem restoration and public recreation. USACE, acting as the federal lead agency under NEPA, and WSAFCA, acting as the state lead agency under the CEQA in coordination with the Central Valley Flood Protection Board, have determined that an EIS/EIR should be prepared to describe alternatives, potential environmental effects, and mitigation measures.

DATES: Written comments regarding the scope of the environmental analysis should be received by April 8, 2013.

ADDRESSES: Written comments concerning this study and requests to be included on the Southport Sacramento River Early Implementation Project mailing list should be submitted to Ms. Tanis Toland, U.S. Army Corps of Engineers, Sacramento District, Attn: Planning Division (CESPK–PD–R), 1325 J Street, Sacramento, CA 95814.

FOR FURTHER INFORMATION CONTACT: Ms. Tanis Toland via telephone at (916)

557–6717, email: *Tanis.J.Toland@usace.army.mil* or regular mail at (see **ADDRESSES**).

SUPPLEMENTARY INFORMATION:

1. *Proposed Action.* WSAFCA is proposing a project along the Sacramento River west levee under the California Department of Water Resources' Early Implementation Program to expeditiously complete flood-risk reduction measures. Known as the Southport Sacramento River EIP, the project proposes implementation of flood-risk reduction measures along a 6-mile long reach between the Barge Canal downstream to the South Cross Levee. Improvements to the levee would address through-seepage, under-seepage, and embankment instability (e.g., overly steepened slopes). As part of the project, an EIS/EIR is being prepared. USACE has authority under Section 14 of the Rivers and Harbors Act of 1899 (as amended) (33 U.S.C. 408), over alterations to federal flood control project levees and any such alterations as proposed by WSAFCA are subject to approval by USACE. USACE also has authority under Section 404 of the Clean Water Act (33 U.S.C. 1344) over activities involving the discharge of dredged or fill material to waters of the United States, which are known to be in the project area. Under Section 10 of the Rivers and Harbors Act, the District Engineer may permit activities which do not affect navigable waters. Due to these authorities, USACE is the lead agency for the EIS pursuant to NEPA. WSAFCA is the lead agency for the EIR according to CEQA as the public agency that has the principal responsibility for carrying out and approving the project.

2. *Alternatives.* The EIS/EIR will consider several alternatives for reducing flood damage. Each alternative analyzed during the investigation will consist of a combination of several measures to reduce the risk of flooding. These measures include, but are not limited to, installing slurry cutoff walls, constructing seepage or stability berms, relief wells, rock slope protection, slope flattening, and potential new levee alignments (setback or adjacent levees).

3. *Scoping Process.*

a. Public scoping meetings were held on September 15, 2011, to present information to the public and receive comments from the public on the project. An additional public scoping meeting will be held to present an overview of changes to the scope of the EIS/EIR since publication of the 2011 Notice of Intent, and to afford all interested parties with an opportunity to provide comments regarding the scope of analysis and potential alternatives. A public scoping meeting will be held on March 28, 2013, at 5:30 p.m. at the City of West Sacramento City Hall Galleria Room, 1110 W. Capitol Ave., West Sacramento, CA 95691. The presentation will begin at 6:00 p.m. Scoping comments previously submitted following publication of the original August 26, 2011, Notice of Intent are still valid and need not be resubmitted.

b. Potentially significant issues to be analyzed in depth in the EIS/EIR include effects on hydraulics, wetlands and other waters of the U.S., vegetation and wildlife resources, special-status species, aesthetics, cultural resources, recreation, land use, fisheries, agricultural resources, water quality, air quality, transportation, and socioeconomics; and cumulative effects of related projects in the study area.

c. USACE is consulting with the State Historic Preservation Officer to comply with the National Historic Preservation Act, and with the U.S. Fish and Wildlife Service and National Marine Fisheries Service to comply with the Endangered Species Act. USACE is also coordinating with the U.S. Fish and Wildlife Service to comply with the Fish and Wildlife Coordination Act.

d. A 45-day public review period will be provided for all interested parties, individuals, and agencies to review and comment on the draft EIS/EIR. All interested parties are encouraged to respond to this notice and provide a current address if they wish to be notified of the draft EIS/EIR circulation.

4. *Availability.* The draft EIS/EIR is currently scheduled to be available for public review and comment in Summer 2013.

Dated: March 7, 2013.

William J. Leady,

Colonel, U.S. Army, District Commander.

[FR Doc. 2013–05928 Filed 3–14–13; 8:45 am]

BILLING CODE 3720–58–P

DEPARTMENT OF EDUCATION

List of Correspondence From July 1, 2012, Through September 30, 2012

AGENCY: Office of Special Education and Rehabilitative Services; Department of Education.

ACTION: Notice.

SUMMARY: The Secretary is publishing the following list of correspondence from the U.S. Department of Education (Department) to individuals during the previous quarter. The correspondence describes the Department's interpretations of the Individuals with Disabilities Education Act (IDEA) or the regulations that implement the IDEA. This list and the letters or other documents described in this list, with personally identifiable information redacted, as appropriate, can be found at: *http://www2.ed.gov/policy/speced/guid/idea/index.html.*

FOR FURTHER INFORMATION CONTACT: Jill Harris or Mary Louise Dirrigl. Telephone: (202) 245–7372.

If you use a telecommunications device for the deaf (TDD) or a text telephone (TTY), you can call the Federal Relay Service (FRS), toll free, at 1–800–877–8339.

Individuals with disabilities can obtain a copy of this list and the letters or other documents described in this list in an accessible format (e.g., braille, large print, audiotape, or compact disc) by contacting Jill Harris or Mary Louise Dirrigl at (202) 245–7372.

SUPPLEMENTARY INFORMATION: The following list identifies correspondence from the Department issued from July 1, 2012, through September 30, 2012. Under section 607(f) of the IDEA, the Secretary is required to publish this list quarterly in the **Federal Register**. The list includes those letters that contain interpretations of the requirements of the IDEA and its implementing regulations, and it may also include letters and other documents that the Department believes will assist the public in understanding the requirements of the law. The list identifies the date and topic of each letter, and it provides summary information, as appropriate. To protect the privacy interests of the individual or individuals involved, personally identifiable information has been redacted, as appropriate.

Part B—Assistance for Education of All Children With Disabilities

Section 612—State Eligibility

Topic Addressed: Children in Private Schools

○ Letter dated August 8, 2012, to Missoula County Public Schools Superintendent Alex P. Apostle, regarding how a local educational agency (LEA) can meet equitable services requirements for parentally-placed private school children with disabilities if student enrollment changes during the school year.

Section 613—Local Educational Agency Eligibility

Topic Addressed: Maintenance of Effort

○ Letter dated August 20, 2012, to Beth Swedeen, Lynn Breedlove, and Maureen Ryan, co-chairs of the Survival

Learn About Updates to the Southport Sacramento River Early Implementation Project!

The West Sacramento Area Flood Control Agency (WSAFCA) is proposing the Southport Sacramento River Early Implementation Project (EIP) to implement flood risk–reduction measures along the Sacramento River South Levee in the city of West Sacramento in Yolo County, CA. In summer 2011, WSAFCA issued a Notice of Preparation (NOP) to prepare an environmental impact statement/report (EIS/R) for the EIP. Since then, WSAFCA has expanded the EIP study area to include additional soil borrow sites that may be needed to construct levee improvements. The expanded study area includes the area of levee risk-reduction measure construction, roadway construction and/or relocation, and potential soil borrow sites (see map). WSAFCA is now issuing a supplemental NOP to include the expanded study area.

The EIP would bring the levee up to current standard with Federal and state flood protection criteria, as well as provide opportunities for ecosystem restoration and public recreation. The U.S. Army Corps of Engineers (USACE) is the Federal lead agency under the National Environmental Policy Act and WSAFCA is the lead agency under the California Environmental Quality Act.

Public and Agency Input

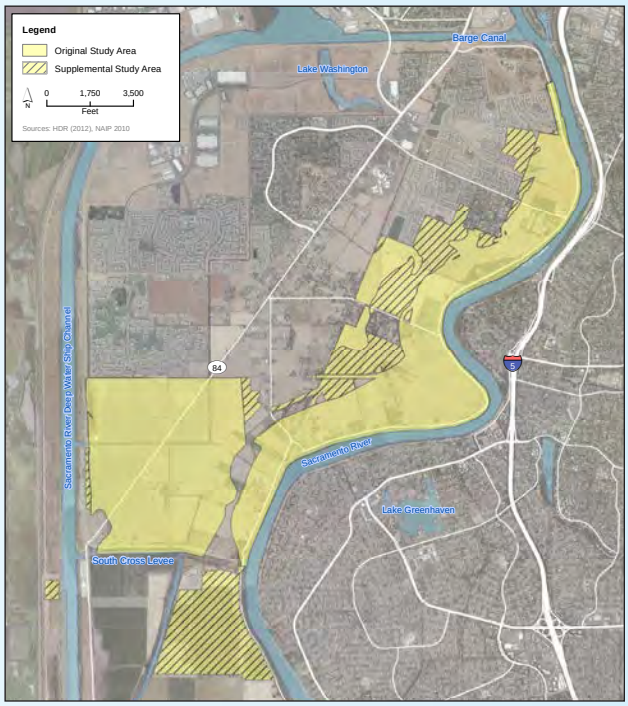
USACE and WSAFCA are requesting your input on the scope and content of the EIS/R for the EIP. All interested parties are invited to comment between Friday, March 8, 2013 and Monday, April 8, 2013. All comments must be received by Monday, April 8, 2013 at 5 p.m.

Date: Thursday, March 28, 2013

Time: 5:30 p.m. – 7:30 p.m.

Place: West Sacramento City Hall Galleria
1110 West Capitol Avenue
West Sacramento, CA 95691

A presentation will begin at 6 p.m.



If you cannot attend the meeting, you can learn more by visiting ***www.cityofwestsacramento.org/city/flood/southport_eip/***.

In addition to providing your input at the meeting, you can send or email your comments to:

Megan Smith, Project Manager
ICF International, 630 K Street, Suite 400
Sacramento, CA 95814
megan.smith@icfi.com

or

Ms. Tanis Toland
U.S. Army Corps of Engineers, Sacramento District Delta Programs Integration & Ecosystem Restoration
1325 J Street, Sacramento, CA 95814
tanis.j.toland@usace.army.mil

US Army Corps of Engineers
Sacramento District

WSAFCA
West Sacramento Area Flood Control Agency

Supplemental Notice of Preparation of an Environmental Impact Statement/Environmental Impact Report for the Southport Sacramento River Early Implementation Project

The West Sacramento Area Flood Control Agency (WSAFCA) is proposing the Southport Sacramento River Early Implementation Project (EIP) to implement flood risk–reduction measures along the Sacramento River South Levee in the city of West Sacramento, Yolo County, California. On August 26, 2011, WSAFCA issued a Notice of Preparation (NOP) for the EIP and undertook a 30-day public comment period. Since that time, WSAFCA has expanded the EIP study area to include additional soil borrow sites that may be employed to provide borrow material needed to construct the EIP. The study area encompasses the area of levee risk-reduction measure construction along the river corridor, roadway construction and/or relocation, and potential soil borrow sites. The construction area extends along the right (west) bank of the Sacramento River south of the Barge Canal downstream approximately 6 miles to the South Cross Levee, adjacent to the Southport community of West Sacramento. The potential soil borrow sites are located to the east and west of southern Jefferson Blvd.; adjacent to the construction area; immediately west of the Deep Water Ship Channel; and south of the South Cross Levee.

The project would bring the levee up to standard with Federal and state flood protection criteria, as well as providing opportunities for ecosystem restoration and public recreation. The U.S. Army Corps of Engineers (USACE), acting as the Federal lead agency under the National Environmental Policy Act (NEPA), and WSAFCA, acting as lead agency under the California Environmental Quality Act (CEQA), determined that a project-level Environmental Impact Statement/Environmental Impact Report (EIS/EIR) should be prepared for the project.

Comments Solicited. USACE and WSAFCA are requesting your input on the scope and content of the Southport Sacramento River EIP EIS/EIR. All interested parties are invited to comment for a period of 30 days, beginning Friday, March 8, 2013. Please send comments by e mail or standard mail to a contact below by 5 p.m., Monday, April 8, 2013.

The public can meet with lead agency representatives and provide written comments at a public scoping meeting to be held March 28, 2013 at 5:30 p.m. at the City of West Sacramento City Hall Galleria Room, 1110 W. Capitol Ave., West Sacramento, CA 95691. A presentation will begin at 6 p.m.

If commenting on behalf of a public agency or non-governmental organization, please include the name of a contact person.

Megan Smith, Project Manager
ICF International
630 K Street, Suite 400
Sacramento, CA 95814
Email: megan.smith@icfi.com

or

Ms. Tanis Toland
U.S. Army Corps of Engineers, Sacramento District
Delta Programs Integration & Ecosystem Restoration
1325 J Street
Sacramento, CA 95814
Email: tanis.j.toland@usace.army.mil

Attachment B

- Display boards
- Fact sheet
- Comment card

Welcome to the Southport Sacramento River Early Implementation Project Supplemental Scoping Meeting

March 28, 2013

Southport Board - Welcome.indd 1 3/25/13 12:00 PM

West Sacramento Levee Improvements Program Purpose & the Southport Sacramento River Early Implementation Project

In 2007 the West Sacramento Area Flood Control Agency (WSAFCA) initiated the West Sacramento Levee Improvements Program (WSLIP) to reduce the risk of a catastrophic flood event in West Sacramento. The City of West Sacramento, as part of WSAFCA, and in collaboration with the California Department of Water Resources, embarked on a comprehensive evaluation of the levees protecting the city to determine deficiencies and develop treatments. As the agency with authority over jurisdictional waters of the United States and alterations to Federal levees, the U.S. Army Corps of Engineers (USACE) acts as the lead agency as it relates to the Federal environmental review process. Based on findings of the levee evaluation, the objectives of the WSLIP are to:

- Achieve a minimum of "200-year" level of flood protection for the City of West Sacramento in line with Federal and state flood protection criteria;
- Construct levee improvements as soon as possible to reduce flood risk;
- Construct levee improvements that are politically, socially, and environmentally acceptable; and
- Provide recreational and open space elements for the city that are compatible with flood improvement measures.

West Sacramento Area Flood Control Agency (WSAFCA) is a Joint Powers Authority created in 1994 to coordinate planning and construction of flood protection facilities within its boundaries and to finance the local share of flood control projects. Member agencies of WSAFCA are the City of West Sacramento, Reclamation District 900, and Reclamation District 537.

USACE approval is needed for alterations to Federal levees under Section 14 of the Rivers and Harbors Act; discharge of dredge or fill materials into jurisdictional waters of the United States under Section 404 of the Clean Water Act; and activities in navigable waters under Section 10 of The Rivers and Harbors Act.

WSAFCA is proposing the Southport Sacramento River Early Implementation Project (Southport EIP) to implement flood risk-reduction measures along approximately 6 miles of the Sacramento River South Levee. This is the fourth levee flood risk management project (following the I-Street Bridge, CHP Academy, and The Rivers projects) under the WSLIP and would address under-and through-seepage, erosion, and slope instability. The Southport EIP may also provide opportunities for ecosystem restoration and public recreation. The Southport EIP would bring the levee up to current standard with Federal and state flood risk-reduction criteria.

In 2011, WSAFCA and USACE issued a Notice of Preparation and Notice of Intent, respectively, to prepare a joint environmental impact statement/environmental impact report (EIS/EIR) for the Southport EIP and held a 30-day comment period. Since then, WSAFCA has expanded the Southport EIP study area to include additional soil borrow sites that may be needed to construct the Southport EIP and a modified roadway alignment. Because WSAFCA increased the study area, a second 30-day comment period is now being held to solicit additional comments on the Southport EIP that are inclusive of the expanded study area. After considering all comments received during both scoping periods, WSAFCA and USACE will complete and release the draft EIS/EIR, available for public review in summer 2013.

Board 1A - Purpose.indd 1 3/29/13 11:28 AM

How Did We Get Here?

Over the past decades, there have been several flood risk evaluations and risk management efforts in the city of West Sacramento.

1986-1987: Significant rainfall event occurs in Sacramento region; U.S. Army Corps of Engineers (USACE) recommends significant flood risk management efforts in West Sacramento.

1987-1990: City obtains Federal funding and authorization for two levee flood risk-reduction projects.

1990-1993: Sacramento Urban Levee Reconstruction Project completes building of stability berm along the Sacramento River in Southport. Costs were $9 million; local share was $800,000.

1994: West Sacramento Flood Control Agency (WSAFCA) is created to coordinate, fund, and construct major flood risk-reduction projects, and spearhead West Sacramento-area flood risk management effort.

1997: Significant rainfall event occurs in Sacramento region and levees sustain damage.

1999-2002: USACE's West Sacramento Project strengthened five miles of levees adjacent to the Sacramento and Yolo bypasses. Costs were approximately $32.1 million; local share was $3.6 million.

2005: USACE issues new levee design standards.

2006: State performs critical erosion repairs on three sites in West Sacramento.

2006: WSAFCA, in collaboration with California Department of Water Resources, embarks on comprehensive evaluation of levees.

2007: WSAFCA proposes the West Sacramento Levee Improvements Program (WSLIP). This is a comprehensive program to bring the city's levees up to current standards.

2007: USACE constructs a seepage berm at Davis Road and South River Road under Public Law 84-99.

2008: The I Street Bridge early implementation project (EIP) is constructed under WSLIP after USACE approved Section 408 permission requested by WSAFCA. The Rivers and CHP Academy EIPs are proposed.

2009/2010: A joint USACE and WSAFCA environmental scoping meeting is held for the WSLIP, including The Rivers and CHP Academy EIPs. The WSLIP Draft EIS/EIR is released.

Winter 2010: USACE begins construction on a setback levee project along the west bank of the Sacramento River south of the Stone Locks, as part of the Sacramento River Bank Protection Project. Anticipated completion is fall 2013.

Summer 2010: WSAFCA and USACE begin planning the Southport Sacramento River EIP (Southport EIP).

Mid-2011: The Rivers and CHP Academy EIPs complete environmental review and are constructed.

Summer 2011: The environmental review process for the Southport EIP is initiated. Initial public scoping is held.

March 2013: The Southport EIP study area is expanded to include additional borrow sites. A second round of public scoping is conducted.

Board 1B - How Get Here.indd 1 3/25/13 11:25 AM

West Sacramento Area Levee Projects

During the past 10 years, several key flood risk management projects have been initiated or constructed by various government agencies or agency partnerships in the city of West Sacramento. Below is a list of major projects that are in the planning stage, under construction or that have been constructed.

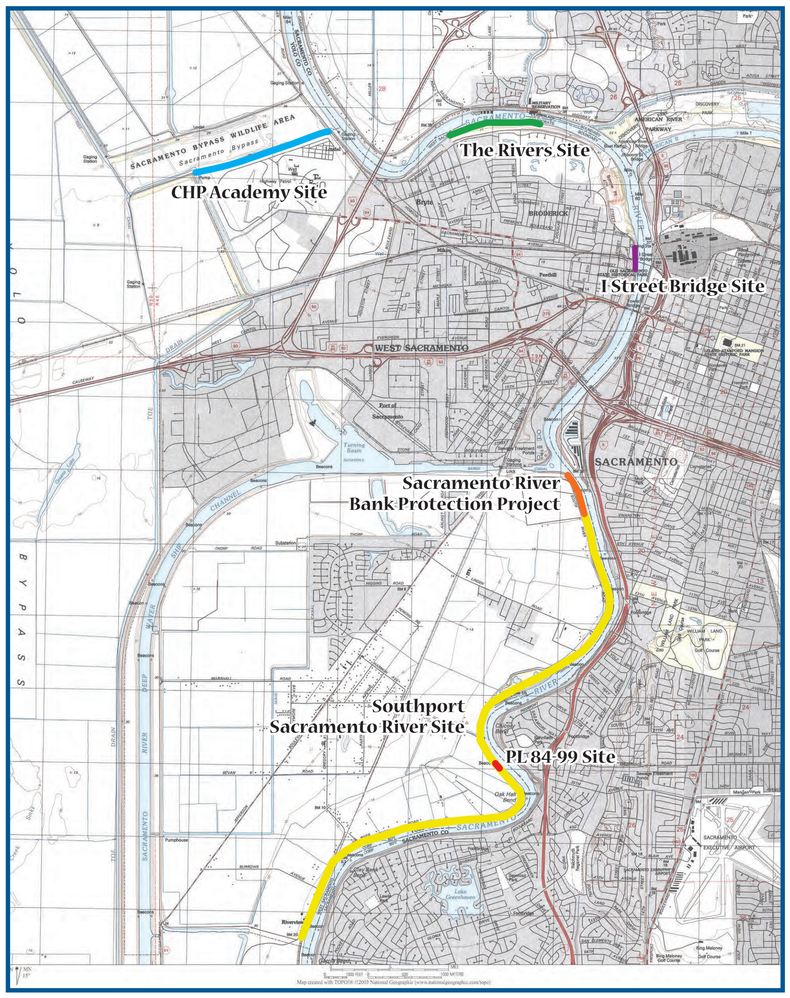
I Street Bridge Site. Construction of the I Street Bridge Early Implementation Project (EIP) was completed in November 2008. The treatment consisted of a 475-foot-long slurry wall approximately 37 feet in depth to correct seepage deficiencies. The City's Riverwalk extension project commenced soon after construction was completed.

CHP Academy Site. Construction of the CHP Academy EIP was completed in 2011. This EIP treated 6,500 feet of levee along the Sacramento Bypass to address through-seepage, under-seepage, and levee geometry and instability.

The Rivers Site. Construction of The Rivers EIP was completed in 2011. This EIP treated approximately 3,000 feet of the Sacramento River North Levee, just north of the confluence of the Sacramento and American rivers, to address levee geometry, stability, and under-seepage.

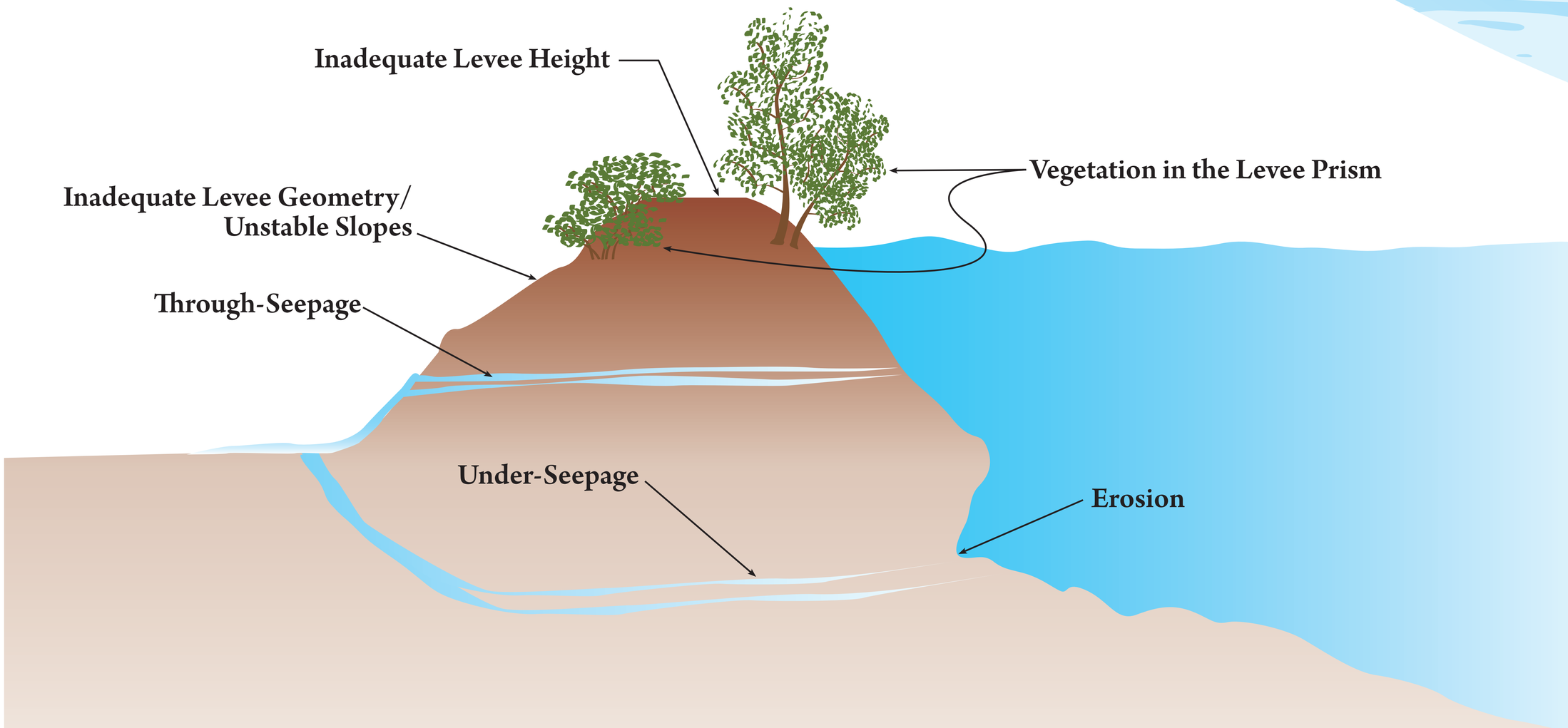
Southport Sacramento River Site. The Southport Sacramento River EIP, if constructed, would implement flood risk-reduction measures along 6 miles of the levee along the west bank of the Sacramento River. It would address under-and through-seepage, erosion, and slope instability. The draft environmental impact statement/environmental impact report for this EIP will be released in summer 2013.

Sacramento River Bank Protection Project. Construction on this project began in December 2010, including implementation of a setback levee along the west bank of the Sacramento River, just south of the Stone Locks. This effort is led by the U.S. Army Corps of Engineers under the Sacramento River Bank Protection Project, separate from the efforts of the West Sacramento Area Flood Control Agency. The scheduled completion date is fall 2013.



Board 1C - West Sac Levee Projects.indd 1 3/22/13 3:07 PM

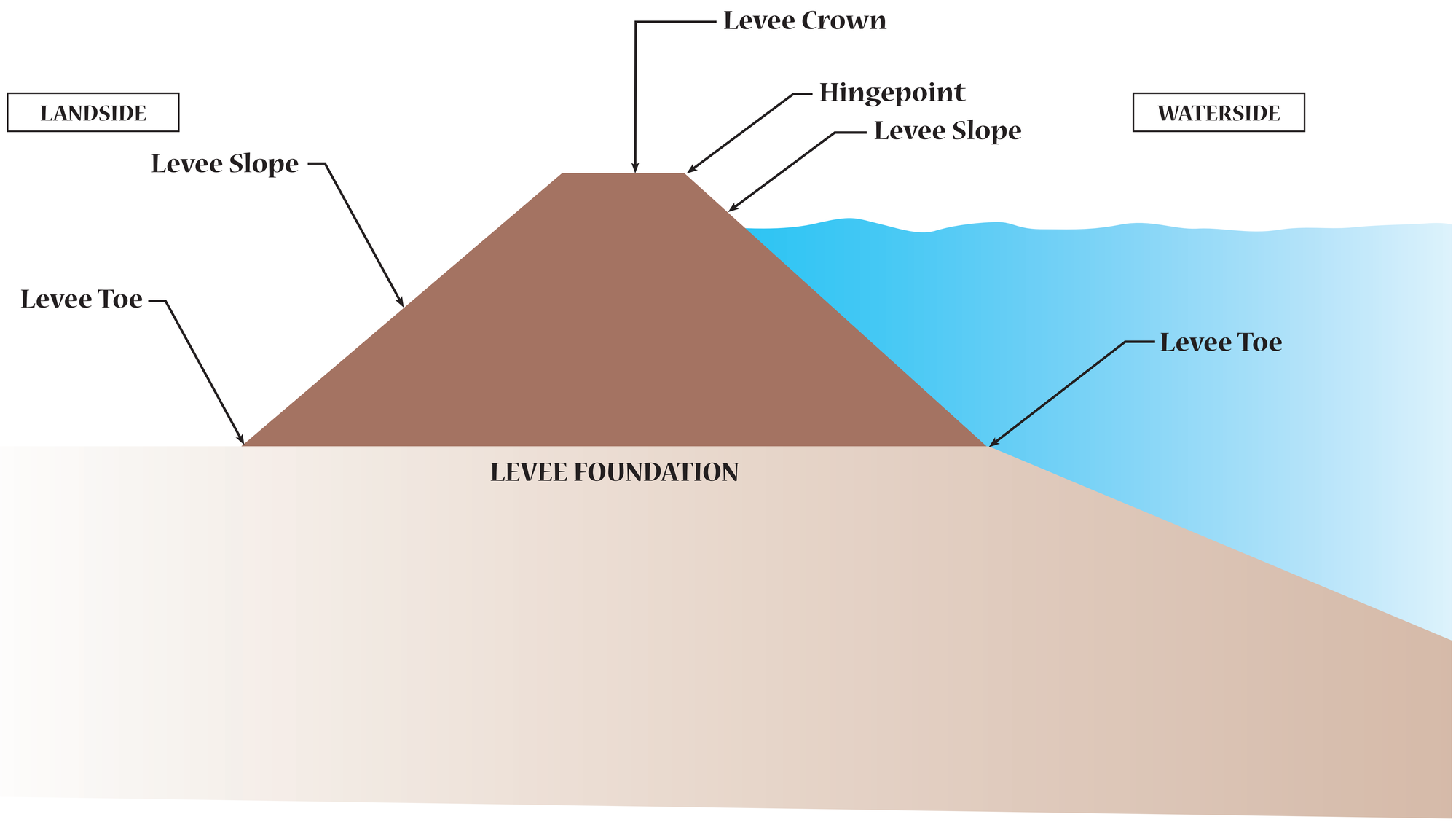
Typical Levee Deficiencies



- Inadequate Levee Geometry/Unstable Slopes – irregular or overly steep slopes compromise the levee structure
- Inadequate levee height – levee height may be too low relative to predicted water levels
- Vegetation in the levee prism – can lead to levee instability and hinder levee monitoring and maintenance
- Erosion – water flow, wakes and waves, remove soil material, damaging the levee
- Seepage

Board 1D - Typical Deficiencies.indd 1
3/21/13 1:56 PM

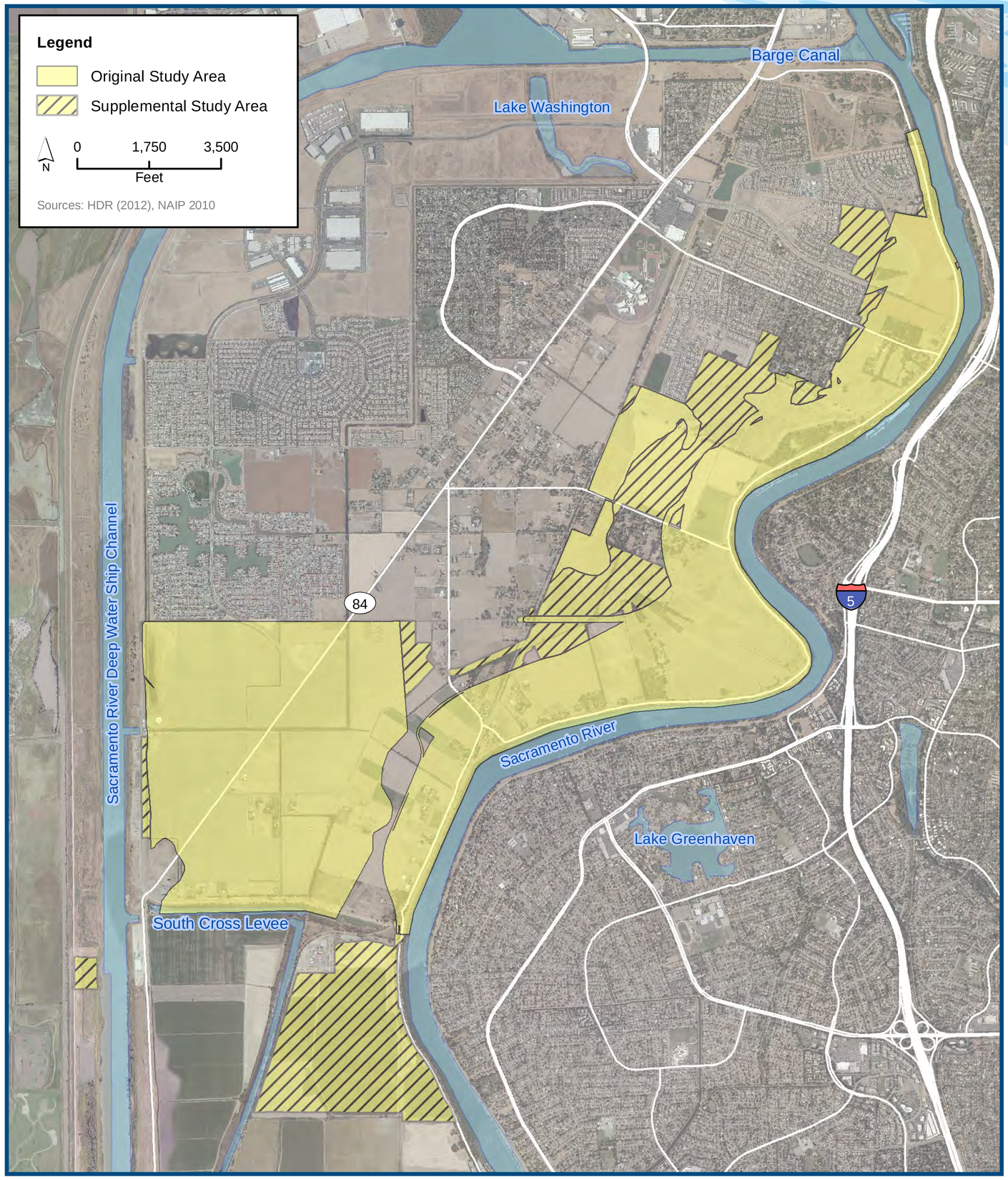
An "Inside Look" at a Levee



Board 1E - Inside Look.indd 1 3/22/13 2:32 PM

The Expanded EIP Study Area

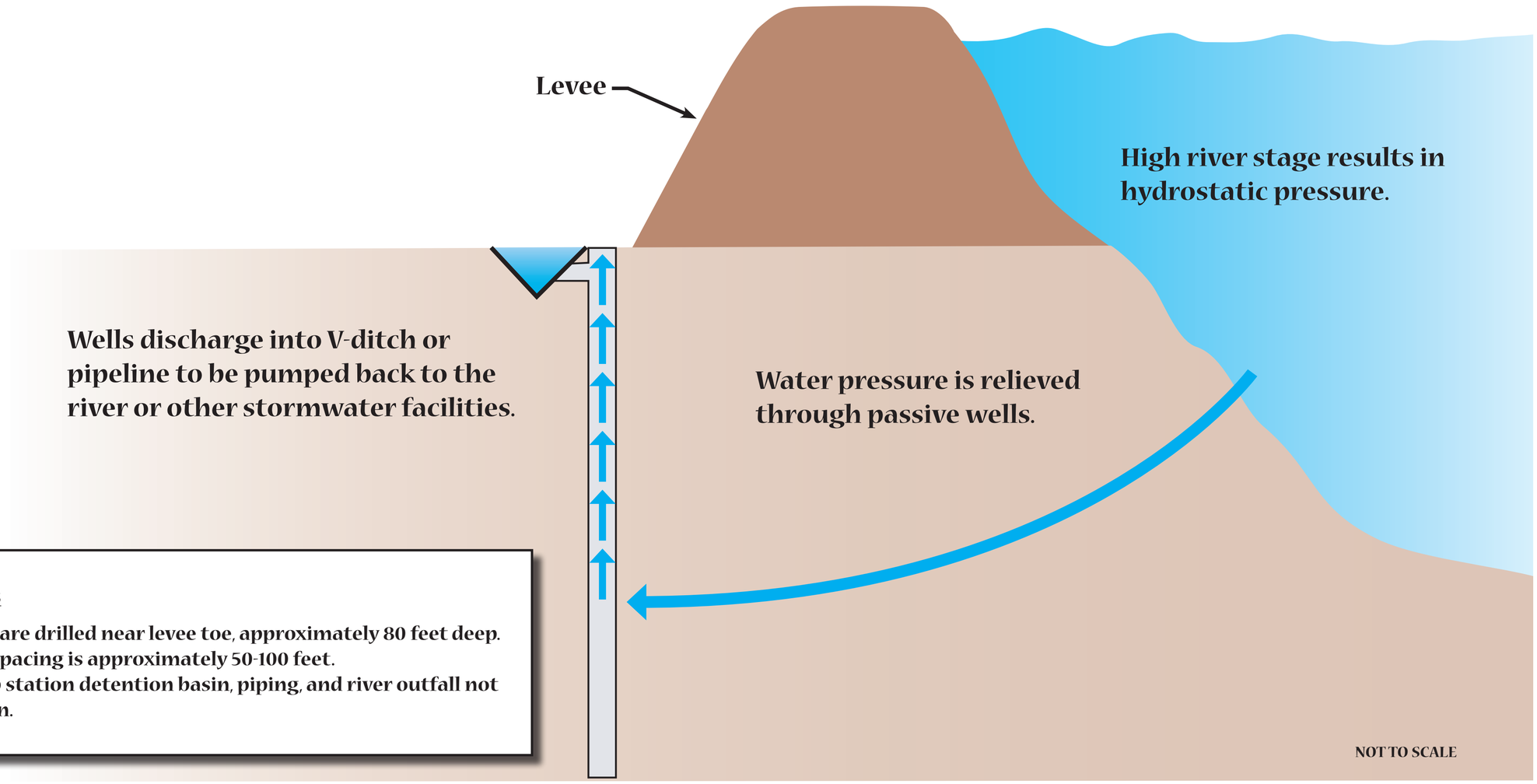
Since the initiation of the Southport Sacramento River Early Implementation Project (EIP) in 2011, the West Sacramento Area Flood Control Agency expanded the study area to include additional soil borrow sites that may be needed to construct the EIP. The expanded study area includes the area of levee risk-reduction measure construction, roadway construction and/or relocation, and potential soil borrow sites. The map at right illustrates both the original and supplemental study areas.



Board 1F - Expanded Study Area.indd 1
3/22/13 3:30 PM

Relief Wells

Concept: Water pressure is relieved via passive wells, which direct water discharge into a collection system.



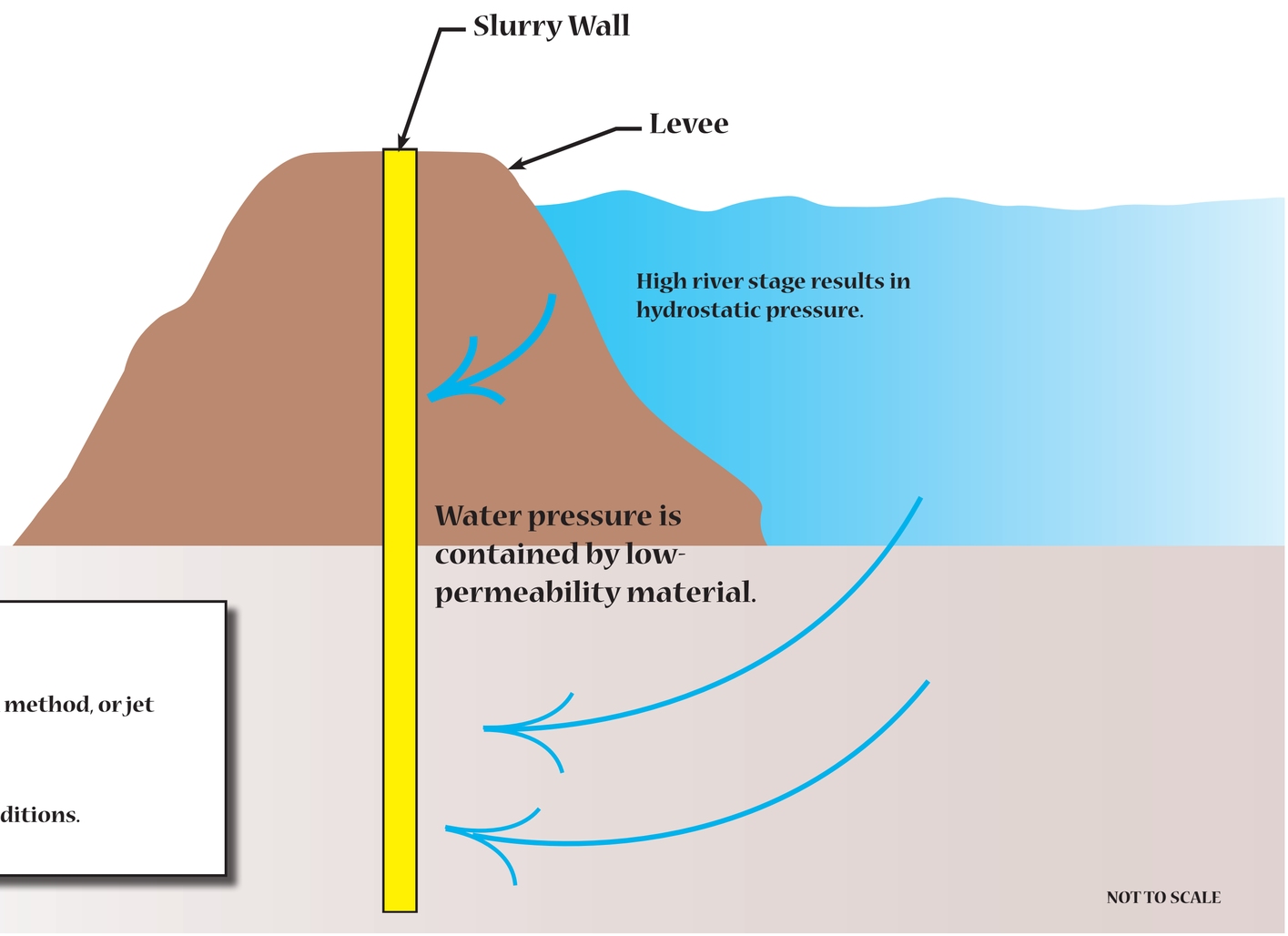
DETAILS

- Wells are drilled near levee toe, approximately 80 feet deep.
- Well spacing is approximately 50-100 feet.
- Pump station detention basin, piping, and river outfall not shown.

Board 2A - Relief Well.indd 1
3/22/13 10:39 AM

Slurry Cutoff Wall

Concept: Water pressure is contained and dispersed by a low-permeability wall constructed within the levee cross section.



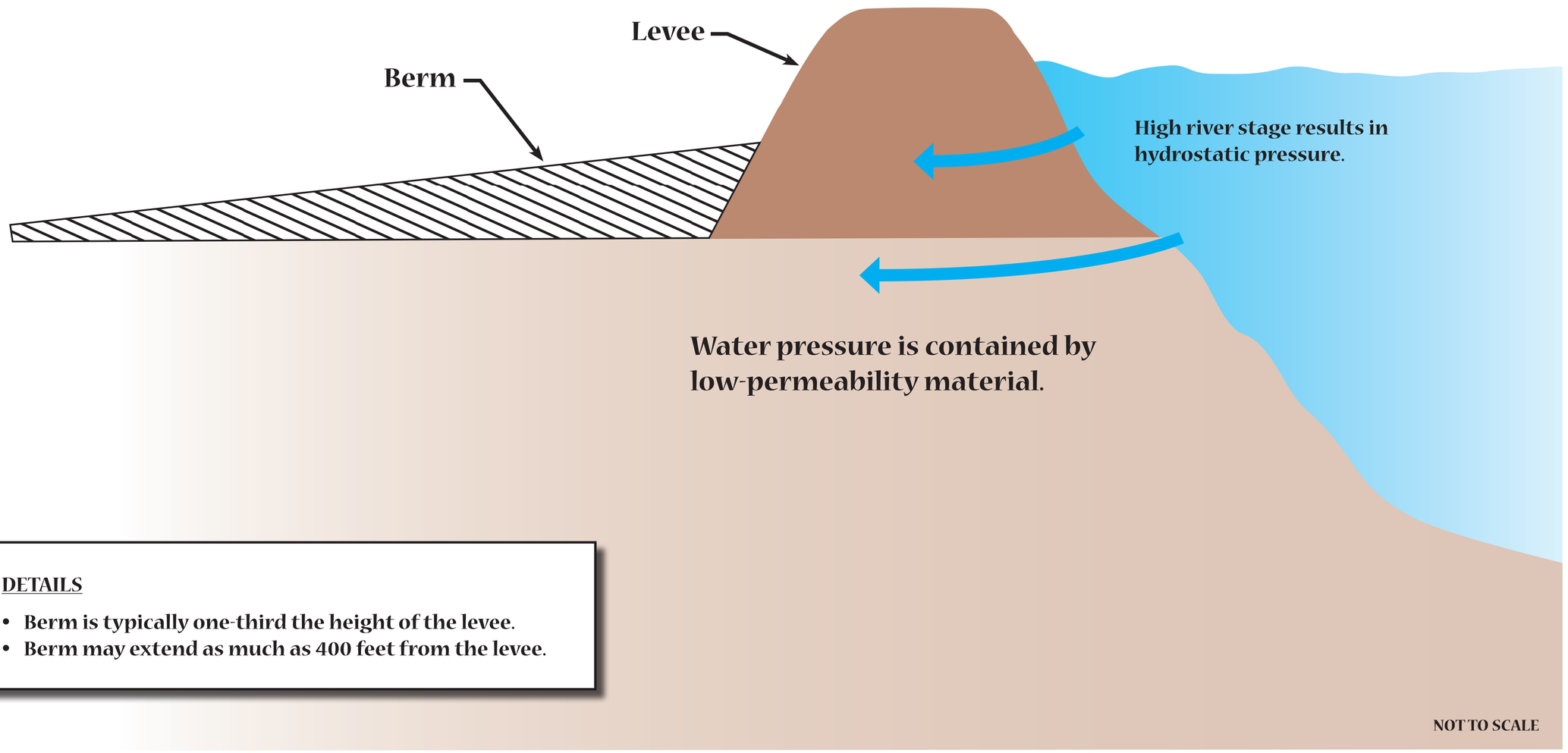
DETAILS

- Constructed via traditional slot trench, deep soil mix method, or jet grouting.
- Wall is approximately 3 ft wide.
- Wall depths can vary widely based on subsurface conditions.

Board 2B - Slurry Wall.indd 1
3/22/13 12:32 PM

Seepage Berm

Concept: Water pressure is contained and dispersed by a thickened soil layer.



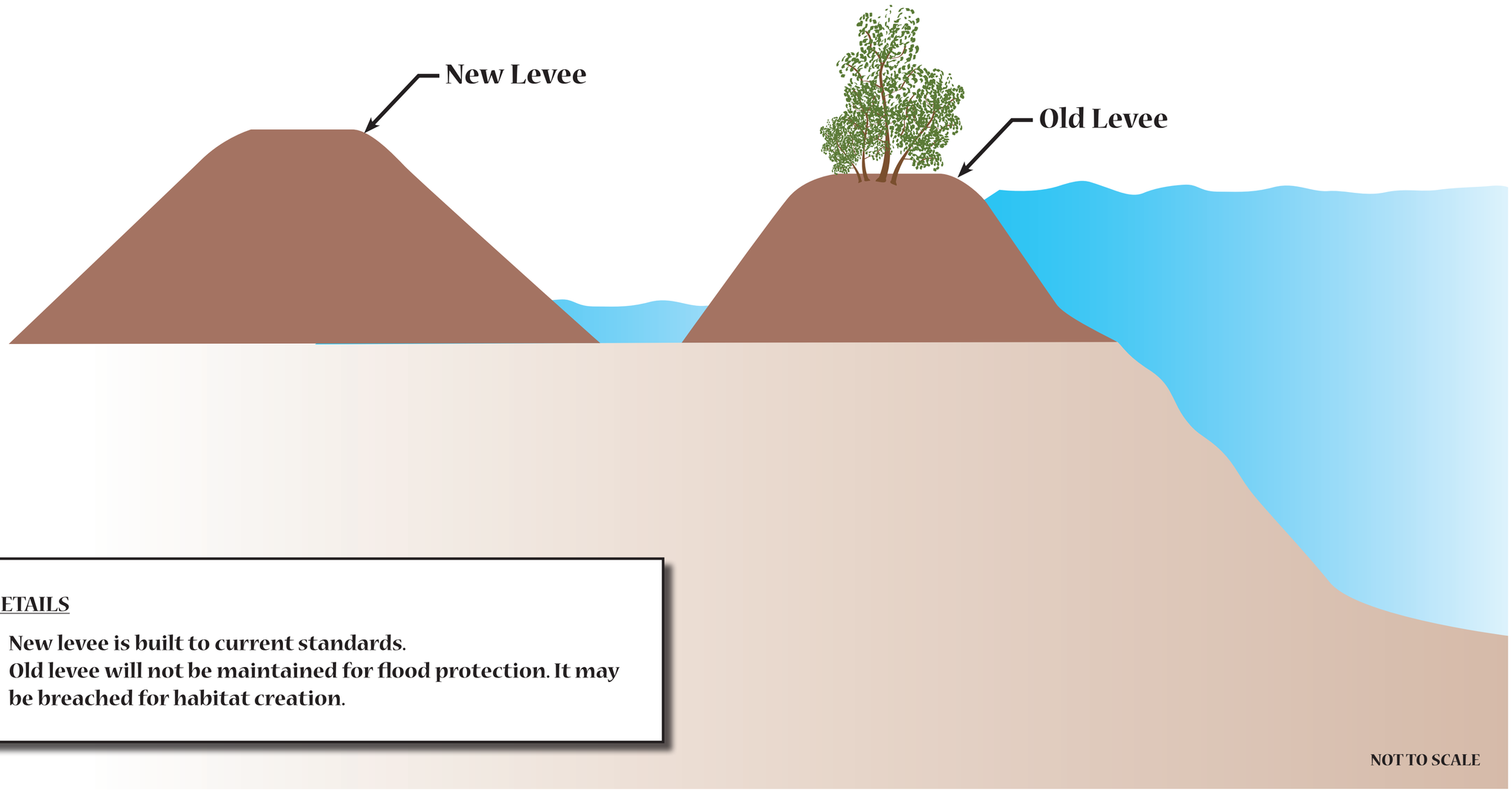
DETAILS

- Berm is typically one-third the height of the levee.
- Berm may extend as much as 400 feet from the levee.

Board 2C - Seepage Berm.indd 1
3/22/13 10:41 AM

Setback Levee

Concept: A new levee is built toward the landside of an existing levee where the existing levee is not readily repairable or where more flooding capacity is desired.



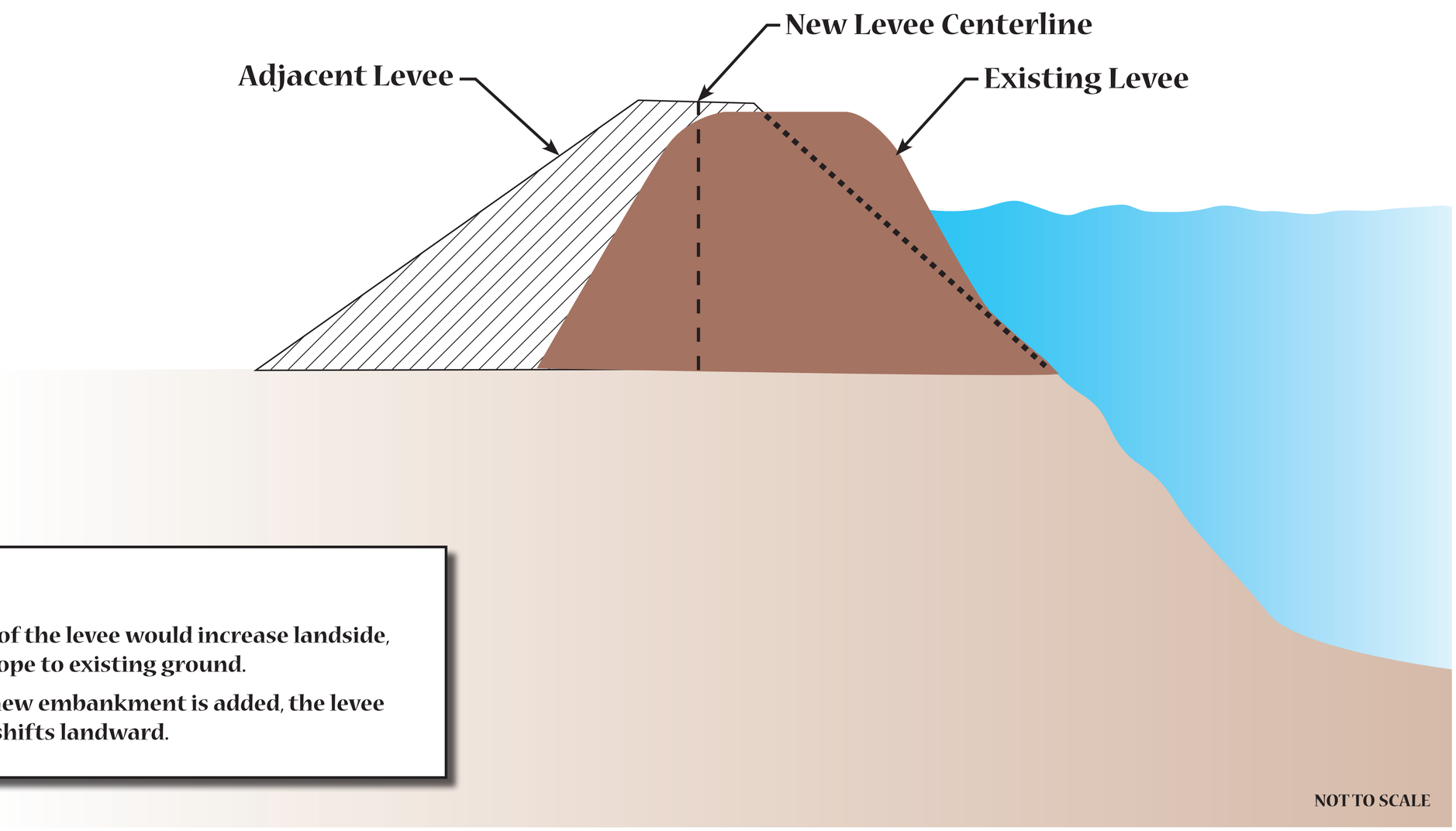
DETAILS

- New levee is built to current standards.
- Old levee will not be maintained for flood protection. It may be breached for habitat creation.

Board 2D - Setback Levee.indd 1
3/22/13 10:43 AM

Adjacent Levee

Concept: A new embankment strengthens the existing levee and enlarges the slopes.



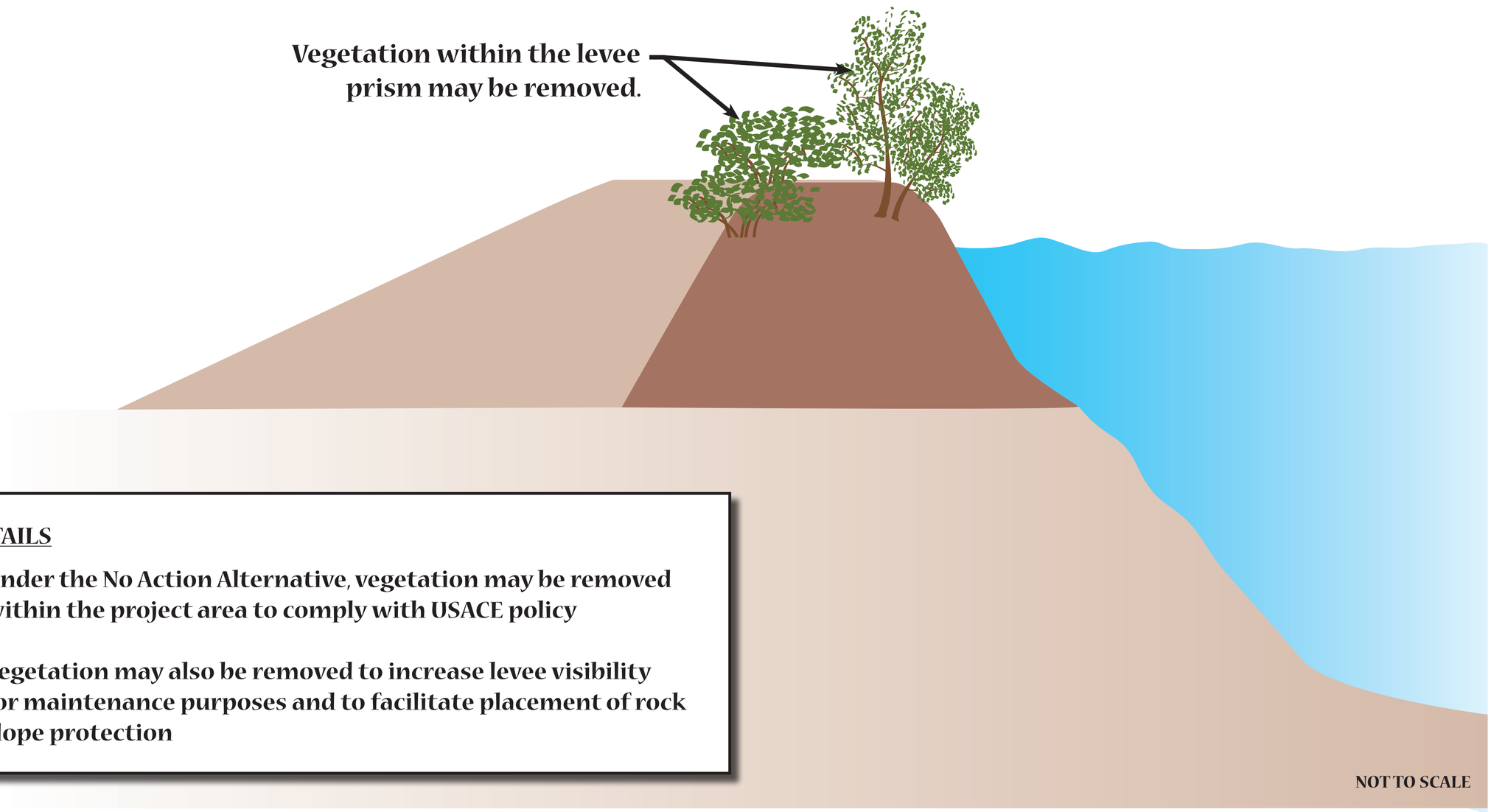
DETAILS

- The crown of the levee would increase landside, with a 3:1 slope to existing ground.
- When the new embankment is added, the levee centerline shifts landward.

Board 2E - Adjacent Levee.indd 1
3/22/13 10:45 AM

Vegetation Removal

Concept: Vegetation within the levee prism may inhibit levee maintenance, visibility, and performance.



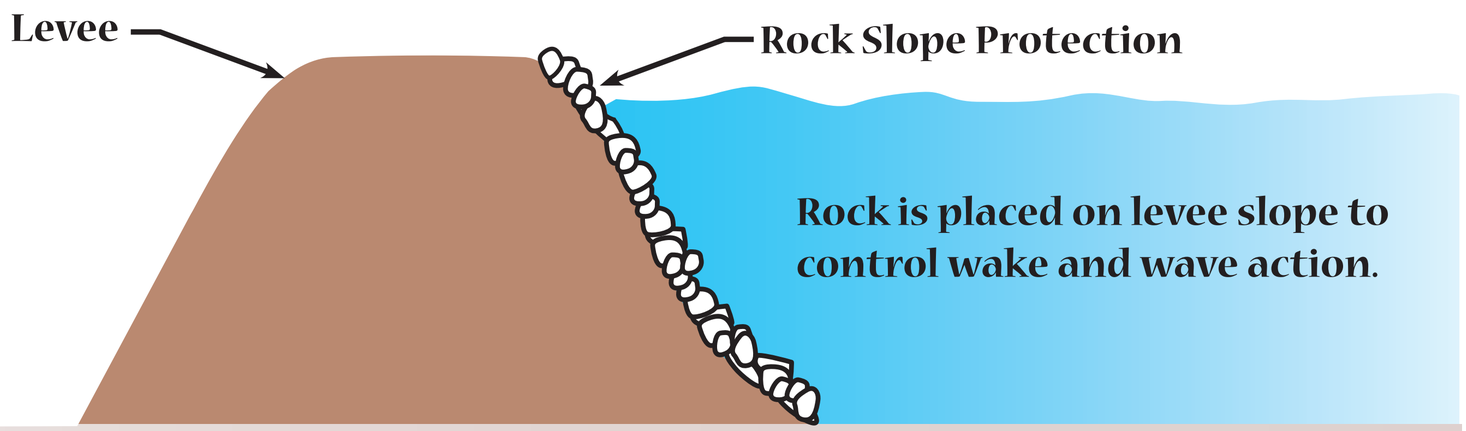
DETAILS

- Under the No Action Alternative, vegetation may be removed within the project area to comply with USACE policy
- Vegetation may also be removed to increase levee visibility for maintenance purposes and to facilitate placement of rock slope protection

Board 2F - Veg Removal.indd 1
3/25/13 11:27 AM

Rock Slope Protection

Concept: Water-side erosion is prevented by placement of rock.



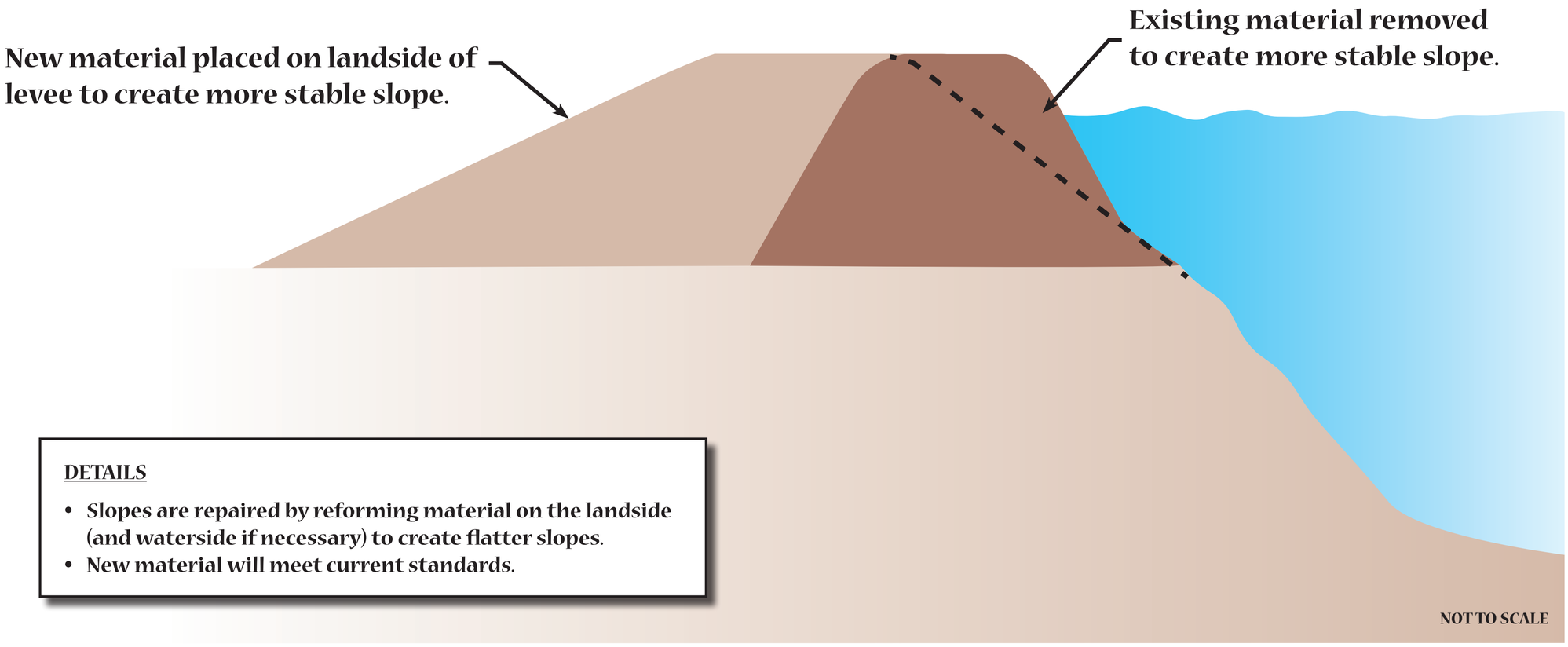
DETAILS

- Rock is typically 8 to 18 inches in diameter, placed in a 12 to 24-inch layer.
- Rock could be covered by soil and/or non-woody vegetation.

Board 2G - Rock Slope Protection.indd 1
3/22/13 10:48 AM

Slope Flattening

Concept: Flatter slopes are more stable and less susceptible to erosion.



DETAILS

- Slopes are repaired by reforming material on the landside (and waterside if necessary) to create flatter slopes.
- New material will meet current standards.

Board 2H - Slope Flattening.indd 1 3/22/13 10:49 AM

About NEPA and CEQA

The purpose of the National Environmental Policy Act (NEPA) is to include environmental consideration into Federal agency planning and action. It also ensures that a proposed activity's potential effects on both the natural and built environments are analyzed and disclosed to the public. This information is presented in an Environmental Impact Statement (EIS). NEPA serves to inform Federal agencies' planning and actions.

Similarly, the California Environmental Quality Act (CEQA) requires the preparation of an Environmental Impact Report (EIR) for non-exempt projects where there is substantial evidence that the project may cause a significant environmental impact. EIRs disclose the effects of the project to agencies and the public and serve as a decision-making aid for governing bodies.

While the West Sacramento Area Flood Control Agency is proposing the project, U.S. Army Corps of Engineers' approval is needed for alterations to Federal levees under Section 14 of the Rivers and Harbors Act; discharge of dredge or fill materials into jurisdictional waters of the United States under Section 404 of the Clean Water Act; and activities in navigable waters under Section 10 of The Rivers and Harbors Act. Therefore, compliance with both NEPA and CEQA is required.

A joint EIS/EIR is often prepared when there is both Federal and state agency interest in an activity, or when a state agency needs permission to perform an action under Federal jurisdiction, as is the case with the Southport Sacramento River Early Implementation Project (Southport EIP). The development of the Draft EIS/EIR is underway for the Southport EIP and will be released in summer 2013.

Board 3A - NEPA_CEQA.indd 1 3/22/13 3:36 PM

About the Scoping Process

Scoping is a process used to inform the public of a proposed activity and help shape the scope of an environmental impact statement/environmental impact report (EIS/EIR). During the scoping process lead agencies solicit public input regarding the issues, impacts, and alternatives to be addressed in the EIS/EIR.

Scoping can be particularly informative in a flood risk-reduction project because the local residents could have knowledge about the performance of a levee that the agencies are unaware of, such as locations of under-seepage, boils, or areas of general poor levee performance.

Comments received from scoping will inform the development of the project alternatives; define the environment and resources potentially affected by the alternative implementation; and analyze the resulting effects. The affected environment broadly includes physical, biological, social, and economic topic areas. Direct and indirect effects of project construction and long-term operations and maintenance are identified and analyzed. The effects of not implementing the project, called the No Action Alternative, are also analyzed.

When the project was initiated in 2011, a 30-day comment period on the scope of the EIS/EIR was opened, and two scoping meetings were held. Since then, the West Sacramento Area Flood Control Agency (WSAFCA) has expanded the Southport Sacramento River Early Implementation Project (Southport EIP) study area to include additional soil borrow sites that may be needed to construct the Southport EIP and a modified roadway alignment. The expanded study area includes the area of flood risk-reduction measure construction; roadway construction and/or relocation; and potential soil borrow sites. A second 30-day comment period is now being held, from March 8, 2013, to April 8, 2013, to solicit additional comments that are inclusive of the expanded study area. After considering all comments received during both scoping periods, WSAFCA and the U.S. Army Corps of Engineers will complete and release the draft EIS/EIR, available for public review in summer 2013.

Board 3B - Scoping Process.indd 1 3/22/13 3:37 PM

Ecosystem Restoration Opportunities & Mitigation

While the highest priority of the Southport Sacramento River Early Implementation Project (Southport EIP) is to implement flood risk-reduction measures, the project would also allow the West Sacramento Area Flood Control Agency (WSAFCA) to partially or fully mitigate many of the project's environmental impacts onsite. In addition, it may provide an opportunity for restoration of historic habitat within the project area.

Potential Habitat Restoration Activities

The goal of restoration design is to create self-sustaining, high-value habitats. As part of the Southport EIP, habitat would be created to replace that which may be lost during construction; this minimum level of habitat creation is required under the National Environmental Policy Act and California Environmental Quality Act and is considered mitigation. Where space within the project area is available, additional restoration could be undertaken that would restore habitat to historical conditions. Likely objectives for habitat mitigation and restoration include:

- Mitigation for temporary and permanent impacts on protected land cover types
- Mitigation for temporary and permanent impacts to special-status species and potential habitat for these species
- Restoration of portions of the historic Sacramento River floodplain through construction of a setback levee
- Restoration of riparian and oak woodland habitat on the restored floodplain
- Restoration of grasslands on the restored floodplain, setback levee, seepage berm, and other disturbed areas

Alternatives 2, 4, and 5, which primarily use a setback levee, include an expanded wildlife habitat restoration element through the use of offset floodplain areas. This term refers to the expanded floodway on the waterside of the proposed setback levee. Project activities in this area would include borrow excavation, grading, and floodplain and habitat restoration. The offset floodplain area mitigates the losses of existing habitat values due to project effects, as well as maximizes the potential habitat value in the Sacramento River floodplain. The amount of onsite habitat mitigation and restoration that could be implemented would depend on the alternative selected.

Board 3C - Ecosystem Restoration.indd 1 3/25/13 11:28 AM

Recreation Opportunities

The highest priority of the Southport Sacramento River Early Implementation Project is to implement flood risk-reduction measures. However, where it is compatible with those measures and operations, the West Sacramento Area Flood Control Agency (WSAFCA) is considering recreation improvements on, adjacent to, or near the levee.

South River Road, which runs atop the levee, provides easy access to the river and serves as a gateway to many recreational settings. Most of the levee supports a mature riparian forest that is attractive to recreationists. The scenic quality of the road and relatively light traffic make it a popular corridor for pedestrians, joggers, equestrians, cyclists, and anglers accessing the river.

WSAFCA seeks to improve conditions, accessibility, and maintenance of recreation sites along the levee. The current recreational uses listed above may be enhanced by adding parking or staging areas, seating along the corridor, picnic areas, and adventure play areas.

Ease of maintenance and increased accessibility are the two criteria that will be primarily used to evaluate implementation of enhanced recreation options. Recreation features proposed as part of each flood risk-reduction measure will be defined through the design and environmental processes and will be available for public review and comment when the draft environmental impact statement/environmental impact report is released in summer 2013.

Board 3D - Recreation Opportunities.indd 1 3/22/13 1:56 PM

Potential Environmental Issues

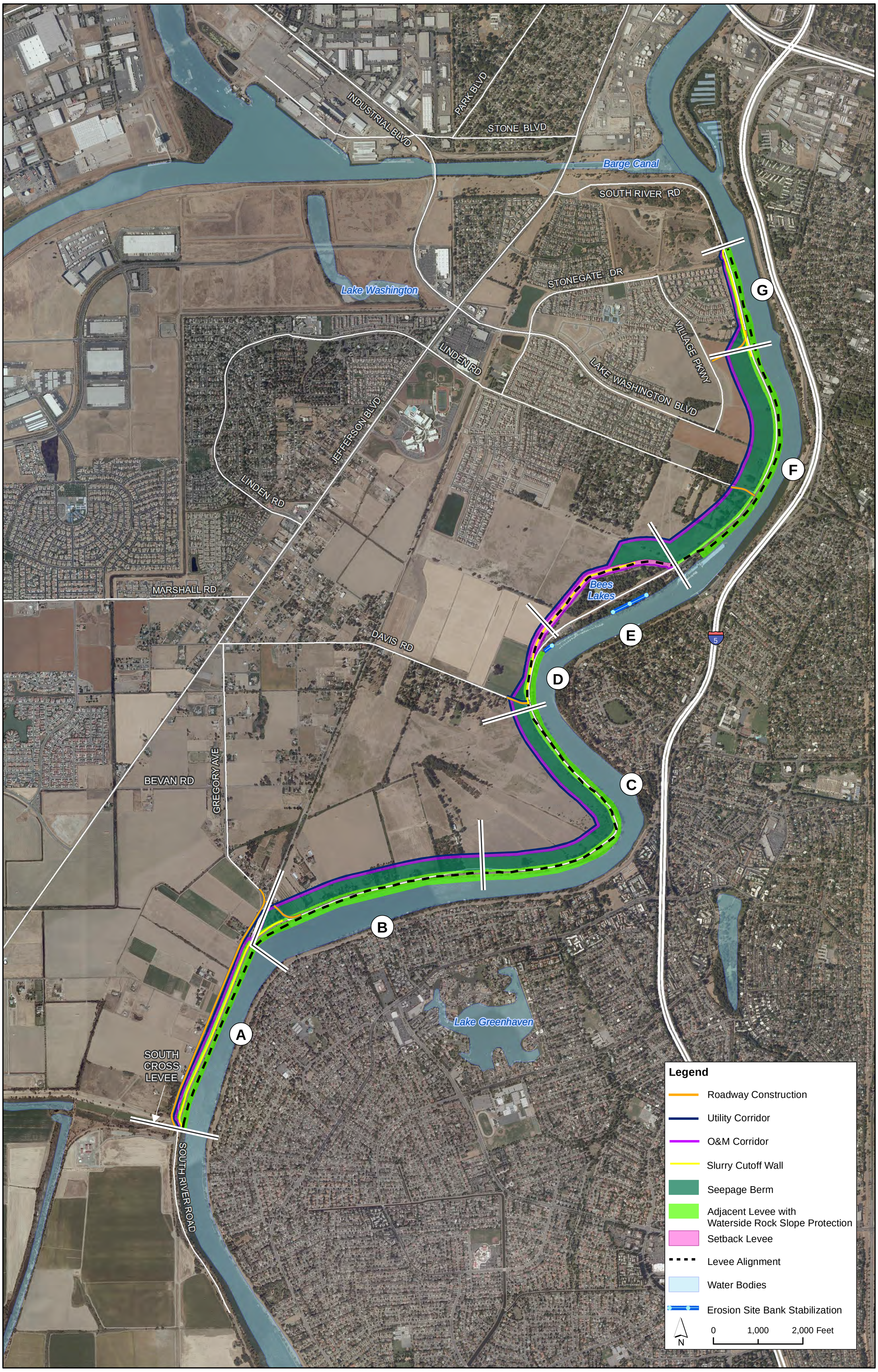
Implementation of the proposed Southport Sacramento River Early Implementation Project would likely affect both the natural and built environments. The effects will be evaluated and disclosed in the environmental impact statement/environmental impact report (EIS/EIR). Resources analyzed in the EIS/EIR will include, but are not limited to:

- **Aesthetics**
- **Biological resources**
- **Hazards and hazardous materials**
- **Socioeconomics & Environmental justice**
- **Agriculture**
- **Population & housing**
- **Cultural resources**
- **Mineral resources**
- **Hydrology/water quality**
- **Public services**
- **Transportation/traffic**
- **Air quality**
- **Geology & soils**
- **Land use/planning**
- **Recreation**
- **Noise**
- **Utilities/service systems**

Board 3E - Potential Enviro Issue.indd 1 3/22/13 3:40 PM

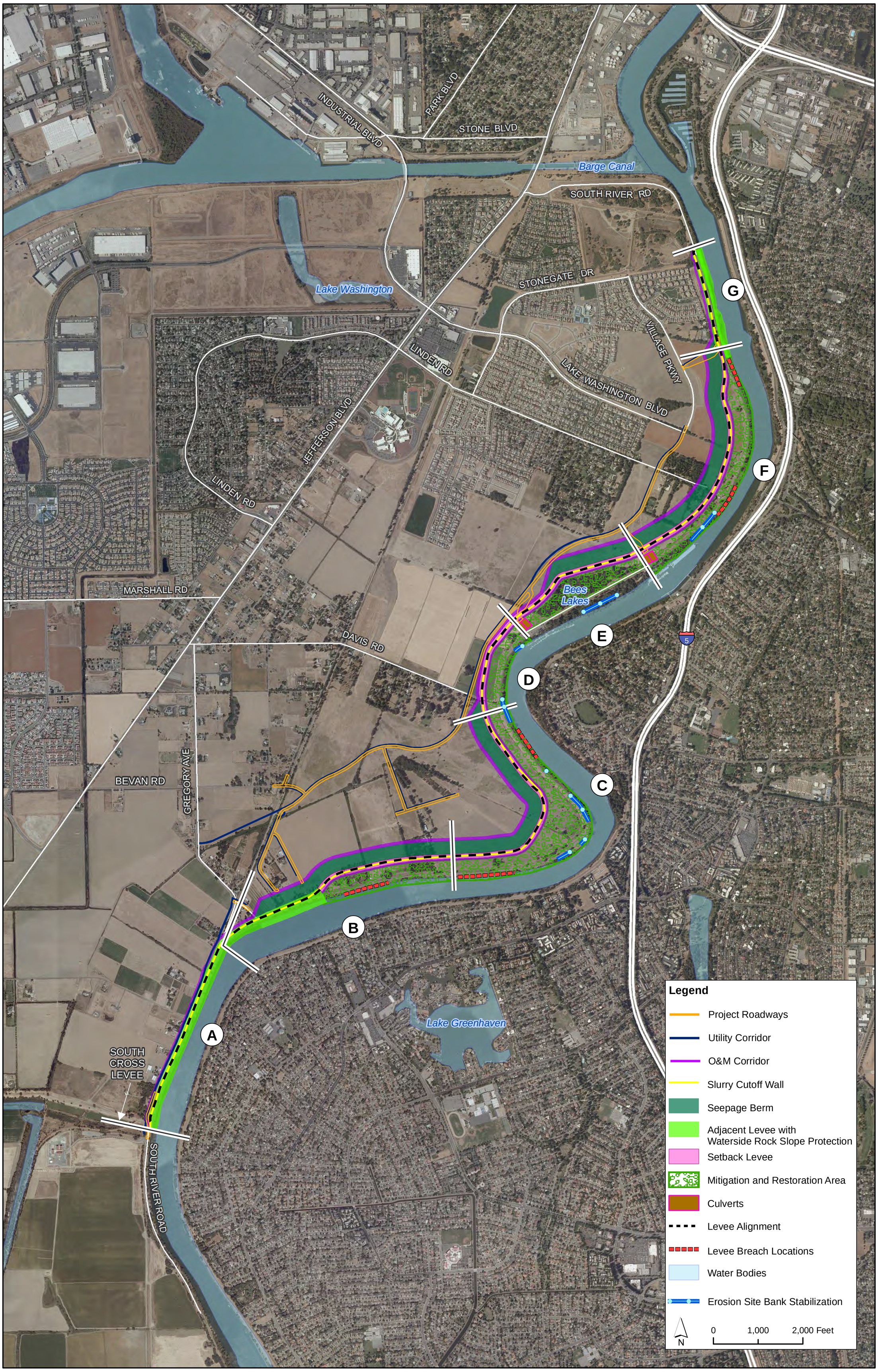
On South River Road, looking east and across the river toward Sacramento's Little Pocket neighborhood.
This levee stretch is included in the 6 miles proposed for upgrades under the Southport Sacramento River EIP.

Alternative 1.pdf 1 3/25/13 8:09 AM



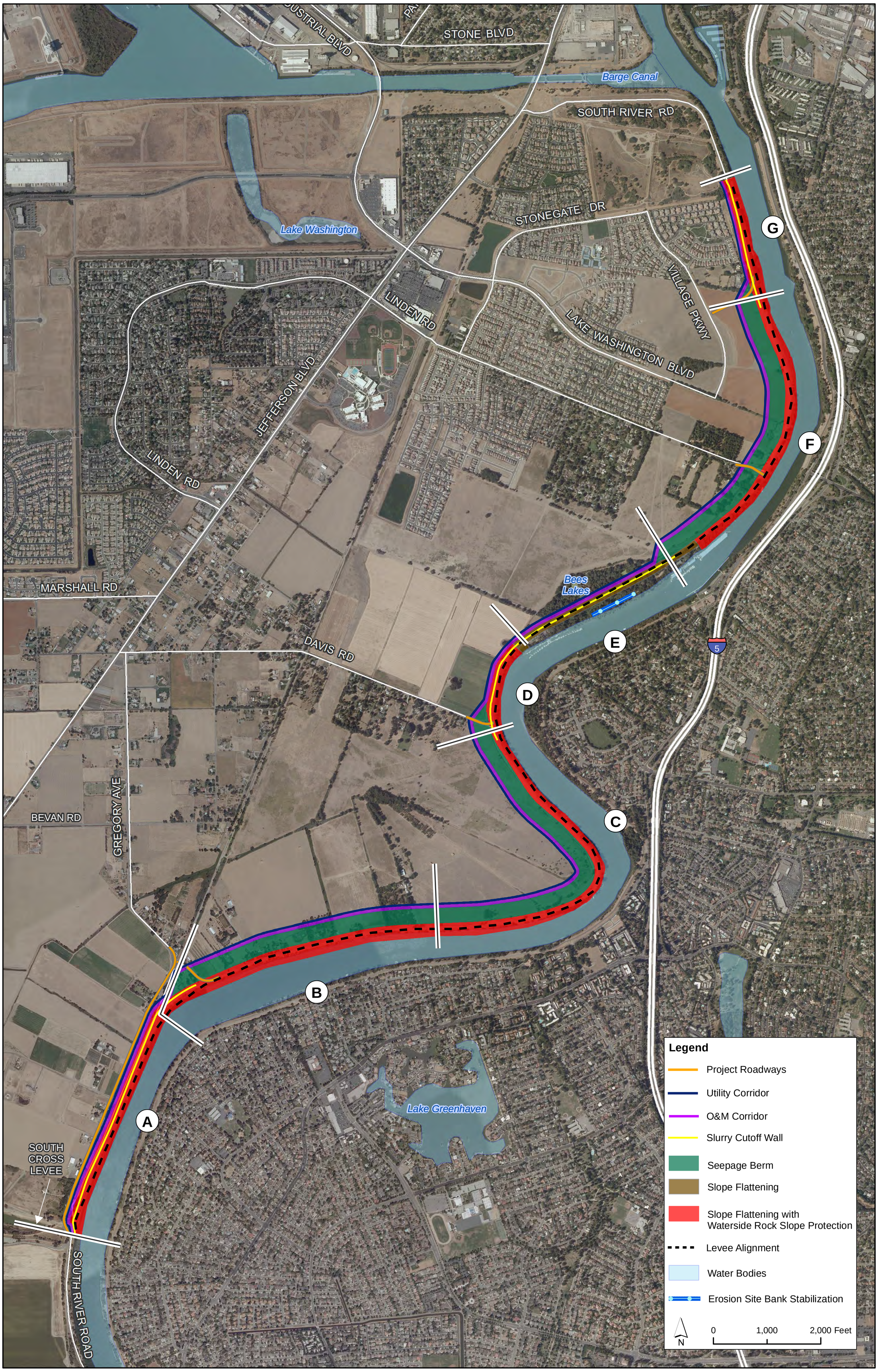
Southport Early Implementation Project Post-Construction Conditions - Alternative 1

Alternative 2.pdf 1 3/25/13 8:12 AM



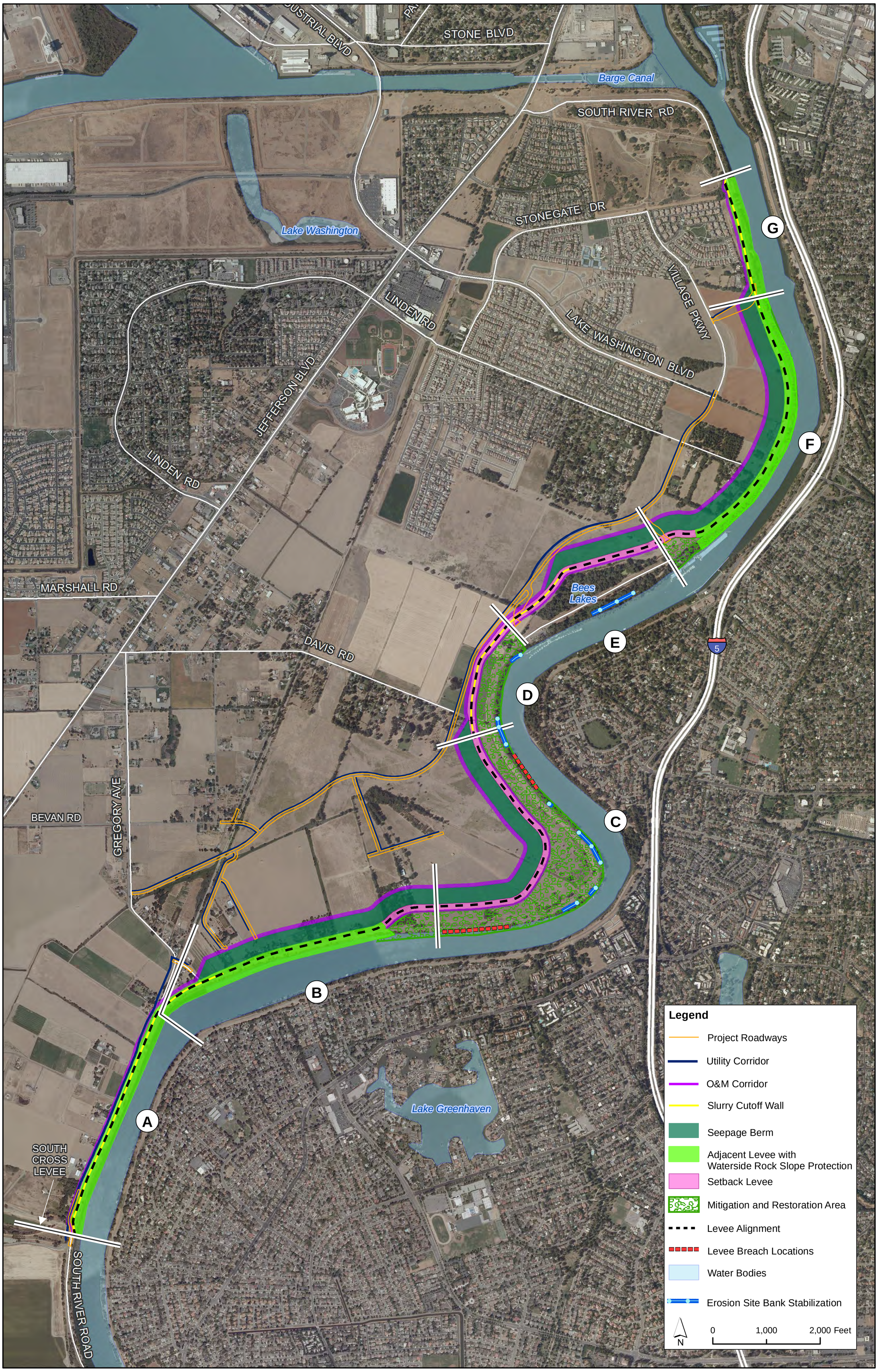
Southport Early Implementation Project Post-Construction Conditions - Alternative 2

Alternative 3.pdf 1 3/25/13 8:13 AM



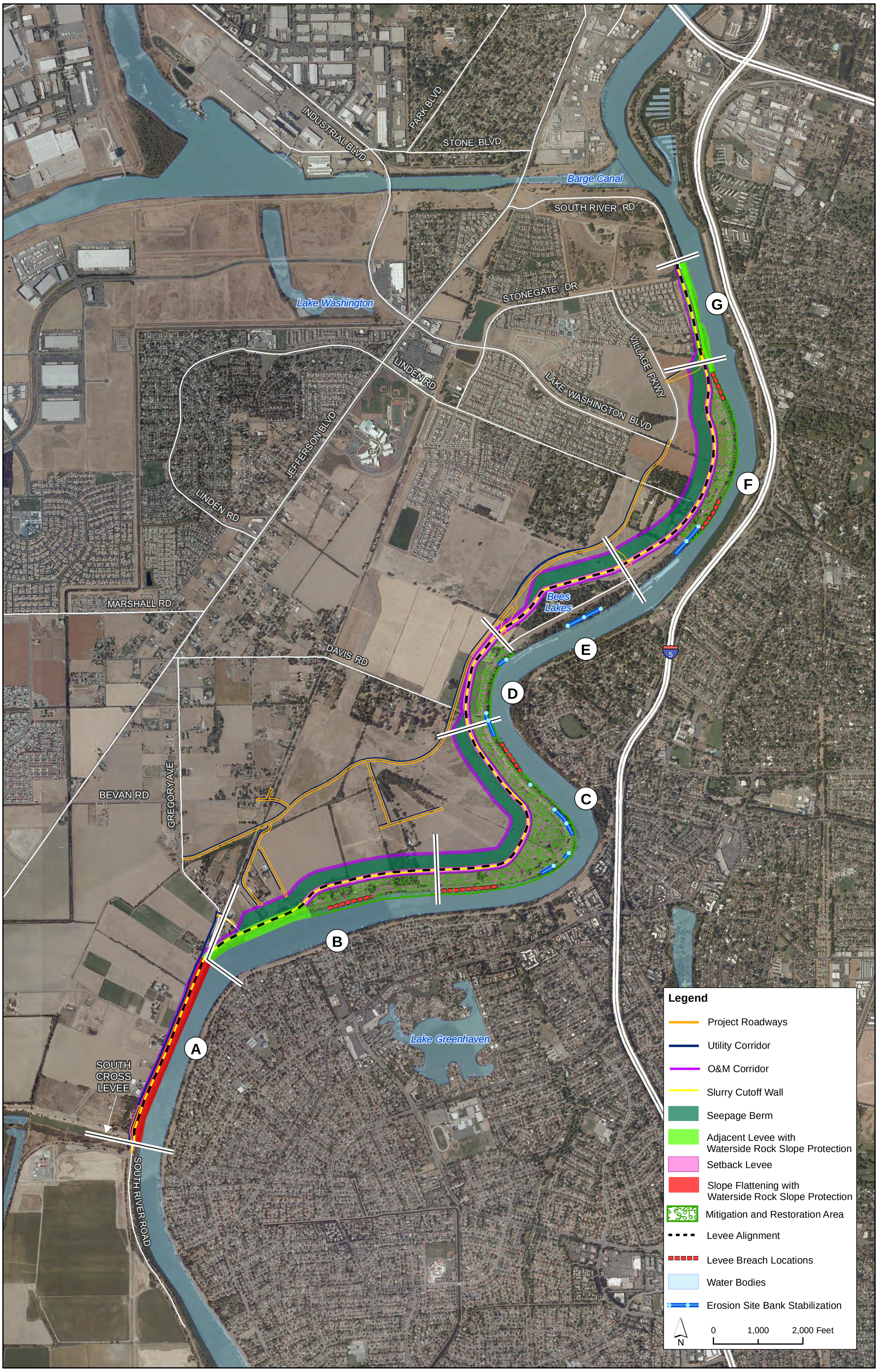
Southport Early Implementation Project Post-Construction Conditions - Alternative 3

Alternative 4.pdf 1 3/25/13 8:14 AM



Southport Early Implementation Project Post-Construction Conditions - Alternative 4

Alternative 5.pdf 1 3/25/13 8:15 AM



Southport Early Implementation Project Post-Construction Conditions - Alternative 5

Comments?

Thank you for your interest in this public safety project. Please provide us with your input on the content of the Environmental Impact Statement/ Environmental Impact Report here.

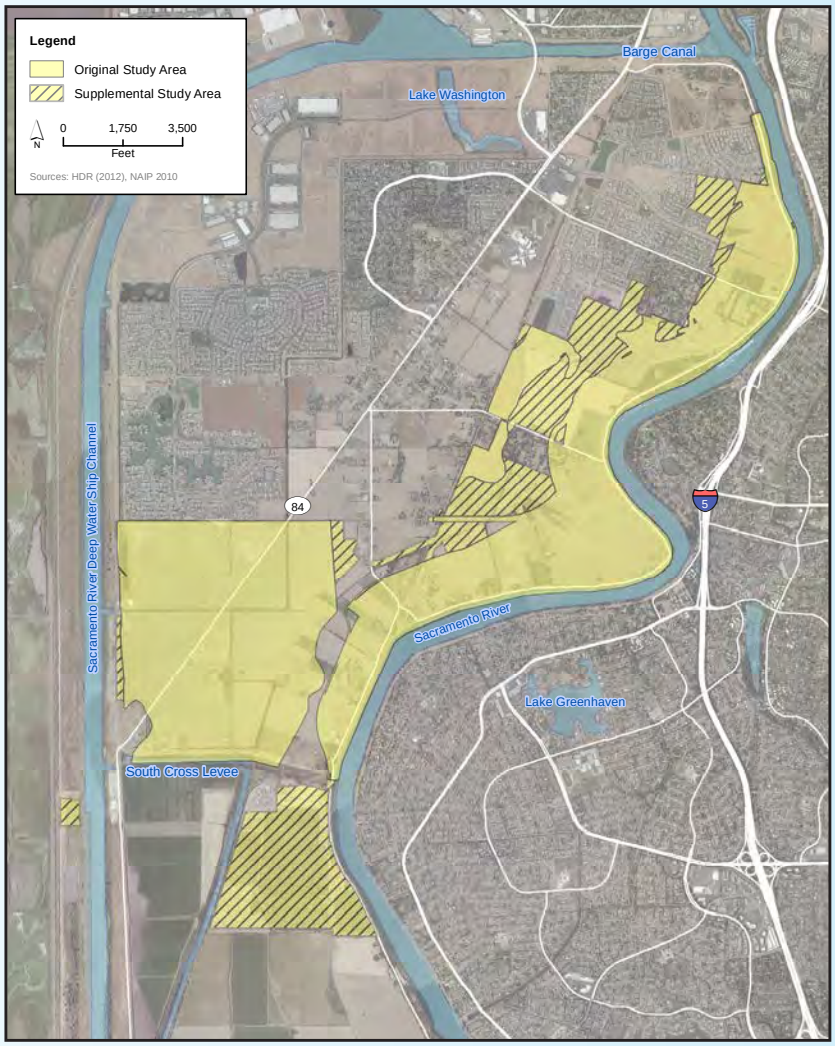
The Southport Sacramento River Early Implementation Project

Environmental Review Process Fact Sheet

About the Project

The West Sacramento Area Flood Control Agency (WSAFCA) is proposing the Southport Sacramento River Early Implementation Project (Southport EIP) to implement flood risk-reduction measures along approximately 6 miles of the Sacramento River South Levee. The Southport EIP is the fourth levee risk-management project (following the I-Street Bridge, CHP Academy, and The Rivers projects) under the West Sacramento Levee Improvement Program (WSLIP). The WSLIP is a city-wide comprehensive flood risk-management program initiated in 2007.

Construction of the Southport EIP would bring the levee up to current standard with Federal and state flood risk-reduction criteria, addressing the under- and through-seepage, erosion, and slope instability that hinder the levee's performance. The Southport EIP may also provide opportunities for ecosystem restoration and public recreation.



The Environmental Process

To comply with the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA), a joint environmental impact statement/environmental impact report (EIS/EIR) is being developed. The U.S. Army Corps of Engineers (USACE) is the Federal lead agency under NEPA, and WSAFCA is the lead agency under CEQA. While WSAFCA is proposing the Southport EIP, USACE approval is needed for alterations to Federal levees under Section 14 of the Rivers and Harbors Act; discharge of dredge or fill materials into jurisdictional waters of the United States under Section 404 of the Clean Water Act; and activities in navigable waters under Section 10 of the Rivers and Harbors Act.

The EIS/EIR will describe the proposed Southport EIP alternatives, including the Applicant Preferred Alternative, and analyze the potential impacts and mitigation measures associated with each alternative. Potential impacts on resources—including aesthetics, soils, flood management, wildlife, vegetation, noise, recreation, and traffic—will be evaluated in the EIS/EIR.

over

Establishing the Scope of the EIS/EIR

In summer 2011, WSAFCA and USACE issued a Notice of Preparation (NOP) and Notice of Intent (NOI), respectively, to prepare a joint EIS/EIR for the Southport EIP. A 30-day comment period was opened, and two scoping meetings were held. Since then, WSAFCA has expanded the Southport EIP study area to include additional soil borrow sites that may be needed to construct the Southport EIP and a modified roadway alignment. The expanded study area includes the area of flood risk-reduction measure construction; roadway construction and/or relocation; and potential soil borrow sites (see map). Because WSAFCA has increased the study area, a second 30-day comment period is now being held, from March 8, 2013, to April 8, 2013, to solicit additional comments on the Southport EIP that are inclusive of the additional borrow sites. After considering all comments received during both scoping periods, WSAFCA and USACE will complete and release the Draft EIS/EIR, available for public review in summer 2013.

EIP Alternatives

Five alternatives are being considered. The priority of each alternative is to reduce flood risk, but each also provides varying opportunities for ecosystem restoration and recreation. Each alternative is a combination of two or more of the following flood-risk reduction measures:

- Levee slope flattening
- Setback levee
- Adjacent levee
- Seepage berms on the land side of the levee
- Rock slope protection on the water side
- Slurry cut-off walls

EIP Status

The Southport EIP is currently in the environmental effects review and mitigation development phase. The environmental, design, and program management teams will work collaboratively to determine the feasibility of the alternatives, ensuring they provide a level of flood risk-reduction that meets current standards, is cost effective, and limits the short- and long-term adverse impacts to the environment. Construction is scheduled to begin in 2014.

For More Information

For more information about public input opportunities, the environmental process, and other flood-risk management projects in the city, visit *www.cityofwestsacramento.org/city/flood/southport_eip/*.

We Want Your Input

If you would like to comment on the content of the EIS/EIR, please submit comments to the individuals below. All comments must be received by 5 p.m. on April 8, 2013.

Megan Smith, Project Manager
ICF International
630 K Street, Suite 400
Sacramento, CA 95814
megan.smith@icfi.com

Tanis Toland
U.S. Army Corps of Engineers, Sacramento District
Delta Programs Integration & Ecosystem Restoration
1325 J Street, Sacramento, CA 95814
tanis.j.toland@usace.army.mil

US Army Corps of Engineers ®
Sacramento District

WSAFCA
West Sacramento Area Flood Control Agency

The Southport Sacramento River Early Implementation Project Supplemental Scoping

Comment Card

Name:_____ Date:_____

Telephone: _____Email:_____

Affiliation: _____Title (if applicable):_____

Street Address:_____

City:_____ State:_____ Zip:_____

Thank you for your interest in this flood risk-reduction effort. The West Sacramento Area Flood Control Agency and the U.S. Army Corps of Engineers value your input regarding this Early Implementation Project. Please provide us with your comments regarding the scope of the Environmental Impact Statement/ Environmental Impact Report being prepared for this project. Please write in the space below legibly.

For your convenience, you may take this self-addressed card home, fill it out, and fold it in half and mail it. You may also send comments via email to Megan Smith at *megan.smith@icfi.com* or Tanis Toland at *tanis.j.toland@usace.army.mil*. **All comments must be received or postmarked by April 8, 2013**.

- Megan Smith, ICF International, 630 K Street, Suite 400, Sacramento, CA 95814
- Tanis Toland, U.S. Army Corps of Engineers, Sacramento District, Delta Programs Integration & Ecosystem Restoration, 1325 J Street Sacramento, CA 95814

The Southport Sacramento River Early Implementation Project Supplemental Scoping

PLEASE FOLD ALONG THIS LINE FOR MAILING

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

PLACE
POSTAGE
HERE

West Sacramento Area Flood Control Agency
c/o Ms. Megan Smith
630 K Street, Suite 400
Sacramento, CA 95814

Attachment C

- Written comments received

CALIFORNIA STATE LANDS COMMISSION
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202

JENNIFER LUCCHESI, *Executive Officer*
(916) 574-1800 FAX (916) 574-1810
California Relay Service From TDD Phone **1-800-735-2929**
from Voice Phone **1-800-735-2922**

Contact Phone: **(916) 574-1890**
Contact FAX: **(916) 574-1885**

April 8, 2013

File Ref: SCH # 2011082069

Megan Smith
ICF International
630 K Street, Suite 400
Sacramento, CA 95814

Subject: Supplemental Notice of Preparation (SNOP) for an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Southport Sacramento River Early Implementation Project (EIP), Yolo County

Dear Ms. Smith:

The California State Lands Commission (CSLC) staff has reviewed the subject SNOP for an EIS/EIR for the Southport Sacramento River EIP (Project), which is being prepared by the West Sacramento Area Flood Control Agency (WSAFCA) and the U.S. Army Corps of Engineers (USACE). WSAFCA issued an NOP for the Project on August 26, 2011 (2011 NOP), but has since expanded the EIP study area to include additional potential soil borrow sites for the Project activities. WSAFCA, as a public agency proposing to carry out a project, is the lead agency under the California Environmental Quality Act (CEQA) (Pub. Resources Code § 21000 et seq.), and the USACE, as the primary federal permitting agency, is the lead agency under the National Environmental Policy Act (NEPA) (42 U.S.C. § 4321 et seq.). The CSLC will act as a trustee agency because of its trust responsibility for projects that could directly or indirectly affect sovereign lands, their accompanying Public Trust resources or uses, and the public easement in navigable waters. Additionally, if the Project involves work on sovereign lands, the CSLC will act as a responsible agency.

CSLC Jurisdiction and Public Trust Lands

The CSLC has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. The CSLC also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (Pub. Resources Code, §§ 6301, 6306). All tidelands and submerged lands, granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the Common Law Public Trust.

As general background, the State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable lakes and waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all people of the State for statewide Public Trust purposes, which include but are not limited to waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. On tidal waterways, the State's sovereign fee ownership extends landward to the mean high tide line, except for areas of fill or artificial accretion or where the boundary has been fixed by agreement or a court. On navigable non-tidal waterways, including lakes, the State holds fee ownership of the bed of the waterway landward to the ordinary low water mark and a Public Trust easement landward to the ordinary high water mark, except where the boundary has been fixed by agreement or a court. Such boundaries may not be readily apparent from present day site inspections.

Flood protection measures to be considered in the EIS/EIR appear to include the possibility of work waterward of the ordinary high water mark of the Sacramento River, which is State-owned sovereign land under the jurisdiction of the CSLC. A lease and formal authorization for the use of sovereign land will be required from the CSLC for any portion of the Project encroaching on State-owned lands. Please contact Ninette Lee at the contact information at the end of this letter for questions on leasing.

Project Description

As described in the SNOP, WSAFCA proposes to implement flood risk-reduction measures on the uplands and along the west bank of the Sacramento River in West Sacramento. The Project would meet WSAFCA's objectives as follows:

- Bring the levee up to standard with Federal and State flood protection criteria; and
- Provide opportunities for ecosystem restoration and public recreation.

CSLC staff understands that the Project could include some or all of the following components:

- Slope flattening of the existing levee;
- Use of seepage berms located to the land side of the levee,
- Rock slope protection located the water side of the levee;
- Setback levees and/or adjacent levees located landward of the existing levee;
- Relief wells; and
- Slurry cut-off wells.

Secondary activities that support these primary Project components could include:

- Use of neighboring roadways for Project ingress and egress;
- Creation of temporary access roads;
- Construction of new roadways, including elevated spans;
- Resurfacing and/or relocation of existing roadways;
- Removal of vegetation adjacent to the riverfront;
- Extraction of soil from identified borrow sites;

- Disposal of excess soil at identified disposal sites; and
- Relocation of public utilities.

Environmental Review

CSLC staff requests that the following potential impacts be analyzed in the EIS/EIR.

General Comments

1. Project Description: From the SNOP, it appears that the EIS/EIR will analyze a variety of flood control methods, some or all of which would be integrated into the Project's final design. A thorough and complete Project Description should be included in the EIS/EIR in order to facilitate meaningful environmental review of potential impacts, mitigation measures, and alternatives for all of the methods under consideration. The Project Description should be as precise as possible in describing the details of all allowable activities (e.g., types of equipment or methods that may be used, maximum area of impact or volume of sediment removed or disturbed, seasonal work windows, locations for material borrow or disposal, etc.), as well as the details of the timing and length of activities. Thorough descriptions will facilitate CSLC staff's determination of the extent and locations of its leasing jurisdiction, make for a more robust analysis of the work that may be performed, and minimize the need for subsequent environmental analysis.

2. Adequate Mitigation: To avoid the improper deferral of mitigation, mitigation measures should either be presented as specific, feasible, enforceable obligations, or should be presented as formulas containing "performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way" (State CEQA Guidelines § 15126.4, subd. (b)).[1]

Biological Resources

3. Vegetation Removal: Since the release of the 2011 NOP, "removal of vegetation adjacent to the riverfront" has been added as a potential secondary activity to support the Project's primary objectives (SNOP, p. 2). Please note that on August 14, 2012, the CSLC approved a resolution (staff report and resolution attached) in support of House of Representatives Bill (H.R.) 5831, reintroduced in January, 2013 as H.R. 399, which would "[direct] the Secretary of the Army to undertake a comprehensive review of the [USACE] policy guidelines on vegetation management for levees in order to determine whether current federal policy is appropriate for all regions of the United States" (Levee Revegetation Act). The resolution, which supports the bill's efforts to revisit the USACE's variance process to incorporate regional stakeholders and provide for regional variability, notes that the removal of already dwindling riparian vegetation in

[1] The State "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

California "has the potential to severely limit, if not extinguish, the public's ability to access, use and enjoy the State's public trust lands." (8/14/2012 Calendar Item #100.)

In consideration of the controversy surrounding implementation of the USACE's vegetation policy, "*Process for Requesting a Variance From Vegetation Standards for Levees and Floodwalls--75 Fed. Reg. 6364-68*" and the associated Engineer Technical Letter (ETL) 1110-2-571 "*Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures*" adopted April 10, 2009, including a lawsuit involving the California Department of Fish and Wildlife (CDFW),[2] CSLC staff requests that the EIS/EIR include the following:

- A summary of the USACE's current policy and variance process, as well as a discussion of critiques and suggestions of California state agencies and stakeholders, notably the California Department of Water Resources and CDFW;
- Analysis of the potential impacts on both riparian habitat and special status species that rely on or benefit from such habitat, such as Swainson's hawk, which is known to nest along the Sacramento River, and native salmonid species;
- Consideration and discussion of alternatives to the Project that would minimize or eliminate proposed vegetation removal (State CEQA Guidelines, § 15126.6); and
- Evaluation of the potential cumulatively considerable impacts of Project-related levee vegetation removal, in the context of potential, "reasonably foreseeable" flood system-wide implementation of the USACE's vegetation policy (State CEQA Guidelines, § 15130).

4. Sensitive Species: WSAFCA should conduct queries of the CDFW California Natural Diversity Database (CNDDB) and U.S. Fish and Wildlife Service's (USFWS) Special Status Species Database to identify any special-status plant or wildlife species that may occur in the Project area. Additionally, WSAFCA should consult early in the process with appropriate CDFW and USFWS staffs to identify species of concern. For example, the Sacramento River is known to provide habitat for delta smelt, Chinook Salmon, and steelhead, all of which are listed under the State and/or Federal Endangered Species Acts. These species could be impacted by loss of habitat or habitat complexity, increased siltation, increased scour and erosion, or stranding during installation or removal of cofferdams. The loss of natural, shaded streamside fish habitat that contains riffles, natural woody debris, and other complex features due to the placement of rip rap or other unnatural bank stabilization should be evaluated and minimization or mitigation measures developed. The State-listed Swainson's hawk, if present in the Project area, could be impacted by tree removal and construction-related

[2] See *Friends of the River, et al. v. United States Army Corps of Engineers, et al.*

disturbance. The EIS/EIR should analyze the potential for such species to occur in the Project area and, if impacts to special-status species are found to be significant, identify feasible mitigation measures, such as restricting work during certain time periods, establishing buffers, and restoring or compensating for lost habitat.

5. Invasive and Non-native Species: One of the major stressors in Sacramento-San Joaquin Delta system (Delta) is introduced species. Therefore, the EIS/EIR should consider the Project's potential to encourage the establishment or proliferation of aquatic invasive species (AIS) such as the quagga mussel, or other nonindigenous, invasive species including aquatic and terrestrial plants. For example, construction boats and barges brought in from long stays at distant projects may transport new species to the Project area via hull biofouling, wherein marine and aquatic organism attach to and accumulate on the hull and other submerged parts of a vessel. If the analysis in the EIS/EIR finds potentially significant AIS impacts, possible mitigation could include contracting vessels and barges from nearby, or requiring a certain degree of hull-cleaning from contractors. The CDFW's Invasive Species Program could assist with this analysis as well as with the development of appropriate mitigation (information at http://www.dfg.ca.gov/invasives/).

   In addition, in light of the recent decline of native pelagic organisms and in order to protect at-risk fish species, the EIS/EIR should examine if any elements of the Project (e.g., changes in bankside vegetative cover) would favor non-native fisheries within the Delta.

6. Construction Noise: The EIS/EIR should also evaluate noise and vibration impacts on fish and birds from construction, restoration or flood control activities in the water, on the levees, and for land-side supporting structures. Mitigation measures could include species-specific work windows as defined by CDFW, USFWS, and the National Oceanic and Atmospheric Administration's Fisheries Service (NOAA Fisheries). Again, staff recommends early consultation with these agencies to minimize the impacts of the Project on sensitive species.

Climate Change

7. Greenhouse Gases: A greenhouse gas (GHG) emissions analysis consistent with the California Global Warming Solutions Act (AB 32) and required by section 15064.4 of the State CEQA Guidelines should be included in the EIS/EIR. This analysis should identify a threshold for significance for GHG emissions, calculate the level of GHGs estimated to result from construction and ultimate build-out of the Project, as well as any loss of carbon dioxide sequestration potential from removed riparian vegetation, determine the significance of the impacts of those emissions, and, if impacts are significant, identify mitigation measures that would reduce or minimize them. The analysis should pay particular attention to the possibility of cumulative impacts of GHG emissions.

Cultural Resources

8. Submerged Resources: The EIS/EIR should evaluate the possibility of submerged cultural resources in the Project area. The CSLC maintains a shipwrecks database, available at http://shipwrecks.slc.ca.gov, that can assist with this analysis. The database includes known and potential vessels located on the State's tide and submerged lands; however, the locations of many shipwrecks remain unknown. Please note that any submerged archaeological site or submerged historic resource that has remained in state waters for more than 50 years is presumed to be significant.

9. Title to Resources: The EIS/EIR should mention that the title to all abandoned shipwrecks, archaeological sites, and historic or cultural resources on or in the tide and submerged lands of California is vested in the State and under the jurisdiction of the CSLC. Mitigation measures should be developed to address any submerged cultural resources that may be affected by the proposed Project and any unanticipated discoveries during the Project's construction. CSLC staff requests that WSAFCA and/or USACE consult with CSLC staff, should any cultural resources be discovered during construction of the proposed Project.

Hydrology and Water Quality

10. Dredging and Construction Disturbance: The EIS/EIR should disclose and analyze the Project's potential to adversely affect water quality. Such impacts are likely to include increased turbidity and sedimentation from dredging, fill, and other in-water construction work, and potential pollution from worksite spills or mobilization of pollutants from the dredged soils. For any effects found to be potentially significant, the EIS/EIR should identify feasible mitigation measures, such as use of turbidity curtains, which would avoid or lessen such effects.

Recreation

11. Public Access: As public access and recreation on State lands are key concerns of the Public Trust, CSLC staff requests that the EIS/EIR analyze the Project's short-term and long-term impacts on recreation resources, both during construction and for the life of the Project. Although the State CEQA Guidelines Appendix G Checklist only explicitly addresses impacts related to increased use of existing parks or construction of new parks or recreational facilities, CSLC staff requests that the EIS/EIR also consider the effects that the Project and its construction may have on the public's ability to access, enjoy, and recreate in and along the Sacramento River. Any significant impacts will require mitigation measures that either minimize or reduce the impacts or otherwise compensate visitors; measures could include post-construction restoration and/or revegetation of recreation and access areas, installation of temporary or permanent alternate river access points, creation of clearly marked detours, etc.

Thank you for the opportunity to comment on the SNOP for the Project. As a trustee and potentially responsible agency, the CSLC will need to rely on the Final EIS/EIR for the issuance of any new lease as specified above and, therefore, we request that you consider our comments during preparation of the EIS/EIR. Please send additional information on the Project to the CSLC staff listed below as plans become finalized.

Please send copies of future Project-related documents or refer questions concerning environmental review to Sarah Sugar, Environmental Scientist, at (916) 574-2274 or via e-mail at Sarah.Sugar@slc.ca.gov. For questions concerning archaeological or historic resources under CSLC jurisdiction, please contact Senior Staff Counsel Pam Griggs at (916) 574-1854 or via email at Pamela.Griggs@slc.ca.gov. For questions concerning CSLC leasing jurisdiction, please contact Ninette Lee, Public Land Manager, at (916) 574-1869, or via email at Ninette.Lee@slc.ca.gov.

Sincerely,

Cy R. Oggins, Chief
Division of Environmental Planning
and Management

References

Levee Vegetation Review Act of 2013, H. 399, 113th Cong., 1st Sess. (2013).

Attachments

8/14/2012, Calendar Item #100
8/14/2012, Calendar Item #100, Exhibit A

cc: Office of Planning and Research
Ninette Lee, LMD, CSLC
Sarah Sugar, DEPM, CSLC
Pam Griggs, DEPM, CSLC
Eric Milstein, DEPM, CSLC

CALENDAR ITEM
C100

A Federal 08/14/12

S Federal S. Pemberton

CONSIDER SUPPORTING FEDERAL LEGISLATION THAT WOULD ENACT THE LEVEE VEGETATION REVIEW ACT OF 2012, WHICH WOULD REQUIRE THE UNITED STATES ARMY CORPS OF ENGINEERS TO ADOPT A REGIONAL VARIANCE POLICY FOR VEGETATION ON LEVEES

INTRODUCTION:

State Lands Commission staff has been reviewing various legislative proposals introduced in the 112th Congress that involve lands under the Commission's jurisdiction. This report describes the proposed Levee Vegetation Review Act of 2012 (House Bill 5831 – Matsui) and proposes a Resolution for the Commission to consider adopting in support of this bill.

LEGISLATIVE PROPOSAL:

House Bill 5831 (Matsui): The Levee Vegetation Review Act of 2012

SUMMARY AND BILL DESCRIPTION:

House Bill 5831 would require the United States Army Corps of Engineers (Corps) to adopt a regional variance policy for vegetation on levees, instead of the Corps' uniform national policy. The bill would require the Secretary of the Army, in consultation with interested federal agencies, state and local governments, tribes, nongovernmental organizations and the public, to undertake a comprehensive review of the Corps' policy guidelines on vegetation management for levees. In conducting the review, the Secretary would be required to study the guidelines in view of: 1) the varied interests and responsibilities in managing flood risks, including the need to provide the greatest levee safety benefit with limited resources; 2) preserving, protecting, and enhancing natural resources, including the potential benefit that vegetation on levees can have in providing habitat for species of concern; 3) protecting the rights of Native Americans pursuant to treaties and statutes; and, 4) any other factors the Secretary considers appropriate.

In conducting the review, the Secretary would also be required to consider factors that promote and allow for variances from the national guidelines on a regional or watershed basis, including soil conditions, hydrologic factors, levee performance history, vegetation patterns and characteristics, and environmental resources. Corps Regional Integration Teams would be required to recommend to the Chief of Engineers vegetation management policies for levees that are consistent with state and federal laws.

As part of the review, the Secretary would be required to solicit and consider the views of the National Academy of Engineering, which must be made publicly available and included in supporting materials issued in connection with the revised guidelines authorized by this bill.

The Secretary would be authorized to revise the Corps' levee management guidelines two years after the date of enactment of this bill, consistent with the results of the review. The revised guidelines would be required to provide a practical process for approving regional or watershed variances from the national guidelines, reflecting consideration of measures to maximize public safety, regional climatic variations, environmental quality, implementation challenges, and allocation of responsibilities.

BACKGROUND:

California's Central Valley Flood Control System includes approximately 1,600 miles of levees, with trees, brush and other woody vegetation growing on most of them. Ever since the system was turned over the State to operate, vegetation has been encouraged, protected, or introduced by the Corps on many levees.

In the aftermath of Hurricane Katrina, the Corps undertook a review of their levee standards to improve public safety. As part of that process, they adopted a new vegetation management policy requiring the removal of all woody vegetation over 2 inches in diameter from levees throughout the nation; unless a special variance is approved. This policy was adopted even though an Interagency Performance Task Force Report concluded that the flooding in New Orleans from Hurricane Katrina was caused by engineering and construction failures of the levees. Woody vegetation was not cited as a cause of levee failure.

In April 2010, the California Department of Water Resources (DWR) and the California Department of Fish and Game (DFG) submitted comments on the process for requesting a variance from the Corps' vegetation standards for levees. The Departments noted that proposed requirements for a variance are so stringent and ambiguous that variances are unlikely to be issued. Further, their comments expressed the importance of coordinating public safety improvements with protection of the unique and irreplaceable fisheries and wildlife habitats associated with the Central Valley Flood Protection System. They further expressed their view that the Corps' policy will reduce public safety in California, result in extensive and unnecessary environmental and

ecosystem destruction, and remove the Corps' responsibility to assist state and local levee maintenance agencies in ensuring the integrity of California's levee system.

Accordingly, DWR and DFG have requested that the Corps cease implementation of its new policy and instead collaborate with California representatives and interested stakeholders to develop and adopt a practical regional variance process consistent with the 2009 Central Valley Flood System Improvement Framework, with the following features:

- Provide a regional approach that addresses the unique setting and history of the Sacramento, San Joaquin, and Delta levee systems.
- Provide the opportunity to allow well-managed, woody vegetation on all levee slopes, as determined by the variance, and not foreclose vegetation options on all but the lower 1/3 waterside of levees.
- Provide clear guidance on the level of detail needed for a variance, how that detail will be evaluated, and an appeal procedure should the Corps and the local sponsor disagree on the outcome of the process.
- Initiate consultation under the Endangered Species Act and complete a National Environmental Policy Act analysis.

House Bill 5831 is consistent with DWR and DFG's approach and proposed solution. It also addresses concerns voiced by a wide range of stakeholders concerning application of the Corps' policy in California, including it having the unintended consequence of actually increasing flood risks and that it would be devastating to the salmon, steelhead and other species in the Central Valley listed under the State and Federal Endangered Species Acts.

OTHER PERTINENT INFORMATION:

Many of the federal levees in California that are subject to the Corps' levee maintenance policy are either on or adjacent to public trust lands under the jurisdiction of the Commission. According to DWR and DFG, the implementation of the Corps' vegetation removal policy will require the removal of dwindling riparian habitat, which will likely have a devastating effect on the species that depend on this unique habitat, including endangered species such as the Chinook salmon, Central Valley steelhead, Western yellow-billed cuckoo and the Swainson hawk – all public trust resources under the Commission's jurisdiction. The removal of vegetation also has the potential to severely limit, if not extinguish, the public's ability to access, use and enjoy the State's public trust lands.

House Bill 5831 is a bipartisan bill, cosponsored by 30 members of the California congressional delegation. It was introduced on May 11, 2012 and referred to the House Transportation and Infrastructure Committee. To date, no hearings have been set.

RECOMMENDED ACTION:
IT IS RECOMMENDED THAT THE COMMISSION:

1. Adopt the Resolution in support of House Bill 5831 attached hereto as Exhibit A.

EXHIBIT A

RESOLUTION BY THE CALIFORNIA STATE LANDS COMMISSION SUPPORTING H.R. 5831, THE 'LEVEE VEGETATION REVIEW ACT OF 2012,' WHICH WOULD DIRECT THE SECRETARY OF THE ARMY TO UNDERTAKE A COMPREHENSIVE REVIEW OF THE U.S. ARMY CORPS OF ENGINEERS' POLICY GUIDELINES ON VEGETATION MANAGEMENT FOR LEVEES

WHEREAS, the California State Lands Commission serves the people of California by providing stewardship of the lands, waterways, and resources entrusted to its care through economic development, protection, preservation, and restoration; and,

WHEREAS, pursuant to the Public Trust Doctrine, tide and submerged lands, including lands underlying non-tidal navigable waterways are owned by the states and are held in trust for the benefit of the public, and these public trust lands are to be used to promote the public's interest in water dependent or water oriented activities including, but not limited to, water related commerce, navigation, fisheries, environmental preservation and water related recreation; and,

WHEREAS, the Public Trust Doctrine and California's Constitution establish the right of the public to access and use public trust lands, as well as establish the public's right to fish on public trust lands; and,

WHEREAS, through its management of public trust lands, the Commission has the duty to protect these lands and the living resources therein for the purposes of preserving and continuously assuring the public's ability to access, use, and enjoy public trust lands and the resources inhabiting these lands and waters; and,

WHEREAS, California's Central Valley Flood Control System includes approximately 1,600 miles of levees, many of which are located on or adjacent to state sovereign lands, with trees, brush and other woody vegetation growing on most of them; and,

WHEREAS, ever since the Central Valley Floor Control System was turned over the State to operate, vegetation has been encouraged, protected, or introduced by the U.S. Army Corps of Engineers on many levees, much of which was intended to preserve habitat while improving levee stability; and,

WHEREAS, in the aftermath of Hurricane Katrina, the U.S. Army Corps of Engineers undertook a review of their levee standards to improve public safety, and as part of that process, they adopted a new vegetation management policy requiring the removal of all woody vegetation over 2 inches in diameter from levees throughout the nation; unless a special variance is approved; and,

WHEREAS, over the past several years, the California Department of Fish and Game and the California Department of Water Resources, along with other interested parties, have had many discussions and exchanged many letters with the U.S. Army Corps of Engineers requesting that the Corps reconsider their vegetation removal policy and engage in a cooperative effort to address levee reliability issues; and,

WHEREAS, H.R. 5831, which is a bipartisan effort, would direct the Secretary of the Army to undertake a comprehensive review, in consultation with federal agencies, state and local governments, tribes, nongovernmental organizations and the public, of the U.S. Army Corps of Engineers' policy guidelines on vegetation management for levees; and,

WHEREAS, H.R. 5831 would require the U.S. Army Corps of Engineers to examine its vegetation policy and its impact on public safety, regional climatic variations, environmental quality, implementation challenges, use the best available science, and adapt levee policy towards the needs of local communities; and,

WHEREAS, H.R. 5831 would authorize the Secretary of the Army to revise the U.S. Army Corps of Engineers' levee management guidelines, consistent with the results of its comprehensive review, and the revised guidelines would be required to provide a practical process for approving regional or watershed variances from the Corps' guidelines, reflecting consideration of measures to maximize public safety, regional climatic variations, environmental quality, implementation challenges, and allocation of responsibilities; and,

WHEREAS, the Commission believes that the enactment of H.R. 5831 would considerably protect and enhance the public trust lands either on or adjacent to the federal levees in California that are subject to the U.S. Army Corps of Engineers' levee maintenance policy; now, therefore, be it

RESOLVED BY THE CALIFORNIA STATE LANDS COMMISSION that it supports H.R. 5831 (Matsui), the 'Levee Vegetation Review Act of 2012', that would require the Secretary of the Army to undertake a comprehensive review of the U.S. Army Corps of Engineers' policy guidelines on vegetation management for levees and would require the U.S. Army Corps of Engineers to move to regional variances with input from the state and local entities that are most familiar with the unique challenges facing each area; and be it further

RESOLVED, that the Commission's Executive Officer transmit copies of this resolution to the President and Vice President of the United States, to the Governor of California, to the Majority and Minority Leaders of the United States Senate, to the Speaker and Minority Leader of the United States House of Representatives, and to each Senator and Representative from California in the Congress of the United States.

County of Yolo

PLANNING AND PUBLIC WORKS DEPARTMENT

John Bencomo
DIRECTOR

292 West Beamer Street
Woodland, CA 95695-2598
(530) 666-8775 FAX (530) 666-8156
www.yolocounty.org

April 8, 2013

Megan Smith, Project Manager
ICF International
630 K Street, Suite 400
Sacramento, CA 95814

Re: Supplemental Notice of Preparation of an Environmental Impact Statement/Environmental Impact Report for the <u>Southport Sacramento River Early Implementation Project</u>

Dear Ms. Smith,

The purpose of this letter is to provide comments in *response to the above referenced Supplemental Notice of Preparation for the Southport Sacramento* River Early Implementation Project (EIP). The project consists of implementing flood risk-reduction measures along the Sacramento River South Levee in the City of West Sacramento. On August 26, 2011, the West Sacramento Area Flood Control Agency (WSAFCA) issued a Notice of Preparation for the EIP and undertook a 30-day public comment period. Since that time, WSAFCA has expanded the EIP study area to include additional borrow sites that may be employed to provide borrow material needed to construct the EIP, including two sites located immediately south of the City of West Sacramento in unincorporated Yolo County. The County has reviewed the Notice of Preparation and offers the following comments:

<u>Agricultural Mining Permit</u>
Pursuant to the County's Agricultural Surface Mining and Reclamation Ordinance (Title 10, Chapter 8 of the Yolo County Code), the mining of agricultural soils (in unincorporated Yolo County) for use in the improvement of flood control facilities would require an Agricultural Surface Mining Permit from the County, which is a discretionary action. This permit should be included on the list of Permits and Approvals Required in the EIS/EIR.

<u>Reasonable Foreseeable Projects</u>
The County has been contacted about a potential project involving mining of soil on the same parcel included as one of the potential borrow sites for the EIP (the larger of the two parcels located in the unincorporated county—located immediately south of the City of West Sacramento and adjacent to the Sacramento Regional County Sanitation District (SRCSD) South River Pump Station). This site was listed as a possible borrow site in the SRCSD Flood Protection Project EIR, which was certified by the SRCSD Board in September 2012. Although the County has not yet received an application for an Agricultural Surface Mining Permit for this site, it is reasonably foreseeable that this project may move forward, which could limit the amount of soil available for the EIP project, and should therefore be included in your analysis.

Biological Resource Impacts

The excavation and removal of agricultural soils on the unincorporated borrow site parcel may result in the elimination of existing biological resources, including Swainson's hawk foraging habitat and riparian habitat. The biological resources analysis in the EIS/EIR should include detailed discussion on this issue and incorporate mitigation measures as appropriate. If it is determined that the removal of agricultural land will result in the loss of Swainson's hawk habitat, the applicant may be required to mitigate for such loss in accordance with the provisions in the Yolo Natural Heritage Program (YNHP) joint powers agreement.

Reclamation Unincorporated Borrow Site Parcel

The permanent removal of agricultural land is a significant issue that has local and regional consequences. The County's Agricultural Conservation Easement Program requires 1:1 mitigation for permanent conversion or removal of agricultural land. The EIS/EIR should identify the intended reclaimed use of unincorporated borrow site parcel and include mitigation measures as appropriate.

Impacts to County Roads

The EIS/EIR should thoroughly analyze truck haul route(s) and incorporate mitigation if significant impacts to County roads are determined. Depending on the haul route(s) selected, the County may require WSAFCA to apply for transportation permits for project related hauling on County roads. Additionally, encroachment permits will also be required for any work within the County right-of-way, including South River Road.

Greenhouse Gas Emissions

Although the unincorporated borrow site parcel is located within a reasonable distance to the project site, it is expected that truck trips will generate a substantial amount of greenhouse gas emissions. It is suggested that the EIS/EIR include a discussion of greenhouse gas emissions generated by the project and the effect they will have, if any, on global climate change. Appropriate mitigation measures to reduce greenhouse gas emissions due to truck hauling should be addressed in the EIS/EIR.

Flood Hazard Development Permit

The proposed borrow sites located in unincorporated Yolo County are within Flood Zone A and Flood Zone AE as designated on the Federal Emergency Management Agency's Flood Zone Map (Nos. 06113C0640G, 06113C0645G, 06113C0730G, and 06113C0735G) for Yolo County, dated June 18, 2010, and have been identified as areas subject to inundation by the 1-percent-annual-chance flood event. The County Floodplain Administrator is responsible for enforcing the Flood Damage Prevention Ordinance (Title 8, Chapter 3 of the Yolo County Code), which implements the State Model Flood Ordinance. This program regulates all projects located within a floodplain, regardless of whether the County is a lead agency, to ensure they are in compliance with the National Flood Insurance Program. In order to ensure that the borrow activities and the implementation of EIP will not adversely divert flood water or increase flooding on nearby properties and the surrounding area, WSAFCA is required to submit an application for a Flood Hazard Development Permit with the County well in advance of construction. As such, the Flood Hazard Development Permit should be included on the list of Permits and Approvals Required in the EIS/EIR.

The County appreciates the opportunity to comment on this Supplemental Notice of Preparation. If you have any questions about the items addressed in this letter, please contact Jeff Anderson, Associate Planner, by e-mail at jeff.anderson@yolocounty.org or by phone at (530) 666-8036.

Sincerely,

David Morrison, Assistant Director
Yolo County Planning and Public Works Department

State of California – The Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Bay Delta Region
7329 Silverado Trail
Napa, CA 94558
(707) 944-5500
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

April 8, 2013

Ms. Megan Smith, Project Manager
ICF International
630 K Street, Suite 400
Sacramento, CA 95814

Dear Ms. Smith:

Subject: Southport Sacramento River Early Implementation Project, Supplemental Notice of Preparation of an Environmental Impact Report/Environmental Impact Statement, SCH #2011082069, City of West Sacramento, Yolo County

The California Department of Fish and Wildlife (CDFW) has reviewed the Supplemental Notice of Preparation (NOP) of an Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Southport Sacramento River Early Implementation Project (EIP). CDFW is providing comments on the Supplemental NOP as a Trustee Agency and Responsible Agency. As Trustee for the State's fish and wildlife resources, CDFW has jurisdiction over the conservation, protection and management of the fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of such species for the benefit and use by the people of California. CDFW is also considered a Responsible Agency if a project would require a discretionary approval, such as a California Endangered Species Act (CESA) Permit or a Lake and Streambed Alteration Agreement (LSAA).

The West Sacramento Area Flood Control Agency (WSAFCA) is proposing the Southport Sacramento River EIP to implement flood risk-reduction measures along the Sacramento River South Levee in the City of West Sacramento, Yolo County. The project would bring the levee up to standard with federal and state flood protection criteria and provide opportunity for ecosystem restoration and public recreation. The supplemental NOP provides an expanded EIP study area to include additional soil borrow sites that may be used to provide borrow material for construction of the EIP.

General Comments

Please provide a complete assessment in the EIR/EIS (including but not limited to type, quantity and locations) of the habitats, flora and fauna within and adjacent to the project area, including endangered, threatened, and locally unique species and sensitive habitats. The assessment should include the reasonably foreseeable direct and indirect changes (temporary and permanent) that may occur with implementation of the project, including impacts downstream of the project. Rare, threatened and endangered species to be addressed should include all those which meet the California Environmental Quality Act (CEQA) definition (see CEQA Guidelines, Section 15380).

Lake and Streambed Alteration Agreement

CDFW may require an LSAA, pursuant to Fish and Game Code Section 1600 et seq., with the District for the proposed project-related activities within or near the Sacramento River. An LSAA is required for any activity that will divert or obstruct the natural flow, change the bed, channel, or bank including associated riparian or wetland/marsh resources, use material from the stream/channel bed, or substantially adversely affect fish and wildlife resources. Issuance of an LSAA is subject to CEQA. CDFW, as a Responsible Agency under CEQA, will consider the CEQA document for the project. Therefore, the CEQA document must specify impacts, mitigation measures, and include a mitigation monitoring and reporting program.

California Endangered Species Act

Please be advised that a CESA Permit must be obtained if the project has the potential to result in take of species of plants or animals listed under CESA, either during construction or over the life of the project. Issuance of a CESA Permit is subject to CEQA documentation. If the project will or has the potential to impact CESA listed species, early consultation is encouraged, as significant modification to the project and mitigation measures may be required in order to obtain a CESA Permit.

If you have any questions, please contact Ms. Crystal Spurr, Senior Environmental Scientist, at (209) 948-3777; or Mr. Jim Starr, Environmental Program Manager, at (209) 941-1944.

Sincerely,

Scott Wilson
Acting Regional Manager
Bay Delta Region

cc: State Clearinghouse

Sent: Friday, March 08, 2013 01:29 PM
To: dharzoff@sbcglobal.net <dharzoff@sbcglobal.net>
Cc: Tanis.J.Toland@usace.army.mil <Tanis.J.Toland@usace.army.mil>
Subject: Re: Scoping for EIS/EIP for Southport Early Implementation Project

Dear Mr. Harzoff,

Your scoping comment has been received and will be reviewed and considered by the lead agencies. Thank you for your interest in the Southport Sacramento River Levee project.

Sincerely,
Megan Smith
Sr. Project Manager

From: David Harzoff [mailto:dharzoff@sbcglobal.net]
Sent: Friday, March 08, 2013 12:55 PM
To: Smith, Megan
Cc: tanis.j.toland@usace.army.mil <tanis.j.toland@usace.army.mil>
Subject: Scoping for EIS/EIP for Southport Early Implementation Project

Hello:

Please consider the potential environmental impacts of public access along the rebuilt levees constructed in the Southport area. As a resident of West Sacramento I am among many who would like the opportunity for public access maximized. That includes pedestrian, bicycles, equestrians and some parking for vehicles.

Thank you,

Dave Harzoff
AICP, MBA, EDFP

DH Consulting
Planning | Redevelopment | Economic Development
Serving the Public and Private Sectors

916-371-0444 work
916-764-8646 cell
dharzoff@sbcglobal.net

DELTA PROTECTION COMMISSION
2101 Stone Blvd., Suite 210
West Sacramento, CA 95691
Phone (916) 375-4800 / FAX (916) 376-3962
Home Page: www.delta.ca.gov

Contra Costa County Board of Supervisors

Sacramento County Board of Supervisors

San Joaquin County Board of Supervisors

Solano County Board of Supervisors

Yolo County Board of Supervisors

Cities of Contra Costa and Solano Counties

Cities of Sacramento and Yolo Counties

Cities of San Joaquin County

Central Delta Reclamation Districts

North Delta Reclamation Districts

South Delta Reclamation Districts

Business, Transportation and Housing

Department of Food and Agriculture

Natural Resources Agency

State Lands Commission

April 8, 2013

John Powderly
I/C of West Sacramento Area Flood Control Agency
1110 West Capitol Avenue, 2nd Floor
West Sacramento, CA 95691

Subject: Southport Sacramento River Early Implementation Project
(SCH # 2011082069)

Dear Mr. Powderly:

Delta Protection Commission (Commission) staff have reviewed the Notice of Preparation (NOP) for the Southport Sacramento River Early Implementation Project Draft Environmental Impact Report and are providing these advisory comments. Although the project lies outside of the Primary Zone of the Delta, it still has the capability to affect resources of the Delta's Primary Zone environment.

Commission staff had provided a comment letter on this NOP in August 2011 (attached) and these comments remain relevant. Since the NOP was released in 2011, the study area has expanded to include additional soil borrow sites that may be employed to provide borrow material needed to construct the project. If this project will have any negative impacts on the Delta's agricultural, environmental, or recreational resources, than the possible impacts and proposed mitigation measures should be identified in the EIR.

Additionally, in 2012, Commission staff began the blueprint planning process for the Great California Delta Trail in Sacramento, San Joaquin and Yolo Counties. This process is pursuant to SB 1556 (Torlakson), which directed the Commission to develop and adopt a plan for a regional recreational corridor, which will extend throughout the five Delta Counties, and link to the San Francisco Bay Trail and Sacramento River Trails. The NOP mentions opportunities for providing public recreation. Coordination with the Commission's Delta Trail planning process would be useful in order to potentially link this project's recreation site(s) to a regional trail system, thus potentially increasing visibility and usage of the site(s).

Thank you for this opportunity to provide input. Please contact the Commission office at (916) 375-4800 if you have any questions.

Sincerely,

Michael Machado
Executive Director

att.: August 2011 Comment Letter

Atch

STATE OF CALIFORNIA – NATURAL RESOURCES AGENCY EDMUND G. BROWN, JR., *Governor*

DELTA PROTECTION COMMISSION
14215 RIVER ROAD
P.O. BOX 530
WALNUT GROVE, CA 95690
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Home Page: www.delta.ca.gov

COPY

Contra Costa County Board of Supervisors

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San Joaquin County Board of Supervisors

Solano County Board of Supervisors

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Cities of San Joaquin County

Cities of Contra Costa and Solano Counties

Cities of Sacramento and Yolo Counties

Central Delta Reclamation Districts

North Delta Reclamation Districts

South Delta Reclamation Districts

Business, Transportation and Housing

Department of Food and Agriculture

Natural Resources Agency

State Lands Commission

August 22, 2011

Megan Smith, ICF International
I/C of West Sacramento Area Flood Control Agency
630 K Street, Suite 400
Sacramento, CA 95814

Subject: Southport Sacramento River Early Implementation Project
(SCH#: 2011082069)

Dear Ms. Smith:

The staff of the Delta Protection Commission (Commission) has reviewed the Notice of Preparation (NOP) for the Southport Sacramento River Early Implementation Project draft Environmental Impact Report (EIR) and are providing these advisory comments. Although the project lies outside of the Primary Zone of the Delta, it still has the capability to affect resources of the Delta's Primary Zone environment.

The implementation of flood risk-reduction measures is consistent with the Commission's Land Use and Resource Management Plan for the Primary Zone of the Delta (Management Plan); which includes a goal of supporting the improvement, emergency repair, and long-term maintenance of Delta levees and channels. The Management Plan also includes a policy to support programs to make cost-effective levee investments in order to preserve the economy and character of the Delta.

The NOP also mentions that ecosystem restoration and public recreation opportunities would occur through this project. Ecosystem restoration and public recreation projects are generally consistent with goals and policies of the Management Plan, as long as the projects remain compatible with Delta agricultural practices. If the project will have any possible impact on Delta agricultural, these possible impacts and any proposed mitigation measures should be identified in the EIR.

Thank you for the opportunity to provide input. Commission staff looks forward to reviewing the full EIR/EIS. Please contact the Commission office at (916) 776-2290 if you have any questions about the comments provided.

Sincerely,

Michael Machado
Executive Director

cc: State Clearinghouse in the Office of Planning and Research

FEMA

U.S. Department of Homeland Security
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA. 94607-4052

FEMA

March 18, 2013

Megan Smith, Project Manager
ICF International
630 K Street, Suite 400
Sacramento, California 95814

Dear Ms. Smith:

This is in response to your request for comments on Notice of Preparation, Supplemental Notice of Preparation Environmental Impact Statement/Environmental Impact Report for Southport Sacramento River Early Implementation Project in West Sacramento, Yolo County, California.

Please review the current effective countywide Flood Insurance Rate Maps (FIRMs) for the County of Yolo (Community Number 060423), Maps revised May 16, 2012; and City of West Sacramento (Community Number 060728), Maps dated January 19, 1995. Please note that the City of West Sacramento, Yolo County, California is a participant in the National Flood Insurance Program (NFIP). The minimum, basic NFIP floodplain management building requirements are described in Vol. 44 Code of Federal Regulations (44 CFR), Sections 59 through 65.

A summary of these NFIP floodplain management building requirements are as follows:

- All buildings constructed within a riverine floodplain, (i.e., Flood Zones A, AO, AH, AE, and A1 through A30 as delineated on the FIRM), must be elevated so that the lowest floor is at or above the Base Flood Elevation level in accordance with the effective Flood Insurance Rate Map.

- If the area of construction is located within a Regulatory Floodway as delineated on the FIRM, any ***development*** must not increase base flood elevation levels. **The term *development* means any man-made change to improved or unimproved real estate, including but not limited to buildings, other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials.** A hydrologic and hydraulic analysis must be performed *prior* to the start of development, and must demonstrate that the development would not cause any rise in base flood levels. No rise is permitted within regulatory floodways.

- Upon completion of any development that changes existing Special Flood Hazard Areas, the NFIP directs all participating communities to submit the appropriate hydrologic and hydraulic data to FEMA for a FIRM revision. In accordance with 44 CFR, Section 65.3, as soon as practicable, but not later than six months after such data becomes available, a community shall notify FEMA of the changes by submitting technical data for a flood map revision. To obtain copies of FEMA's Flood Map Revision Application Packages, please refer to the FEMA website at http://www.fema.gov/business/nfip/forms.shtm.

Please Note:

Many NFIP participating communities have adopted floodplain management building requirements which are more restrictive than the minimum federal standards described in 44 CFR. Please contact the local community's floodplain manager for more information on local floodplain management building requirements. The West Sacramento floodplain manager can be reached by calling Martin Tuttle, City Manager, at (916) 617-4500. The Yolo County floodplain manager can be reached by calling Lonell Butler, Building Official, at (530) 666-8803.

If you have any questions or concerns, please do not hesitate to call Robert Durrin of the Mitigation staff at (510) 627-7057.

Sincerely,

Gregor Blackburn, CFM, Branch Chief
Floodplain Management and Insurance Branch

cc:
Martin Tuttle, City Manager, West Sacramento
Lonell Butler, Building Official, Yolo County
Ray Lee, WREA, State of California, Department of Water Resources, North Central Region Office
Robert Durrin, NFIP Planner, DHS/FEMA Region IX
Alessandro Amaglio, Environmental Officer, DHS/FEMA Region IX

Friends of the Swainson's Hawk
717 K Street, Suite 529
Sacramento, Ca. 95814
916-447-4956
www.swainsonshawk.org

April 5, 2013

Ms. Tanis Toland
U.S. Army Corps of Engineers, Sacramento District
Delta Programs Integration & Ecosystem Restoration
1325 J Street
Sacramento, CA 95814

Copy to:
West Sacramento Flood Control Agency
ATTN: John Powderly
1110 West Capitol Avenue
West Sacramento, CA 95691

Comments on the Supplemental Notice of Preparation of an EIR/EIS for the Southport Sacramento River Early Implementation Project (City of West Sacramento)

Dear Ms. Toland and Mr. Powderly,

Friends of the Swainson's Hawk is an IRC 501(c)(3) nonprofit corporation dedicated to promoting public awareness and understanding of the Swainson's Hawk and to the protection and restoration of the Swainson's Hawk and its habitat in California. We previously commented on the Draft EIS/EIS of the West Sacramento Levee Improvements Program, by letter dated August 2, 2010.

Our comments on the Supplemental NOP for the EIR/EIS for Southport levee project follow:

1. Corps vegetation removal policy

We understand that it will be necessary to remove some trees to allow construction of the levees. However, we are very concerned about the detrimental effects of removal of additional trees simply to comply with the discredited Corps of Engineers policy which claims that trees can cause levee failure and therefore should be removed from levees and the area near the base of levees. The Corps policy has been thoroughly discredited by the California Department of Fish and Wildlife (formerly Fish and Game), the U.S. Fish and Wildlife Service, and independent scientists expert on flood protection in the Central Valley.

The project should be designed to remove as few trees as possible. The EIR/EIS should address the detrimental impacts of tree removal to biological and recreational values.

The EIR/EIS should specifically identify those proposed removals of trees and other vegetation which would be undertaken to comply with the Corps policy but otherwise would be unnecessary for this project, and assess the impacts of such tree and vegetation removals. The decision-makers and public are entitled to know the effects upon the environment of the Corps tree and vegetation removal policy as applied to the Southport area.

2. Swainson's Hawks

The Swainson's Hawk is listed as threatened specie under the California Endangered Species Act. The bulk of the Central Valley population of Swainson's Hawk nests in Yolo, Sacramento, Solano, and San Joaquin Counties – all counties which are undergoing major urban expansion. California's Swainson's Hawks migrate to Mexico and southward for the winter. The Swainson's Hawk is known for its fidelity to its nesting territory and existing nests, which is why the loss of existing nest trees is a significant environmental impact upon the Swainsons's Hawk.

Attached as Exhibit A is a map "Swainson's Hawk Nesting Distribution, Yolo County, 2007," published by the Yolo Natural Heritage Program, which shows a substantial concentration of Swainson's Hawk nests in Yolo County, including the Study Area of this Supplemental NOP. More recent documentation may be obtained from the California Department of Fish and Wildlife. The Natural Diversity Database (NDDB) is notoriously incomplete and should not be relied on as an exclusive source of information.

A complete survey for Swainson's Hawk nests should be undertaken throughout the entire Study Area, and adjacent land, during the Swainson's Hawk nesting season. The survey protocols established by the Swainson's Hawk Technical Advisory Committee, and recommended by CDFW should be used. A complete current survey would likely show more nests than on the 2007 nest map (Exhibit A). Loss of foraging habitat due to urban development and vineyard conversions in Sacramento and San Joaquin Counties, the Clarksburg area, and elsewhere in the region may have pushed more of the regional Swainson's Hawk population into the Southport area.

Swainson's Hawk nest trees should not be removed. The EIR/EIS should disclose any nest trees that would be removed by the project. Loss of Swainson's Hawk nest trees as a result of the project should be fully mitigated by planting multiple replacement oaks or cottonwoods as close as possible to the site of the former nest tree, and stewarded and monitored for the appropriate number of years.

There are many large trees, both single and in groves, within the Study Area, including the large area inland from the proposed levee project. These large trees are potential Swainson's Hawk nest habitat, and are presently used by multiple other species. Removal of these trees can and should be avoided, whether for the levee project or for the borrow pits, equipment staging areas, roads, or other infrastructure associated with the construction of the project. The EIR/EIS should

identify any trees that would be removed by the project. Removed trees should be replaced with plantings of similar species as close as feasible to the site of the removed trees.

The Study Area encompasses large areas of grassland which are foraging habitat for Swainson's Hawk. Some of these lands will be used to excavate borrow for the levee project. The EIR/EIS should identify the site of potential borrow pits, disclose the biological values that would be impacted by the excavation of borrow, identify temporal loss of foraging habitat, and specify how the borrow sites will be restored. If borrow sites will be restored to something other than grassland (such as wetland or managed marsh), then the loss of Swainson's Hawk foraging habitat due to the excavation should be mitigated at the standard Yolo County mitigation ratio of 1 acre of Swainson's Hawk foraging habitat preserved by conservation easement or fee title for each acre lost due to excavation of soil and restoration to a different land use not compatible with Swainson's Hawk foraging. There should also be mitigation in place to offset the temporary loss of foraging habitat.

3. Disturbance and Destruction of Riparian Habitat Within the Study Area.

There are existing canals, old borrow pits, and other ponds throughout the Study Area. These ponds, canals, and wetlands are lined with riparian vegetation and trees and may support numerous riparian species. An adequate EIR/EIS for the project would include a biological study of all of these areas to determine what plants, wildlife, and other biological values are present. The presence of the Giant Garter Snake, listed as threatened under the Federal Endangered Species Act, is possible in the canals and possibly in some of the ponds.

The EIR/EIS should show how the project will avoid impacting these ponds, canals, and wetlands. There is plenty of land available for borrow pits that would not impact existing riparian and wetland values of these areas. The Study Area includes linear flooded borrow pits lined with dense riparian vegetation and trees which parallels the south side of the cross-levee between the Sacramento River and ship channel, and a canal running southward from the cross levee which is lined with riparian vegetation and trees which merit further study and protection.

Thank you for the opportunity to comment.

Respectfully submitted,

Judith L. Lamare,
President, Friends of the Swainson's Hawk, Inc.

James P. Pachl,
Legal Counsel, Friends of the Friends of the Swainson's Hawk, Inc.

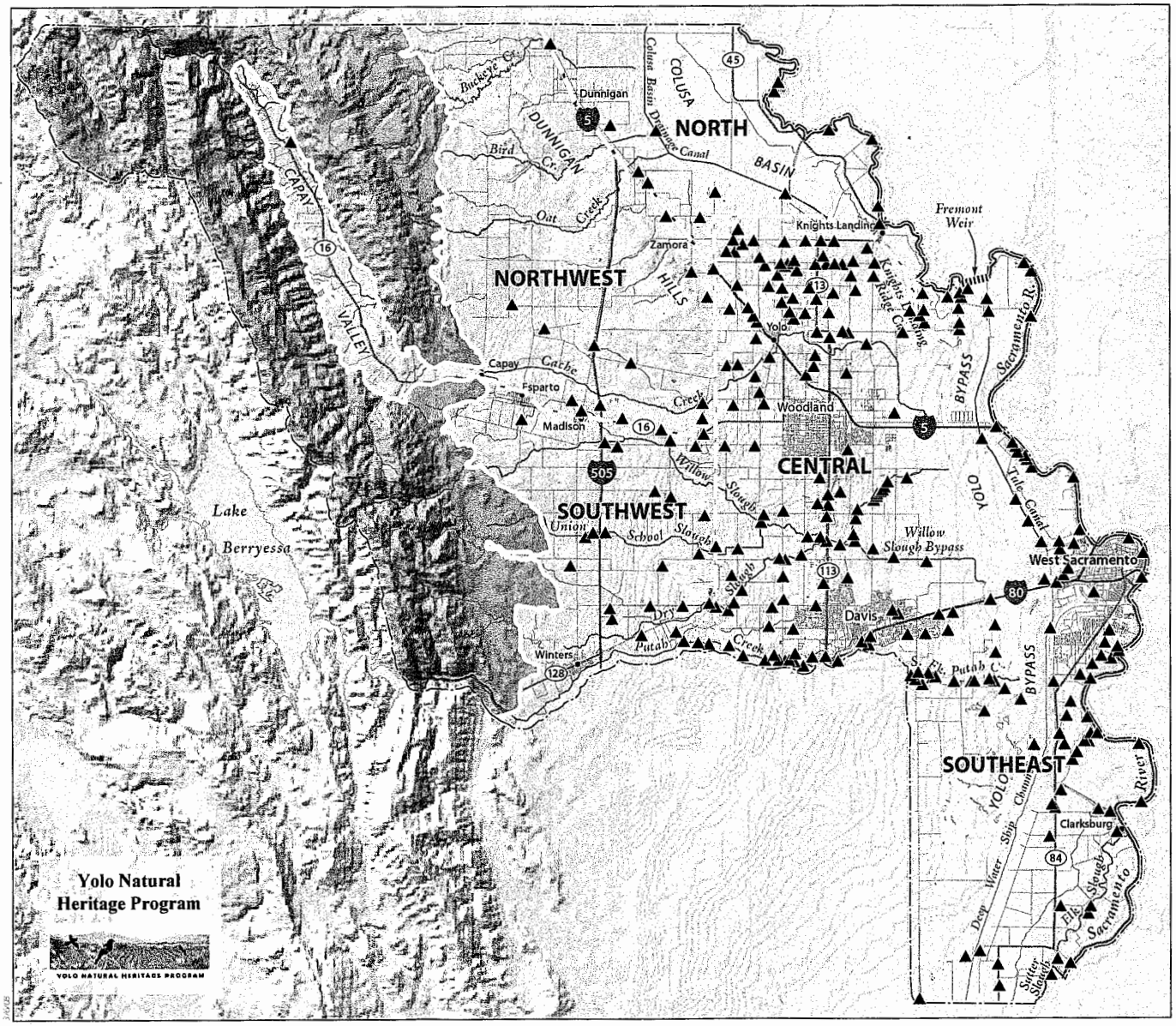

Figure 6-1
Swainson's Hawk Nesting Distribution, Yolo County, California, 2007

LEGEND

- Yolo County Boundary
- Study Area Boundary
- Survey Unit Boundary
- Outside Study Area
- 2007 Swainson's Hawk Nesting Territory

NORTH

0 2 4 6 8 10
Miles

Date: Jan 21, 2008

Technology & Associates
International Consultants

(A)

The Southport Sacramento River Early Implementation Project Supplemental Scoping

WSAFCA
West Sacramento Area Flood Control Agency

US Army Corps of Engineers
Sacramento District

Comment Card

Name: JOHN GABRI Date: 3/ /13

Telephone: 916-371-4812 Email: JB611839@YAHOO.COM

Affiliation: RESIDENT ON GREGORY AVE Title (if applicable): —

Street Address: 4250 GREGORY AVE. W.S.

City: WSACTO State: CA Zip: 95691

Thank you for your interest in this flood risk-reduction effort. The West Sacramento Area Flood Control Agency and the U.S. Army Corps of Engineers value your input regarding this Early Implementation Project. Please provide us with your comments regarding the scope of the Environmental Impact Statement/ Environmental Impact Report being prepared for this project. Please write in the space below legibly.

For your convenience, you may take this self-addressed card home, fill it out, and fold it in half and mail it. You may also send comments via email to Megan Smith at *megan.smith@icfi.com* or Tanis Toland at *tanis.j.toland@usace.army.mil*. **All comments must be received or postmarked by April 8, 2013**.

- Megan Smith, ICF International, 630 K Street, Suite 400, Sacramento, CA 95814
- Tanis Toland, U.S. Army Corps of Engineers, Sacramento District, Delta Programs Integration & Ecosystem Restoration, 1325 J Street Sacramento, CA 95814

I NEED TO HAVE A 1 ON 1 MEETING ABOUT THE PROPOSED LOOP ROAD EXTENSION ONTO GREGORY AVE

FEEL FREE TO CALL ME AT ANY TIME

JOHN B GABRI JR

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY EDMUND G. BROWN JR., GOVERNOR

CENTRAL VALLEY FLOOD PROTECTION BOARD
3310 El Camino Ave., Rm. 151
SACRAMENTO, CA 95821
(916) 574-0609 FAX: (916) 574-0682
PERMITS: (916) 574-2380 FAX: (916) 574-0682

April 10, 2013

Mr. John Powderly
I/C of West Sacramento Area Flood Control Agency
1110 West Capitol Avenue, 2nd Floor
West Sacramento, California 95691

Subject: Southport Sacramento River Early Implementation
SCH Number: 2011082069
Document Type: Notice of Preparation

Dear Mr. Powderly:

Staff of the Central Valley Flood Protection Board (Board) has reviewed the subject document and provides the following comments:

The proposed project is located adjacent to or within the Sacramento River and Deep Water Ship Channel which is under the jurisdiction of the Central Valley Flood Protection Board. The Board is required to enforce standards for the construction, maintenance, and protection of adopted flood control plans that will protect public lands from floods. The jurisdiction of the Board includes the Central Valley, including all tributaries and distributaries of the Sacramento River, the San Joaquin River, and designated floodways (Title 23 California Code of Regulations (CCR), Section 2).

A Board permit is required prior to starting the work within the Board's jurisdiction for the following:

- The placement, construction, reconstruction, removal, or abandonment of any landscaping, culvert, bridge, conduit, fence, projection, fill, embankment, building, structure, obstruction, encroachment, excavation, the planting, or removal of vegetation, and any repair or maintenance that involves cutting into the levee (CCR Section 6);

- Existing structures that predate permitting or where it is necessary to establish the conditions normally imposed by permitting. The circumstances include those where responsibility for the encroachment has not been clearly established or ownership and use have been revised (CCR Section 6);

- Vegetation plantings will require the submission of detailed design drawings; identification of vegetation type; plant and tree names (i.e. common name and scientific name); total number of each type of plant and tree; planting spacing and irrigation method that will be utilized within the project area; a complete vegetative management plan for maintenance to prevent the interference with flood control, levee maintenance, inspection, and flood fight procedures (CCR Section 131).

Vegetation requirements in accordance with Title 23, Section 131 (c) states "Vegetation must not interfere with the integrity of the adopted plan of flood control, or interfere with maintenance, inspection, and flood fight procedures."

The accumulation and establishment of woody vegetation that is not managed has a negative impact on channel capacity and increases the potential for levee over-topping. When a channel develops vegetation that then becomes habitat for wildlife, maintenance to initial baseline conditions becomes more difficult as the removal of vegetative growth is subject to federal and State agency requirements for on-site mitigation within the floodway.

Hydraulic Impacts - Hydraulic impacts due to encroachments could impede flood flows, reroute flood flows, and/or increase sediment accumulation. The project should include mitigation measures for channel and levee improvements and maintenance to prevent and/or reduce hydraulic impacts. Off-site mitigation outside of the State Plan of Flood Control should be used when mitigating for vegetation removed within the project location.

The permit application and Title 23 CCR can be found on the Central Valley Flood Protection Board's website at http://www.cvfpb.ca.gov/. Contact your local, federal and State agencies, as other permits may apply.

The Board's jurisdiction, including all tributaries and distributaries of the Sacramento River and the San Joaquin River, and designated floodways can be viewed on the Central Valley Flood Protection Board's website at http://gis.bam.water.ca.gov/bam/.

If you have any questions, please contact me by phone at (916) 574-0651, or via email at jherota@water.ca.gov.

Sincerely,

James Herota
Staff Environmental Scientist
Projects and Environmental Branch

cc: Governor's Office of Planning and Research
State Clearinghouse
1400 Tenth Street, Room 121
Sacramento, California 95814

----- Original Message -----
From: stargazer525@surewest.net [mailto:stargazer525@surewest.net]
Sent: Wednesday, April 03, 2013 06:24 PM
To: Smith, Megan; tanis.j.toland@usace.army.mil <tanis.j.toland@usace.army.mil>
Subject: Southport EIP Supplemental Scoping Comment Card

Good afternoon Megan and Janis,

Thank you for answering my questions and talking to me at the Public and Agency Input meeting on March 28th.

I pasted my comment card information below and also attached my contact information and comments in a MS Word document that I attached.

Thank you for acknowledging my concerns.

Lucille Pacheco
916-647-6661
916-203-9257

The Southport Sacramento River Early Implementation Project Supplemental Scoping-Comment Card
Name: Lucille Pacheco Date: 4/3/2012
Telephone: 916-647-6661 Email: stargazer525@surewest.net
Affiliation: Title (if applicable)
Street Address: 9148 Laguna Center Circle
City: Elk Grove State: California Zip: 95758

Major Concerns

Hazards Due to Major Construction/Chevron Gasoline Pipe Contractor error during evasive construction work to a levee could lead to catastrophic consequences. For example, slurry cut-off walls through the levee seem more dangerous to the levee than rock slope protection on the waterside of the levee. Also, a Chevron gasoline line runs through many residents' properties not far from levee construction. Careless employees damaging underground pipes would not only negatively impact the environment, but they would also endanger the public by weakening or severely damaging the levee. What safeguards does the city have to guard against contractor or employee error?

Water Level, Water Quality and the Effects on Wells Historically, construction in the area decreased the successful operation of residents' wells, residents' only water supply for homes and irrigation. This major construction project surpasses any other construction project in the past. For example, the recent sewage construction and housing developments in the area required residents to immediately pay substantial amounts of money to drill deeper wells to

secure their water supply. How will the city help property owners if the levee construction negatively impacts residents' water supply?

An Increase in Crime

Up until about 1990 the people living in the area designated as Section B in your Statement/Report experienced very little crime. Levee upgrades eliminated and replaced trees, shrubs and other plant life with rock. The introduction of signs restricting access to fishing spots eliminated the presence of local people along the banks of the river. Local residents knew the people using the levee areas. With no visible presence of law enforcement along this vast area residents relied on this unofficial neighborhood watch. The levee between the two trestles became a point where criminals could uninterruptedly scope out people's property to burglarize farms and houses. Adding recreational areas for the general public allows more opportunities for criminals to stake out property by blending in with others using the new recreational areas. In additional to burglary we must always expect the possibility of vandalism or even terrorism. As Southport continues to develop and the population increases the Section B levee area becomes a bigger target. Will the city increase law enforcement along the levees?

Access to Property/Increase of Traffic

A long levee construction period will make it difficult for residents to get to and from their property. Some residents depend on access for private business such as selling or transporting produce. After the completion recreational areas will increase traffic on country roads currently unsuitable for the increased traffic. Will the city develop roads to maintain residents' easy access and to handle the additional traffic?

Declining Property Values

If residents need to sell property during the long levee construction period they will face much lower property values particularly in the construction zones. Property owners will see a worse decline in values than what they've seen due to the housing crisis. How will the city monitor the appearances of the construction zones over the years?

The Southport Sacramento River Early Implementation Project Supplemental Scoping-Comment Card

Name: Lucille Pacheco **Date**: 4/3/2012

Telephone: 916-647-6661 **Email**: stargazer525@surewest.net

Affiliation: **Title** (if applicable)

Street Address: 9148 Laguna Center Circle

City: Elk Grove **State**: California **Zip**: 95758

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MILLER STARR REGALIA

1331 N. California Blvd.
Fifth Floor
Walnut Creek, CA 94596

T 925 935 9400
F 925 933 4126
www.msrlegal.com

Wilson F. Wendt

April 8, 2013

VIA EMAIL AND FEDERAL EXPRESS

Megan Smith, Project Manager (megan.smith@icfi.com)
ICF International
630 K Street, Suite 400
Sacramento, CA 95814

Tanis Toland (tanis.j.toland@usace.army.mil)
U. S. Army Corps of Engineers, Sacramento District
Delta Programs Integration and Ecosystem Restoration
1325 J Street
Sacramento, CA 95814

Re: Seecon Financial and Construction Co., Inc.; Comments on Supplemental Notice of Preparation and Scope of Environmental Review for Southport Sacramento Early Implementation Project

Dear Ms. Smith and Ms. Toland:

Miller Starr Regalia represents Seecon Financial and Construction Co., Inc. ("Seecon") in its ownership and operation of property that would be affected by the Southport Sacramento River Early Implementation Project ("Southport Project"). We are in receipt of the Supplemental Notice of Preparation ("Supplemental NOP") of an Environmental Impact Statement/Environmental Impact Report ("EIR/EIS") for the Southport Project, dated March 7, 2013, whereby the U.S. Army Corps of Engineers ("Corps") and West Sacramento Area Flood Control Agency ("WSAFCA") have requested input on the scope and content of the EIR/EIS. This letter is a response to that request and is submitted in accord with the California Environmental Quality Act ("CEQA") and the National Environmental Policy Act ("NEPA").

Seecon has numerous concerns about the Southport Project, as it threatens to upset longstanding land use policies and goals adopted by the City of West Sacramento ("City"), and has the potential to cause numerous impacts to the local environment, including health risks to local residents and other sensitive receptors. Accordingly, Seecon urges the Corps and WSAFCA to consider each of the issues identified in this letter as these agencies undertake preparation of the EIR/EIS.

Seecon has developed this list of issues based on publicly available details about the Southport Project, and reserves its right to submit further public comment as the CEQA and NEPA processes develop.

I. PROJECT DESCRIPTION AND ENVIRONMENTAL SETTING.

The Southport Project, at first blush, may not appear to have many constituent components, consisting predominantly of the construction of levees and the excavation of borrow sites. However, the fragility of the surrounding environment and presence of unique resources within and nearby the project footprint will require that the EIR/EIS's project description and environmental setting sections be very detailed.

II. REQUEST TO REMOVE SEECON PROPERTY FROM ADDITIONAL STUDY AREA.

We have indicated the extent of the Seecon Property on the enclosed copy of Figure 1 that was attached to the Supplemental NOP. As you can see, it constitutes a significant amount of property within Segment F of the Southport Project. Seecon has informed WSAFCA on numerous occasions that they will not consent to the taking of their property for what we consider unnecessary and excessive flood control improvements and further informed them that they <u>will not consent to sell WSAFCA any borrow material from the Seecon Property</u>. WSAFCA officials have advised Seecon that they will acquire borrow materials <u>only</u> from willing sellers. Given that context, we are amazed that the Supplemental NOP includes approximately a third of the Seecon Property (designated by hatching in Figure 1) as a part of the Additional Study Area, the announced purpose of which is mainly to analyze the impacts generated by additional soil borrow sites that may be employed to provide borrow material needed to construct the Southport Project. The hatched area indicated on Figure 1 on the Seecon Property as an "additional soil borrow site" is one in which vesting tentative maps have been approved; final maps have been filed and are being processed for residential development; some residential structures have been and are continuing to be built; extensive subdivision infrastructure has been constructed; and the entitlements for development are covered by an existing and valid development agreement.

If WSAFCA's statements are valid, there is <u>absolutely no potential</u> that borrow material will be taken from the hatched area shown on the Seecon Property. For that reason, we request that you amend and revise Figure 1 to delete that portion of the Seecon Property indicated by hatching from the property defined as Additional Study Area. Any continued attempt to assess and analyze impacts upon this portion of the Seecon Property, as outlined in the Supplemental NOP, will provide no useful or meaningful information (since Seecon has said on many prior occasions and reiterates their determination <u>not to sell any borrow material to WSAFCA or any other agency</u>) and will simply guarantee continued strong

opposition throughout the EIS/EIR process. We urge you to acknowledge that the portion of the Seecon Property affected by the Supplemental NOP will not be the subject of further analysis and is being deleted from the Additional Study Area.

III. ANALYSIS OF DRASTIC AND UNNECESSARY IMPACTS UPON PRIVATE PROPERTY.

The Southport Project, no matter how it is finally designed and implemented, will have significant adverse impacts upon private property. The currently designated preferred alternative for flood control improvements on the Seecon Property is a setback levee with seepage berm. This alternative is the most destructive of private property and the one with the most unnecessarily large take of private property.

WSAFCA consultants originally advocated an adjacent levee as the preferred alternative. On behalf of our clients, we have submitted to WSAFCA and its Board literally thousands of words of materials advocating the use of the adjacent levee alternative on the Seecon Property. This would greatly reduce the amount of private property that was required for acquisition and would vastly reduce the amount of borrow materials required. The implementation of the adjacent levee alternative would also significantly lessen the amount of environmental damage. All of the environmental impacts upon private property need to be carefully analyzed and mitigation measures must be set out.

While the EIS/EIR is not concerned with the legality of a proposed take of private property, you are charged with conducting an accurate and complete analysis of environmental impacts upon private property as well as the Sacramento River. Seecon has advocated the adjacent levee alternative as a means of reducing impacts and will challenge judicially any attempt to take the excessive and unnecessary amounts of private property that will be required for the setback levee alternative, if that alternative is ultimately selected.

IV. ANALYSIS REGARDING IMPACTS ON AGRICULTURAL RESOURCES.

Maps published by the State of California Department of Conservation demonstrate the Southport Project study area, as depicted in Figure 1 of the Supplemental NOP (including both the "Original Study Area" and the "Supplemental Study Area," collectively referred to herein as the "Project site"), encompasses lands designated as Prime Farmland and Farmland of Local Importance. At least some of the Project site is designated for agricultural production in the City's General Plan and Zoning Ordinance, and aerial satellite maps show such areas and additional lands that comprise the Project site may be operated as farms. Accordingly, the EIS/EIR must quantify the acreage of agricultural lands that will be impacted and lost by the Southport Project, and

analyze the effects on such lands of constructing levees, excavating borrow sites, and disposing of soil on disposal sites. You must set out appropriate mitigation measures to address these impacts upon agricultural lands to address these impacts, including the requirement to purchase additional agriculturally committed land to replace the lost agricultural land.

V. ANALYSIS REGARDING VISUAL RESOURCES.

The Southport Project would appear to entail the excavation of significant amounts of open space/agricultural lands, if not the great majority of such lands within the Southport area of the City. Additional lands appear to serve as the site of borrow and disposal of soils. In light of these activities, impacts to visual resources would occur on a temporary basis during construction and, depending on whether and how the restoration of land comprises part of the project, permanent impacts could occur.

VI. ANALYSIS REGARDING IMPACTS ON HYDROLOGY, WATER QUALITY, AND GROUNDWATER RESOURCES.

The Supplemental NOP provided that the Southport Project construction area would extend along the west bank of the Sacramento River for approximately six miles. Given the width of the levee along this alignment which potentially could extend hundreds of feet inland, it can be anticipated the Southport Project will involve a momentous amount of earthwork in the immediate proximity of the Sacramento River. Moreover, it appears various borrow sites are sited within proximity of the Sacramento River Deep Water Ship Channel. Soil erosion and sedimentation can be anticipated at significant levels, especially given it is anticipated the project would involve the removal of riverfront vegetation and placement of riprap or other rock slope protection along the shoreline. Additionally, impacts upon drainage patterns, hydrology, water quality and groundwater must be analyzed. Of particular concern are the impacts caused by the implementation of the setback levee alternative which will require enormous amounts of borrow material (as evidenced by the need for this Supplemental NOP). One of the primary sources of borrow material will be extensive excavation of property on the river side of the setback levee. The groundwater is very high in these locations and this can only result in ponding and the creation of corresponding ongoing environmental problems including vector control and other impacts injurious to public health and safety.

VII. ANALYSIS REGARDING IMPACTS ON FISH AND AQUATIC RESOURCES; VEGETATION AND WETLANDS; AND WILDLIFE.

The Southport Project has the potential to significantly impact fish and aquatic resources; vegetation and wetlands; and wildlife, wildlife habitats, and

migration corridors. Accordingly, analysis in the EIR/EIS of these various impacts is required.

VIII. ANALYSIS REGARDING GEOLOGY, SEISMICITY, AND FLOOD MANAGEMENT.

The Southport Project would involve the deconstruction and construction of a levee during what potentially may be an extended duration. During this timeframe, it is possible that a significant seismic event may occur, or a significant flooding event may occur. The EIR/EIS should contemplate and address whether lands within the City will be adequately protected during the period of project construction.

It also appears that the Southport Project may entail the excavation of fields and other open space area that may have been subject to subsidence in the past, and which lies near an area waterway. The EIS/EIR should evaluate the wisdom of extracting substantial materials in such areas, including dangers posed to nearby, newly constructed levees, and whether such excavation will leave borrow sites undevelopable in the future.

IX. ANALYSIS REGARDING IMPACTS ON TRANSPORTATION AND NAVIGATION.

The Southport Project potentially would affect traffic and circulation in a number of ways, all of which impacts must be fully analyzed.

X. ANALYSIS REGARDING NOISE IMPACTS.

The Southport Project potentially would affect the local noise environment in a number of ways: To adequately analyze noise impacts, the EIR/EIS must identify all appropriate sensitive receptors in the Southport Area, the City at large, Yolo County, Solano County, Sacramento County, and the City of Sacramento. The EIR/EIS also must identify sources of noise by specifying both their location and magnitude, such as by providing expected equipment lists and studies demonstrating average and maximum noise levels associated with the operation of said equipment. Finally, the EIR/EIS must, using the above information, evaluate each of the above impacts under appropriate temporal scenarios, such as under existing, short-term, and long-term scenarios. If the analysis discloses there is an existing, substandard condition to which the project will contribute, a special threshold of significance must be developed for such impacts. (*See Gray, supra,* 167 Cal.App.4th at 1122-1123.)

XI. ANALYSIS REGARDING AIR QUALITY IMPACTS.

The Southport Project entails an extensive amount of earthwork, which will cause the emission of significant amounts of air pollutants. Such sources will include, without limitation: excavators, graders, bulldozers, and other on-site construction equipment; portable auxiliary equipment; diesel trucks associated with the delivery of materials and soils; diesel trucks associated with the removal of solid waste; trips associated with construction workers and other off-site trips; paving activities; and dust associated with on- and off-site vehicle trips and activities.

In addition to direct impacts of the Southport Project's excavation and levee construction activities, the project would displace planned uses (e.g., residential and commercial uses). The construction and operation of these displaced uses also have the potential to result in air quality impacts that necessitate evaluation.

XII. ANALYSIS REGARDING CULTURAL RESOURCES.

The Southport Project would disrupt substantial amounts of soil that could contain prehistoric, historic, and archaeological artifacts, as well as Native American human remains. In addition, the Project site appears to contain numerous City landmarks, including without limitation the Heritage Oak Park Site, Redwood Park, Linden South/Paik North Site, the Clarksburg Branch Line Trail, Eagle Point Park, Lake View Park, Bridgeway Lakes, Bridgeway Lakes Community Park, and Valley Oak Grove. (*See, e.g.,* City of West Sacramento Landmarks; *see* General Plan Background Document, p. VII-16.) The impacts of excavation, construction, and other project activities on each affected resource must be disclosed in the EIR/EIS.

XIII. ANALYSIS REGARDING UTILITIES AND PUBLIC SERVICES.

The EIR/EIS should evaluate all issues regarding utilities and public services.

XIV. ANALYSIS REGARDING LAND USE/PLANNING; POPULATION/HOUSING; RECREATION; AND SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND COMMUNITY EFFECTS.

The Southport Project has the potential to upset a number of longstanding land use policies, and the EIR/EIS should take careful account of the project's consistency with the City's General Plan and other applicable land use documents.

XV. SCOPE OF ALTERNATIVES ANALYSIS

The EIR/EIS must identify a reasonable range of project alternatives, focusing on alternatives to the proposed Southport Project that eliminate or reduce significant environmental impacts. The EIR/EIS need not discuss alternatives that are infeasible but, if an alternative is determined to be infeasible, the EIR/EIS should identify the reasons for this determination and provide evidence supporting it. For instance, if an alternative is determined to not be economically feasible, detailed financial data should be provided evidencing this conclusion.

Here, the EIR/EIS should discuss, in detail, various construction alternatives to the proposed Southport Project, which appears to contemplate construction of setback levees within most, if not all, of the Project site. Alternative construction methods to be studied in detail should include the use of adjacent levees with cutoff walls and/or a seepage berm in each of the Project site segments.

In section III of this letter we have discussed the enormous difference in severity of impacts upon private property caused by the setback levee alternative as opposed to the adjacent levee alternative, which we have and continue to advocate. The EIR/EIS needs to examine the difference in environmental impacts caused to private property by each alternative and contrast needed mitigation measures to allow an informed decision as to the ultimately determined preferred alternative for flood protection improvements.

* * *

Seecon appreciates the opportunity to provide input on the scope of the Southport Project EIS/EIR, and participating in future review and comment of the document ultimately prepared by the Corps and WSAFCA. If you have any questions or concerns, please do not hesitate to contact me at 925.935.9400.

Very truly yours,

MILLER STARR REGALIA

Wilson F. Wendt

WFW:SRM/kli
cc: Kenneth Ruzich
Ralph Nevis
WSAFCA Board Members
Lori Clamurro Chew - DWR
Clients

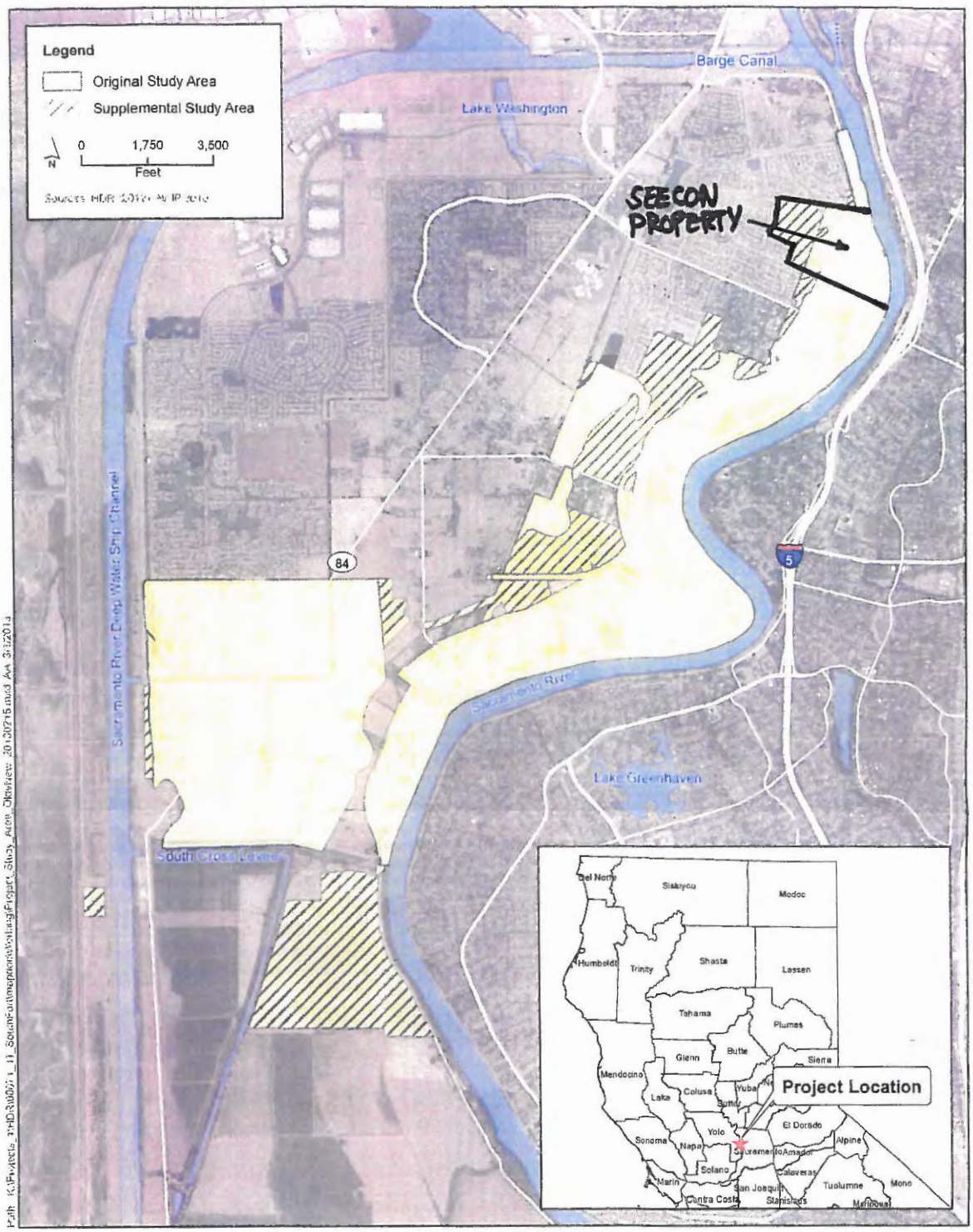


Figure 1
EIP Study Area

MILLER STARR REGALIA

1331 N. California Blvd.
Fifth Floor
Walnut Creek, CA 94596

T 925 935 9400
F 925 933 4126
www.msrlegal.com

Wilson F. Wendt

April 8, 2013

VIA EMAIL AND FEDERAL EXPRESS

Megan Smith, Project Manager (megan.smith@icfi.com)
ICF International
630 K Street, Suite 400
Sacramento, CA 95814

Tanis Toland (tanis.j.toland@usace.army.mil)
U. S. Army Corps of Engineers, Sacramento District
Delta Programs Integration and Ecosystem Restoration
1325 J Street
Sacramento, CA 95814

Re: Forecast Land Investment, LLC; Request for Removal of Property From Additional Study Area Under Supplemental Notice of Preparation

Dear Ms. Smith and Ms. Toland:

Our office represents Forecast Land Investment, LLC ("Forecast"). We also represent Seecon Financial and Construction Co., Inc. ("Seecon"). On behalf of Seecon we are contemporaneously submitting comments on the Supplemental Notice of Preparation and requesting that the Seecon property designated on Figure 1 of the Supplemental NOP be deleted and removed from the area of additional study. We are reiterating that request on behalf of Forecast in connection with a small, approximately ten-acre parcel of real property located within Segment F of the Southport Early Implementation Project Reach and indicated on the map attached hereto (the "Forecast Property").

In our comment letter filed on behalf of Seecon, we noted that Seecon has opposed the selection of the setback levee alternative as the preferred alternative for flood control improvements on the Seecon property and has refused and will continue to refuse to sell borrow material to WSAFCA or any other agency. WSAFCA officials have informed us that they will not acquire borrow materials except from ready and willing sellers.

The purpose of this letter is to request that you modify Figure 1 to the Supplemental NOP and delete the Forecast Property from the additional study area to be looked as a possible additional soil borrow site (see attachment). There is absolutely no possibility that Forecast will sell borrow material to anyone and the enunciated

policy of WSAFCA makes clear that there is no possibility the borrow material will be taken from the Forecast Property.

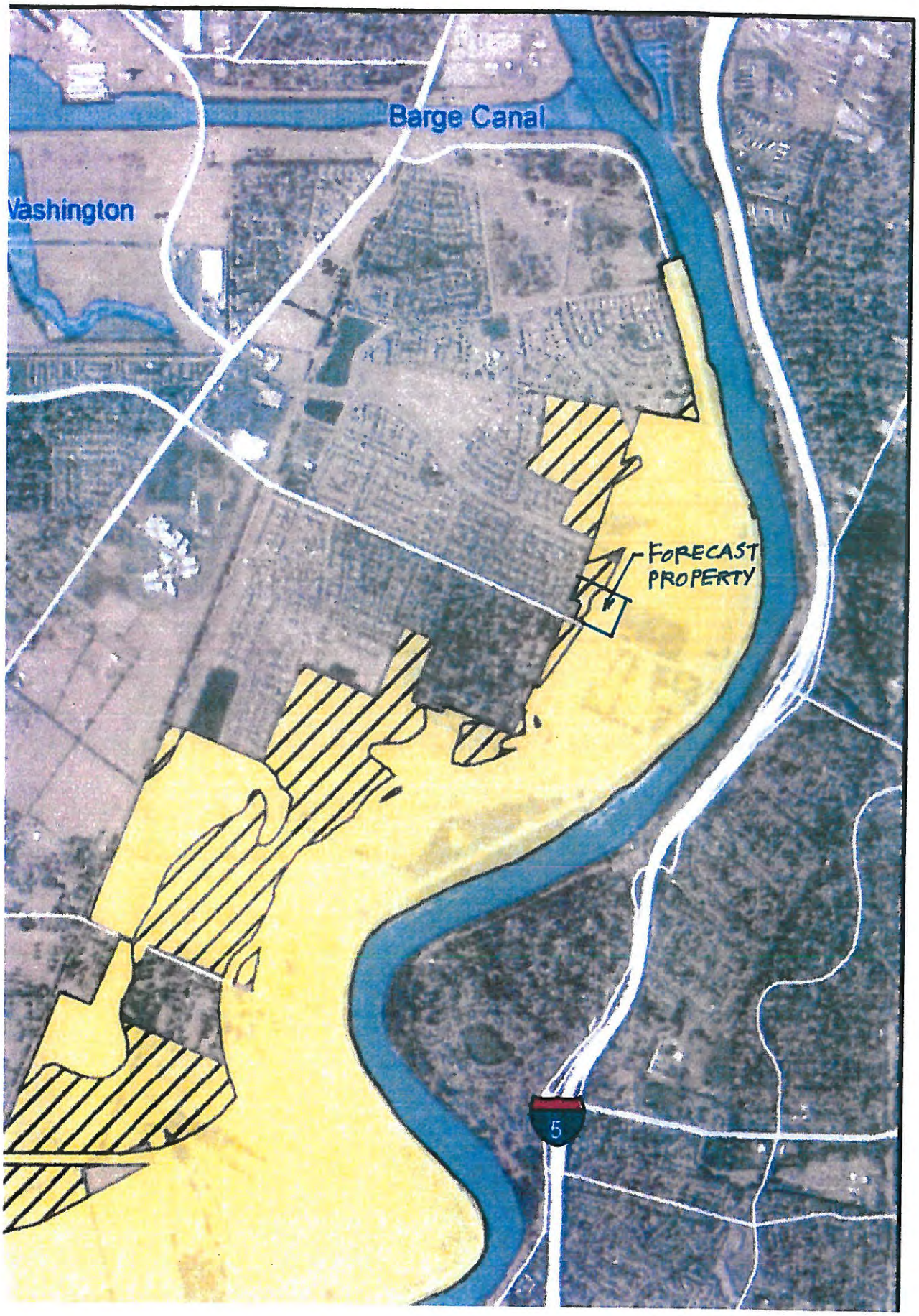
We therefore request that you acknowledge this letter and remove the Forecast Property from any further consideration under the Supplemental NOP or the ongoing EIR/EIS.

Very truly yours,

MILLER STARR REGALIA

Wilson F. Wendt

WFW:jj
cc: Kenneth Ruzich
Ralph Nevis
WSAFCA Board Members
Lori Clamurro Chew – DWR
Clients


Barge Canal
Washington
FORECAST PROPERTY
5

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Wilson F. Wendt
wilson.wendt@msrlegal.com

April 11, 2013

VIA U.S. MAIL AND EMAIL

President William Denton and
Members of the Board
Board of Directors
West Sacramento Area Flood Control Agency
1110 West Capitol Avenue, 2nd Floor
West Sacramento, CA 95691

Re: Objections to Creation of the West Sacramento Flood Plain Mitigation Bank; Southport Early Implementation Plan

Honorable President Denton and Members of the Board:

As you are aware, our office represents Seecon Financial and Construction Co., Inc. ("Seecon"), the owners of real property in Segment F of the Southport Early Implementation Project ("Southport EIP"). For over a year we have been involved in reviewing and commenting upon actions of WSAFCA in designing and implementing the Southport EIP. Our comments are voluminous and have touched on a number of issues in the processing including our perceived lack of transparency in the process. We are surprised and shocked that after literally tens of thousands of words of reports and commentary presented to the Board and the public by WSAFCA staff and consultants, to our knowledge, the words "Flood Plain Mitigation Bank" have never appeared in any public discussion or in response to the Public Records Act requests we have filed on behalf of our client with WSAFCA until the Flood Protection Progress Report for April 1, 2013 attached to your agenda for your meeting of April 11, 2013, as Item No. 9, just posted. That innocuous statement appears on page 3 of the Flood Protection Progress Report and reads as follows:

> "DWR released its preliminary funding recommendations to direct Proposition 1(e) funding to flood management projects and activities in support of the Central Valley Flood Protection Plan (CVFPP) in Conservation Strategy. WSAFCA's titled 'State of California West Sacramento Flood Plain Mitigation Bank' has been initially recommended for approximately five million dollars in funding."

The original consultant's recommendation to the Board for the preferred alternative for flood control improvements in Segment F was an Adjacent Levee. In May, 2012, WSAFCA staff and consultants cited a "Value Engineering Report" as the reason that the setback levee should be selected as the preferred alternative in Segment F to proceed to 65% design completion, despite failing to report back to the Board on the advantages and disadvantages of a Setback Levee in Segment F, an analysis that was supposed to look at "technical feasibility, regulatory acceptability, constructability, long term maintenance issues (and) impacts to the community. . .". This recommendation was adopted by the Board despite the fact that the Setback Levee is several million dollars more expensive than the Adjacent Levee and the alternative requiring the most borrow material and the one which is the most injurious to private property. One of the reasons advanced for the Board's choice was that WSAFCA could extract millions of dollars more from the State if the Setback Levee were selected, thus making the ultimate cost to WSAFCA lower than their share if the Adjacent Levee alternative were selected.

We have pointed out on many occasions that under principles of Eminent Domain law, WSAFCA is limited to taking only that amount of private property necessary to effect the purpose of the take; that being the construction of flood protection improvements. Nowhere in all the materials prepared and presented to the Board was there an explanation that WSAFCA proposed to create a "Flood Plain Mitigation Bank", an enterprise that would be imposed upon private property owned by West Sacramento businesses and residents and would produce extra mitigation credits that would be sold for use by the State of California to offset environmental impacts of other projects in other locations throughout the State of California totally unrelated to the Southport E.I.P. This creation of a Mitigation Bank enterprise on the back of West Sacramento property owners for the benefit of other governmental and, perhaps, private interests, is inequitable, improper and beyond the legal authority of WSAFCA. We urge the Board to direct staff to immediately begin an investigation of how this Application for funding of a Mitigation Bank was developed and the unauthorized Application filed with the Department of Water Resources (see Exhibit B). That investigation should focus, among other things, upon why no public discussion was held at any time as to the creation of such a Mitigation Bank enterprise.

Applications Filed With the State of California Department of Water Resources: We just became aware of the proposed creation of a Mitigation Bank when our research was triggered by the Flood Protection Progress Report posted with today's agenda.

On December 13, 2012 the Board adopted Resolution 12-12-01, a copy of which is attached as Exhibit A, which, in part, "approved the filing of an application to the Department of Water Resources for grant funding under the Central Valley Flood System Conservation Framework and Strategy Program to fund the construction of habitat in the Southport Sacramento River Early Implementation Project Setback

Area". Nothing in the resolution referenced the creation of a "Flood Plain Mitigation Bank" enterprise with "for sale" mitigation credits created, to be sold to mitigate impacts of other projects of other agencies or private persons outside of the Southport area and totally unrelated to the Southport Early Implementation Plan. The public was not made aware that a "Mitigation Bank" would be created involving the setback area on private property for mitigation of impacts caused by projects in remote areas of the state.

On January 7, 2013, WSAFCA staff submitted on Application to DWR for the West Sacramento Flood Plain Mitigation Bank Work Plan, Schedule and Budget, a copy of which is attached as Exhibit B, seeking funding from the $25,000,000 available. That application was clearly for an unauthorized "Flood Plain Mitigation Bank Proposal". Again, nothing in any of the discussion before the Board or the documentation leading up to this submittal had ever referenced the creation of a Mitigation Bank. It is our opinion that Resolution No. 12-12-01 did not authorize the filing by staff of an Application for the creation of a Mitigation Bank and the action of WSAFCA to create and implement such a Mitigation Bank would be beyond the powers of the staff member filing the application and the Agency under their Joint Powers Agreement. These unauthorized actions should be immediately and thoroughly investigated. We are enclosing a legal memorandum setting out the legal reasoning supporting our opinion as Exhibit C.

The Application filed by staff on behalf of the Board with DWR acknowledges that creation of the Mitigation Bank by WSAFCA would be at the periphery of the Agency's powers and subject to "some uncertainties and constraints" The Application states as follows:

> "As a flood risk reduction agency, WSAFCA has limited financial and political ability for habitat restoration beyond that required for project mitigation associated with the Southport EIP. WSAFCA will partner with the state to identify responsible parties for land ownership, bank ownership and operations and maintenance, given that the majority of the mitigation credits will be utilized by the state. Further, WSAFCA and the state will need to work closely together on the financial details of the project to ensure that the interests of both agencies are met."

The creation of a Mitigation Bank by WSAFCA is beyond the scope of the Agency's powers. The resolution adopted by the Board authorizing the filing of the Application with DWR does not authorize the filing of an application for a Mitigation Bank with "for sale" mitigation credits. We have obtained a copy of the Department of the Army Corps of Engineers' permit application dated January, 2013, filed by WSAFCA. In that application there is a general description of the flood control

improvements and the fact that certain of the setback areas would be used for fish and wildlife habitat restoration. Nowhere in the application is it stated that a Mitigation Bank enterprise will be created with mitigation credits to be sold for projects outside of the Southport area.

Conclusion: The creation of a Mitigation Bank enterprise by WSAFCA and its continuing maintenance into the future is well beyond its authority under the Joint Powers Agreement or applicable law. The mitigation of impacts for just the Southport EIP on site are more clearly within the Agency's powers and authority. We urge the Agency to commence an investigation of why the concept of the Mitigation Bank enterprise was not clearly and transparently disclosed to the public and why the Application was submitted without proper Board authorization. We urge the Board to withdraw the Application to DWR to avoid further complications to the already difficult process of building needed levees in the Southport area, which complications may delay the approval of the environmental documents and cause the Agency to miss applicable Federal and State funding windows.

It is shameful that WSAFCA would attempt to create this Mitigation Bank enterprise by unnecessarily displacing families from their homes and taking exorbitant and unnecessary amounts of private property for a commercial enterprise which could generate millions of dollars of profit from sale of credits for projects totally unrelated to Southport. At least we now understand why WSAFCA switched positions leading to the 65% design stage, abandoned the Adjacent Levee alternative, while advancing the more lucrative Setback Levee alternative.

Very truly yours,

MILLER STARR REGALIA

Wilson F. Wendt

WFW:jj

cc: Mr. Kenneth Ruzich
Mr. Ralph Nevis
Ms. Alicia E. Kirchner, USACE
Mr. Thomas D. Karvonen, USACE
Mr. Marc A. Fugler, USACE
Ms. Tanis Toland, USACE
Ms. Megan Smith, ICF
Mr. Mark Cowin, Director, DWR
Ms. Cathy Crothers, Chief Legal Counsel, DWR
Ms. Lori Clamurro Chew, DWR
Clients

Resolution 12-12-01

RESOLUTION OF BOARD OF DIRECTORS OF THE WEST SACRAMENTO AREA FLOOD CONTROL AGENCY APPROVING THE APPLICATION FOR GRANT FUNDS FROM THE CENTRAL VALLEY FLOOD SYSTEM CONSERVATION FRAMEWORK AND STRATEGY PROGRAM UNDER THE DISASTER PREPAREDNESS AND FLOOD PREVENTION BOND ACT OF 2006 (Proposition 1E)

WHEREAS, the Legislature and Governor of the State of California have provided funds for the program shown above; and

WHEREAS, the Department of Water Resources has been delegated the responsibility for the administration of this grant program, establishing necessary procedures; and

WHEREAS, said procedures established by the Department of Water Resources require a resolution certifying the approval of application(s) by the Applicants governing board before submission of application(s) to the State; and

WHEREAS, the Applicant, if selected, will enter into an agreement with the State of California to carry out the project.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the West Sacramento Area Flood Control Agency.

1. Approves the filing of an application to the Department of Water Resources for grant funding under the Central Valley Flood System Conservation Framework and Strategy Program to fund the construction of habitat in the Southport Sacramento River Early Implementation Project setback area,

2. Certifies that Applicant understands the assurances and certification in the application; and,

3. Certifies that Applicant or title holder will have sufficient funds to operate and maintain the project(s)consistent with the land tenure requirements; or will secure the resources to do so: and

4. Certifies that it will comply with all provisions of Section 1771.5 of the California Labor Code, and,

5. If applicable, certifies that the project will comply with any laws and regulations including, but not limited to, the *California Environmental Quality Act* (CEQA), legal requirements for building codes, health and safety codes, disabled access laws, and, that prior to commencement of construction all applicable permits will have been obtained; and,

6. Appoints the General Manager, or designee, as agent to conduct all negotiations, execute and submit all documents including, but not limited to applications, agreements, payment requests and so on, which may be necessary for the completion of the aforementioned project(s).

PASSED AND ADOPTED by the West Sacramento Area Flood Control Agency on this 13th day of December, 2012, by the following vote.

EXHIBIT A

AYES: Denton, Kristoff, Ramos
NOES: none
ABSTAIN: none
ABSENT: none

William E. Denton, President

ATTEST:

Kenneth A. Ruzich, General Manager

APPROVED AS TO FORM:

James M. Day, Jr., WSAFCA Attorney

Proposal Full View

Print

Applicant Information

Organization Name	West Sacramento Area Flood Control Agency *
Tax ID	**942362970**
Proposal Name	State of California West Sacramento Floodplain Mitigation Bank Proposal *
Proposal Objective	The State of California West Sacramento Floodplain Restoration Bank (Bank) project would create a mitigation and conservation bank that would yield approximately 120 riparian floodplain and endangered species conservation credits, and has the potential to create approximately 21,000 linear feet of restored and enhanced shaded riverine aquatic (SRA)/channel margin habitat available as mitigation credits on a per-linear foot basis. Specifically, the proposed Bank project would create riparian floodplain and off-channel refugia habitat for native fish, including Chinook salmon and Sacramento splittail, and to a limited extent, Central Valley steelhead. The West Sacramento Area Flood Control Agency (WSAFCA) would partially utilize the Bank to fulfill mitigation that will be obligated to the Southport Early Implementation Project (Southport EIP), but substantial credits will remain for use by the State to mitigate for future project impacts resulting from implementation of the Central Valley Flood Protection Plan (CVFPP). *

Budget

Other Contribution	$0.00
Local Contribution	$0.00
Federal Contribution	$0.00
Inkind Contribution	$0.00
Amount Requested	$4,996,957.00 *
Total Project Cost	$4,996,957.00 *

Geographic Information

Latitude *	DD(+/-) 38	MM 31	SS 52
Longitude *	DD(+/-) 121	MM 31	SS 54
Longitude/Latitude Clarification	Location		
County	Yolo *		

EXHIBIT B

Ground Water Basin	Sacramento Valley-Yolo
Hydrologic Region	Sacramento River
Watershed	

Legislative Information

Assembly District	4th Assembly District *
Senate District	3rd Senate District *
US Congressional District	District 5 (CA) *

Project Information

Project Name State of California West Sacram

Implementing Organization	West Sacramento Area Flood Control Agency
Secondary Implementing Organization	MBK Engineers
Proposed Start Date	2/28/2013
Proposed End Date	7/6/2018
Project Scope	The scope of work for the project will be to design, entitle, implement, maintain, and monitor the proposed Bank project
Project Description	The Bank project would create a mitigation and conservation bank that would yield approximately 120 riparian floodplain and endangered species conservation credits, and has the potential to create approximately 21,000 linear feet of restored and enhanced shaded riverine aquatic (SRA)/channel margin habitat available as mitigation credits on a per-linear foot basis. The Bank would be partially utilized by WSAFCA to fulfill mitigation that will be obligated to the Southport EIP project, but will have substantial remaining credits for use by the State for future project impacts resulting from implementation of the Central Valley Flood Protection Plan (CVFPP). The Southport EIP project reach extends approximately 5.6 miles from the termination of the USACE Sacramento River Bank Protection Project at River Mile 57.2R south to the South Cross Levee (Figure 1). The Southport EIP project will be constructed using a combination of methods to create a system of new levees or reinforced existing levees. Portions of the new levee segments will be constructed 400' to 1000' away from the Sacramento River channel to create a setback area. The Bank will be

	developed in the setback area for approximately four miles along the Sacramento River (Figures 2 and 3). The setback area will be excavated down to an elevation of between +7.0' and +10.0' NAVD88 and the excavated material will be utilized in constructing portions of the new flood control features. A low-flow swale will be excavated within the restored floodplain at approximately +7.0' NAVD88 to provide access to the vegetated floodplain terrace and a drainage point back to the main river channel to minimize the potential for fish stranding during flood water recession. The existing Sacramento River levee will be degraded and breached in places in order to create full hydrologic connectivity between the setback area and the main river channel.
Project Objective	

Project Benefits Information

Project Objective

Budget

Other Contribution	0
Local Contribution	0
Federal Contribution	0
Inkind Contribution	0
Amount Requested	5000000
Total Project Cost	5000000

Geographic Information

Latitude DD(+/-)	38	MM 31	SS 52
Longitude DD(+/-)	121	MM 31	SS 54

Longitude/Latitude Clarification Location

County Yolo Ground Water Basin Sacramento Valley-Yolo Hydrologic Region Sacramento River WaterShed

Legislative Information

Assembly District	4th Assembly District
Senate District	3rd Senate District
US Congressional District	District 5 (CA)

Section : General Project Information

This section contains seventeen general questions about the proposal that all applicants are required to answer.

G1 - Applicant Contact Information

Provide contact information (name, organization, address, phone number, and e-mail address) for the individual who would be the primary contact regarding the grant proposal.

If the Project Lead organization is a local government, nonprofit, or consortium, attach a resolution from the appropriate applicant organization authorizing the Applicant to sign a funding agreement on its behalf.

West Sacramento Area Flood Control Agency 1110 West Capital Avenue, West Sacramento, CA 95691 Attn: Kenneth Ruzich Title: General Manager Telephone: 916-606-6435 email address: wsrd@pacbell.net

G2 - Key Cooperators

Provide contact information (name, organization, address, phone number, and e-mail address) for any (sub)contractors, advisors, or other technical personnel identified as being necessary for successful completion of the project ("Key Cooperators").

Attach a resume for each person identified as a "Key Cooperator".

Carl Jensen ICF International 630 K Street Suite 400 Sacramento, CA 95814 Telephone: 916-231-7668 email address: carl.jensen@icfi.com Derek Larsen MBK Engineers 1771 Tribute Way, Suite A Sacramento, CA 95815 Telephone: 916-456-4400 email address: larsen@mbkengineers.com Chris Bowles cbec ecoengineering 2544 Industrial Blvd West Sacramento, CA 95691 Telephone: 916-231-6052 email address: c.bowles@cbecoeng.com

G3 - Project Title

Give your project a short title.

State of California West Sacramento Floodplain Mitigation Bank

G4 - Project Location

List all the counties and/or cities in which project activities would occur under this proposal.

In addition, list all river systems, and approximate locations (in river miles, if applicable), on which project activities would occur under this proposal.

City of West Sacramento, Yolo County Sacramento River Miles 52.8 to 57.2

G5 - Current Zoning and Land Use

Describe the current zoning and land use for the parcel(s) that are the subject of this proposal.

If there is a likelihood of zoning or general plan changes for the property in the next year (e.g., a General Plan update is in process, or a zoning code amendment is or will soon be proposed), provide a brief explanation of the expected changes.

The land use in the proposed mitigation reserve is currently identified for future urban development in the City of West Sacramento General Plan. The zoning varies depending on location from low, medium, and high density residential, water front development, public open space, and recreation.

G6 - Description of Parcel(s)

Give the size of the property (in acres) that is the subject of this proposal, and briefly describe the natural resources on the property currently.

In addition, identify the approximate size (in acres and/or linear feet) of the project's footprint on the property.

Provide information about any surveys that have been conducted on the property, including biological, archaeological, pipeline/transmission, topographical, etc.

The project footprint is approximately 120 acres. The following surveys and studies have been completed to date: 1. Baseline topographic surveys; existing utility surveys and mapping; bathymetric surveys; hydraulic data development including Acoustic Doppler Current Profile (ADCP flow and velocity) measurements and river stages for model calibration purposes; geomorphic data development including suspended and bedload sediment transport measurements; and erosion assessments along the river bank of the Sacramento River through the project reach. 2. Extensive geotechnical investigations, including numerous boreholes and soils tests in the setback area and existing levee, to characterize geologic conditions including underseepage issues. 3. Assessment of biological and ecological conditions along the riverbank and setback area, including identification of sensitive species. 4. Hydrodynamic and sediment transport modeling to identify system-wide and localized impacts of levee setback alternatives, and potential mitigation options. 5. Property surveys and investigations. 6. Optimization of setback grading to provide material for levee construction and identification of additional borrow material sites. 7. Development of preliminary erosion control measures for the setback area, the new Southport EIP levee, and the remnant riverbank of the Sacramento River, including biotechnical bank stabilization measures. 8. Development of 65% design level plans, specifications and cost opinions for the Southport EIP. 9. Preparation of the Southport EIP draft EIS/EIR for public review and preliminary regulatory permitting applications.

G7 - Landowner(s)

Identify all recorded legal rights on the property, including but not limited to ownership titles, easements, liens or other encumbrances for the property that is the subject of this proposal.

Land will be purchased as part of the Early Implementation Project being advanced by WSAFCA in partnership with the State of California. For purposes of this project it can be assumed that the property for the mitigation bank will be held by WSAFCA of the Sacramento-San Joaquin Drainage District prior to initiation of the project.

G8 - Holder(s) of Water and Mineral Rights, and Rights of Way

Rights of Way (ROWs) and possible implications for land management.

To verify that any water rights necessary to implement the project have been obtained, indicate the basis and source of those rights.

Not applicable

G9 - Landowner(s) Willingness to Participate

If the property is in private ownership, is there a legally binding agreement with the landowner that would allow habitat to be developed and sustained into perpetuity on the parcel? If so, attach a copy of the agreement.

Also, if the property is in private ownership, is there an agreement with or written authorization from the owner that DWR or its multi-agency group can visit the site for reconnaissance level visits? If so, attach a copy of the agreement/authorization.

Not applicable

G10 - Project Description

Describe your project and explain how it will advance the goals of ecological enhancement while providing mitigation for future work at State Plan of Flood Control (SPFC) facilities.

Attach a detailed description of the project and clearly indicate which portions are proposed for DWR's bond funding. The project description should include, at a minimum:

- **the goals and objectives of the project;**
- **the activities that will be undertaken under this proposal to achieve the project objectives;**
- **relationships to other projects or activities that may benefit from implementation of this project, as well as any existing mitigation obligations of these projects or activities, if known;**
- **the approximate timelines for deliverables associated with this proposal; and**
- **a brief description, including approximate timelines and expected deliverables, of any future phases that would result in full implementation of the project, if applicable.**

Refer to the Work Plan, Budget, & Schedule: Grantee Guidance document.

Attach a Scope of Work – Task Outline describing the work to be performed for each task, as well as the deliverables (see Table 1).

Attach a Schedule (see Table 4).

Attach location maps, designs, color photographs, or other information that describes the project.

The State of California West Sacramento Floodplain Restoration Bank (Bank) is the final phase of the Southport Early Implementation Project (EIP) (Southport EIP), which is a proposed multi-objective flood control project for the City of West Sacramento that advances the primary goals of achieving a minimum level of 200-year flood protection, providing flood-compatible recreational opportunities, and habitat restoration when economically feasible. The Bank project would create a mitigation and conservation bank that would yield approximately 120 riparian floodplain and endangered species conservation credits, and has the potential to create approximately 21,000 linear feet of restored and enhanced shaded riverine aquatic (SRA)/channel margin habitat available as mitigation credits on a per-linear foot basis. The Bank would be partially utilized by WSAFCA to fulfill mitigation that will be obligated to the Southport EIP project, but will have substantial remaining credits for use by the State for future project impacts resulting from implementation of the Central Valley Flood Protection Plan (CVFPP). The Southport EIP project reach extends approximately 5.6 miles from the termination of the USACE Sacramento River Bank Protection

Project at River Mile 57.2R south to the South Cross Levee (Figure 1). The Southport EIP project will be constructed using a combination of construction techniques to create a system of new levees or reinforced existing levees. Portions of the new levee segments will be constructed 400? to 1000? away from the Sacramento River channel to create a setback area. The Bank will be developed in the setback area for approximately four miles along the Sacramento River (Figures 2 and 3). The setback area will be excavated down to an elevation of between +7.0? and +10.0? NAVD88 and the excavated material will be utilized in constructing portions of the new flood control features. A low-flow swale will be excavated within the restored floodplain at approximately +7.0? NAVD88 to provide access to the vegetated floodplain terrace and a drainage point back to the main river channel to minimize the potential for fish stranding during flood water recession. The existing Sacramento River levee will be degraded to a lower elevation or completely breached in places in order to create full hydrologic connectivity between the setback area and the main river channel. The restoration objectives developed for the Bank include provide compensatory mitigation credits for impacts to protected land cover types and to special-status species and potential habitat for these species; restoring portions of the historic Sacramento River floodplain (i.e., waters of the United States); restoring riparian and oak woodland habitat on the restored floodplain that will create continuous habitat corridors for wildlife movement; designing habitat features to minimize future maintenance obligations (e.g., reduce opportunities for sediment and debris accumulation); and designing floodplain planting and vegetation management schemes to avoid undesirable hydraulic and sediment transport impacts to the setback levee and offset area.

G11 - Habitat Connectivity

If the property is located near any protected habitat areas or high-quality habitat types, describe these areas/habitat types and indicate their proximity (in linear miles) to the project site.

Attach map(s) showing the location of nearby habitat and conserved areas.

The project site is surrounded by developed areas of single-family residences, active and fallow agricultural lands, and the Sacramento River. The proximity of the project site to the Sacramento River and length of frontage along the river channel provides an excellent opportunity to restore a portion of the historic Sacramento River floodplain and recreate some of the historic functions and values that were lost when the river was channelized. Existing riparian habitat in the project area and immediate vicinity consists of a narrow, discontinuous band on the water side of the Sacramento River levee. This riparian strip provides limited shaded riverine aquatic (SRA) habitat. Large areas of cultivated and fallow agricultural land occur directly adjacent to the project area. These areas could provide foraging habitat for raptors including Swainson's hawk.

G12 - Benefits to Sensitive Habitats and/or Species

Describe any benefits that are expected to accrue to fish, wildlife, or plant species listed as threatened, endangered, of special concern, or otherwise protected by law, as well as any benefits to sensitive habitats on which these species depend, as a result of this project.

Indicate the specific amounts of mitigation/compensation areas (if known) that would result from implementation of this project and could be applied to future work at State Plan of Flood Control facilities.

The proposed project will create riparian floodplain and off-channel refugia habitat for native fish, including Chinook salmon (Oncorhynchus tshawytscha) and Sacramento splittail (Pogonichthys macrolepidotus), and to a limited extent Central Valley steelhead (Oncorhyncus mykiss). Floodplains are now recognized as major contributors to aquatic production and species diversity in large river systems where native fish species have evolved specific adaptations to exploit these

variable but highly productive habitats. Floodplains can greatly expand the quantity and quality of habitat available to juvenile salmon, splittail and other fishes during seasonal inundation periods. After young salmon have dispersed from spawning areas, the distribution and abundance of young salmon is determined largely by their preferences for shallow water and low water velocities, which in large rivers are found mostly along channel margins, floodplains, and other off-channel habitats. Floodplain habitat is extremely limited along the Lower Sacramento River. It is generally assumed that the number or biomass of fish and other organisms that can be supported by a habitat is directly proportional to the area of suitable habitat. Larger floodplains may also enhance growth and survival of rearing juveniles by increasing the amount of living space, reducing competition for food, and reducing potential encounters with predators. Floodplain area may also affect the productivity of river-floodplain systems by affecting hydraulic residence time, water temperature, and inputs of organic matter, plankton, and invertebrates from the floodplain into river channels (Ahearn et al. 2006). Floodplains can greatly expand tbe quantity and quality of habitat available to juvenile salmon, splittail and other fishes during seasonal inundation periods. After young salmon have dispersed from spawning areas, the distribution and abundance of young salmon is determined largely by their preferences for shallow water and low water velocities, which in large rivers are found mostly along channel margins, floodplains, and other off-channel habitats (Beechie et al. 2005, Lestelle et al. 2005). The Swainson?s hawk is a state-listed threatened species. Swainson?s hawks are summer residents in the study area. The nesting season extends from approximately early March through August. In the Central Valley, Swainson?s hawks nest occur primarily in riparian areas adjacent to agricultural fields or pastures, although isolated trees or roadside trees are sometimes used (California Department of Fish and Game 1994). Swainson?s hawks nest in mature trees; the preferred tree species are valley oak, cottonwood, willows, sycamores, and walnuts. Nest sites typically are located in the vicinity of suitable foraging areas. The primary foraging areas for Swainson?s hawk are open agricultural and pasture lands (California Department of Fish and Game 1994).

G13 - Project Support and/or Opposition

Describe the outreach that has been conducted to date for this project.

Characterize the level of support for this project among nearby landowners and local interests, entities, and organizations.

Describe any known opposition to the project.

WSAFCA has taken a proactive, transparent approach throughout all stages of the Southport Sacramento River Early Implementation Project. WSAFCA has kept the West Sacramento community informed about their role to ensure the community at large is safe from flooding. The agency simultaneously stresses their commitment to ensure the least damage to private property owners as possible as part of the levee improvement project. Private property owners and at-large residents alike have received updates throughout the process and at key project milestones through public meetings, small group meetings, one-on-one meetings, media relations, mailers, utility bill inserts, community presentations and additional outreach channels. Many community members have expressed their support of the project as a result of the outreach to nearby property owners, stakeholders, community members and the public. Organizations including the West Sacramento Chamber of Commerce, community leaders and business owners have endorsed and supported the project, citing the need for levee improvements in the south area of the city and city-wide. While the most impacted property owners expressed their desire for a different project alternative, many have also expressed appreciation for the transparent process WSAFCA has employed since the beginning. By the end of preliminary design, the property owner representative?s attorney said she had ?never worked with a public agency more committed to working with residents than West

Sacramento.? Her comments were a result of the significant number of public meetings, community meetings and one-on-one meetings. Several homes slated to be removed have been saved due to property owner outreach and continual dialog between the owners, WSAFCA and the project?s design team. Some of the property owners who formerly opposed the project are now working with WSAFCA on new transportation alternatives and seem to be working productively with staff on solutions. Formal public comment will be secured and considered through the NEPA/CEQA process and some affected property owners will likely oppose the extent of setback levee currently identified in the preferred project alternative. WSAFCA has received letters of opposition from some of the affected property owners related to the extent of setback currently identified in the preferred project alternative. Overall WSAFCA believes that there is general support from the community for the project.

G14 - Status of Permits and Documents

Briefly describe the permits and environmental document that will be applicable to your project, and the status of obtaining those permits and preparing those documents.

Include information about possible permitting obstacles for getting the project implemented such that it provides advancem itigation for future work at SPFC facilities (this could include conflict with an existing easement or revocability of existing permits).

Implementing the Bank project will require compliance with several local, state, and federal regulatory processes. The following is a list of the anticipated approvals that will be needed: CEQA/NEPA Compliance Clean Water Act Section 404 Compliance (Section 404) Federal Endangered Species Act (Section 7) National Historic Preservation Act Section 106 Documentation Fish and Wildlife Coordination Act Support California Endangered Species Act (Section 2081) California State Fish and Game Code (Section 1602) Clean Water Act Section 402 Compliance Clean Water Act Section 401 Compliance Central Valley Flood Protection Board (CVFPB) Encroachment Permit (Title 23) Yolo County Grading Permit For the purposes of this submittal it has been assumed that all regulatory approvals would be obtained seperate from those required for the Southport EIP. If bond funding could be secured in early 2013, many efficiecies in the permitting process could be realized by including the Bank project in the Southport EIP regualtory permit applications.

G15 - Funding Requested

Refer to the Work Plan, Budget, & Schedule: Grantee Guidance document.

Attach a Task Budget (see Table 2). Indicate within the budget sheet how much bond money is being requested from DWR, and how much money or in-kind service is being provided by the Applicant, Key Cooperators, and other partnering entities. (If in-kind services or resources are being provided, estimate their monetary value.)

Last Uploaded Attachments: FESSRO Budget.pdf

G16 - Estimates of Costs for Future Phases

Refer to the Work Plan, Budget, & Schedule: Grantee Guidance document.

If this project is anticipated to have subsequent phases, attach a Task Budget (see Table 2) and indicate within the table the needs (activities and deliverables) and approximate costs of the future phases needed for the project to be fully implemented in the future.

(If this project does not include future phases, indicate this as your response and proceed to Question G17.)

Last Uploaded Attachments: NA.pdf

G17 - Management and Maintenance Responsibilities

Identify who will be responsible for management and maintenance of the constructed project during the establishment phase, and identify who will be responsible for long-term management and maintenance.

Identify the amount of endowment that will be used to fund the long-term management of the project, and the source of those funds.

If the proposal is for a mitigation bank for which the applicant entity will be responsible for all management and maintenance, as well as the endowment, indicate that in your response and identify the amount of the endowment.

As a flood risk reduction agency, WSAFCA has limited financial and political ability for habitat restoration beyond that required for project mitigation associated with the Southport EIP. WSAFCA will partner with the State to identify responsible parties for land ownership, bank ownership, and operations and maintenance, given that the majority of the mitigation credits will be utilized by the State. Further, WSAFCA and the State will need to work closely together on the financial details of the project to ensure that the interests of both agencies are met.

Section : Advance Mitigation ("IRT" and/or "Other Mechanisms")

DWR is interested in creating mitigation banks with regulatory agencies participating on the Interagency Review Team (IRT) as the signatories, and to provide advance mitigation credits for sensitive habitats and species that are expected to be impacted by future SPFC projects, including but not limited to:

- Riparian forest and shrub-scrub (e.g., mitigation for implementation of Life Cycle Management)
  - Shaded riverine aquatic (SRA) areas
  - Channel margin and floodplain areas
- Salmon and steelhead; green sturgeon (mitigation for impacts to habitat from alterations to SPFC facilities)

Please refer to Table 1 of the PSP for the list of species and natural communities targeted by this PSP.

If your proposal is to create a mitigation bank in accordance with the existing Interagency Review Team (IRT) mitigation banking process, answer questions AM1 through AM4. If your proposal is to formulate "umbrella" banking instruments or other mechanisms, answer questions AM5 through AM7.

AM1 - Land Control (privately-owned lands)

Describe whether acquisition from willing sellers of private lands will be through fee title or conservation easement.

- **If acquisition will be through fee title, note that and proceed to the next question (AM2).**
- **If acquisition will be through conservation easement, provide an answer (Yes/No) to the following three questions:**
  - **Is there a legally binding agreement with the landowner that would allow habitat to be developed on the parcel?**
  - **Is the conservation easement already recorded?**
  - **Is the conservation easement under development? (If Yes, explain the status of the recording of the conservation easement and provide an expected timeline.)**

Acquisition of land for the Southport EIP and Bank projects will be done through fee title.

AM2 - IRT Mitigation Banking Enabling Instrument Checklist

Completion of specific activities (refer to the Mitigation Banking Enabling Instrument checklist currently utilized by the Interagency Review Team (IRT), provided as Attachment B1 to the PSP on the website) is currently required by regulatory agencies for the establishment of a mitigation or conservation bank.

For this PSP, DWR is soliciting proposals that will serve as 'advance mitigation' for SPFC facilities' evaluation, repair, reconstruction, or replacement projects; therefore, habitat and/or species credits at the bank site may be determined at a later date in light of future permit needs of the individual facilities (a situation sometimes referred to as a "turn-key" or "single-user" mitigation bank.)

Describe which specific component(s) of these IRT requirements are being proposed as part of this project.

All componenets of the IRT bank enabling instrument checklist will be prepared or secured as part of this project. This will include: 1. BEI 2. Location maps 3. Service area maps and description 4. Development plan 5. Bank management and operation documents 6. Real estate records and assurances 7. Bank crediting and credit transfers 8. Phase 1 Environmental Site Assessment 9. Biological resources survey 10. Wetland delienation verification letter 11. Cultural, historical, archaeological and Native American resources information 12. Other documents and permits

AM3 - Land Improvement (State or federal lands)

If the proposal is to establish a bank site on real property that is already under the control of a State or federal agency, describe which specific component(s) of the IRT requirements are being proposed as part of this project (refer to the Mitigation Banking Enabling Instrument checklist provided as Attachment B1to the PSP on the website).

not applicable

AM4 - DFG Mitigation Policy on Publicly Owned and Conserved Lands

If the proposal is to establish a bank site on real property that is already under the control of a State or federal agency and/or was acquired for conservation purposes, and if the California Department of Fish and Game (DFG) is one of the regulatory agencies that would be a signatory for the development and use of mitigation credits, please check the box to indicate that you have read and understand DFG's new policy for mitigation on publicly owned and conserved lands (included as Attachment B2 to the PSP on the website).

AM5 - Umbrella Bank Development

Indicate whether you would like your proposal to be considered for inclusion under one or more umbrella mitigation banking instruments by listing any and all species (refer to Table 1) or vegetation communities (riparian forest and shrub scrub, shaded riverine aquatic, and/or channel margin and floodplain) that would benefit from your project. ***Note that funding for such a project or activity will be contingent upon approval by the relevant regulatory agencies that the project meets the mitigation requirements for inclusion in an umbrella mitigation bank in the future, including but not limited to long-term management and funding assurances.***

not applicable

AM6 - DFG Mitigation Policy on Publicly Owned and Conserved Lands

If you answered Question AM5 (Umbrella Bank Development) and your proposal is to establish an umbrella bank site on real property that is already under the control of a State or federal agency and/or was acquired for conservation purposes, and if the California Department of Fish and Game (DFG) is one of the regulatory agencies that would be a signatory for the development and use of mitigation credits, please check the box to indicate that you have read and understand DFG's new policy for mitigation on publicly owned and conserved lands (included as Attachment B2 to the PSP on the website).

a) ☑ I have read and understand the DFG policy.

AM7 - Other Proposed Mitigation Mechanisms

If Applicants feel they cannot or may not need to meet IRT requirements described in Attachment B1, they are encouraged to identify potential alternatives that can provide equivalent information for consideration by applicable regulatory agencies outside of the IRT process. Describe those alternatives here. ***Note that funding for such a project or activity will be contingent upon the relevant regulatory agencies' approval of these alternatives as functionally equivalent to the information required by the IRT, such that they can formally become a signatory for the development and use of mitigation credits in permit negotiations on SPFC projects.***

not applicable

Section : Additional Application Questions

This tab includes additional questions that the PET will use to evaluate your proposal.

Q1 - Significant Impacts under CEQA

List any potentially significant impacts the proposed project could result in. If available, list mitigation measures that have been incorporated into the proposal.

There may be significant impacts regarding air quality and sensitive biological resources. For air quality impacts, mitigation measures to reduce emissions from construction equipment and a fugitive dust control plan may be required. For impacts to sensitive biological resources, construction work windows, pre-construction clearance surveys, exclusion devices, and biological monitoring during project implementation may be required.

Q2 - List of required permits

List the required permits and provide an implementation plan for their procurement.

The following is a list of the anticipated regulatory permits and approvals needed for implementation of the Bank project: CEQA/NEPA Compliance Clean Water Act Section 404 Compliance (Section 404) Federal Endangered Species Act (Section 7) National Historic Preservation Act Section 106 Documentation Fish and Wildlife Coordination Act Support California Endangered Species Act (Section 2081) California State Fish and Game Code (Section 1602) Clean Water Act Section 402 Compliance Clean Water Act Section 401 Compliance Central Valley Flood Protection Board (CVFPB) Encroachment Permit (Title 23) Yolo County Grading Permit WSAFCA will establish communication, in coordination with DWR or its designee, with the resource and regulatory entities. The purpose of communication at this stage is to ensure that regulatory triggers and approval pathways are identified early, a spirit of cooperation is established, and agency feedback is integrated into the project design to facilitate a smooth process and fair outcome for WSAFCA relative to permit conditions. It is intended that communication at this stage will be informal and preparatory for formal pre-application meetings. The communication will focus on agency preferences for analytical methods and documentation standards, with the overall intent of establishing constructive rapport for the project and WSAFCA, as well as determining pathways among variable permit parameters (such as for Clean Water Act [CWA] Section 404). WSAFCA will apply the information and agency communication to develop a permitting strategy, detailed workplan, and schedule. The workplan and schedule will prioritize the permits as individual tasks based on duration of document preparation time, elements common and essential to multiple permit applications, agency processing time, design milestones, and additional data needs, reflecting the dependencies between permits. This task will also include coordination with the design and modeling consultant as well as the lead for the CEQA document. WSAFCA will provide feedback on the design and CEQA document relative to likely permit conditions and to ensure avoidance and minimization of environmental effects or permitting challenges. Finally, this task will include a cultural resources record search from the county information center and a search of the California Native Diversity Database for special-status species.

Q3 - Property Acquired or Restored used for Mitigation

Will any of the property acquired or restored with this grant funding be used to meet mitigation requirements for another project? (Yes or No)

If yes, please indicate the number of acres and the specific project(s) for which the property to be acquired or restored would provide mitigation.

Yes, it is anticipated that between 20 and 30 of the credits from the Bank project will be assigned to the Southport EIP as project mitigation.

Q4 - Project Acquisition and Easement Description

Provide a description of how the property improvements or acquired property interests funded by the grant will be conserved in perpetuity, either by a recorded conservation easement, deed restriction or similar limitation to fee title held and enforced by an unidentified third party, or other mechanism acceptable to the State. Upon project implementation, it must be in first position ahead of any recorded mortgage or lien on the property unless this requirement is waived by the State.

The Bank project site will be located in a California state designated floodway which will restrict future activities on the site. As a flood risk reduction agency, WSAFCA has limited financial and political ability for habitat restoration beyond that required for project mitigation associated with the Southport EIP. WSAFCA will partner with the State to identify responsible parties for land ownership, bank ownership, and operations and maintenance, given that the majority of the mitigation credits will be utilized by the State. Further, WSAFCA and the State will need to work closely together on the financial details of the project to ensure that the interests of both agencies are met.

Section : Attachments

The following items will be uploaded onto the application as attachments. All attachments must be kept under the 50MB maximum allowed on the BMS/GRanTS, so it may be necessary for applicants to submit the attachments as separate files (up to five files may be uploaded per question, or to zip them, prior to uploading. Also, BMS/GRanTS requires the file name to be less than 50 characters in length.

Attachment 1 - Signature Page

Download the Signature Page from DWR's CVFS Conservation Framework and Strategy website. Upload a scanned version onto the BMS/GRanTS and send by mail, delivery service, or hand carry an original (wet signature) signed form with hard copy of the proposal to the physical address noted in your invitation letter.

Last Uploaded Attachments: Signature Page.pdf

Attachment 2 (see Question G1) - Resolution

Download the resolution from DWR's CVFS Conservation Framework and Strategy website. Attach a resolution from the applicant organization's governing board authorizing submittal of a grant application, indicating their intent to accept the grant if awarded, and authorizing specific individuals to sign the funding agreement on behalf of each applicant organization.

Last Uploaded Attachments: Signed Res. 12-12-01.pdf

Attachment 3 (see Question G2) - Resumes for Key Cooperators

Provide a resume (up to 2 pages) for each identified Key Cooperator.

Last Uploaded Attachments: Carl Jensen resume.pdf,Derek Larsen resume.pdf,Chris Bowles resume.pdf

Attachment 4 (see Question G9) - Landowner Agreements

If applicable, attach (1) a copy of any agreement authorizing creation of habitat on a private parcel; and (2) written authorization to access the project site for reconnaissance purposes.

Last Uploaded Attachments: NA.pdf

Attachment 5 (see Question G10) - Project Description; Scope of Work; Schedule

Attach a detailed description of the project and clearly indicate which portions are proposed for DWR's bond funding. The project description should include, at a minimum:

- **the goals and objectives of the project;**
- **the activities that will be undertaken under this proposal to achieve the project objectives;**
- **relationships to other projects or activities that may benefit from implementation of this project, as well as any existing mitigation obligations of these projects or activities, if known;**
- **the approximate timelines for deliverables associated with this proposal; and**
- **a brief description, including approximate timelines and expected deliverables, of any future phases that would result in full implementation of the project, if applicable.**

Scope of Work-Task Outline - Refer to the document *Work Plan, Budget, & Schedule: Grantee Guidance* from DWR's CVFS Conservation Framework and Strategy website. Use the example provided (Table 1) to create a Scope of Work – Task Outline, and upload it to BMS.

Schedule – Refer to the document *Work Plan, Budget, & Schedule: Grantee Guidance* from DWR's CVFS Conservation Framework and Strategy website. Use the example provided (Table 4) to create a Schedule, and upload it to BMS.

Last Uploaded Attachments: Southport FESSRO Final Proposal Scope.pdf

Attachment 6 (see Questions G10 and G11) - Project Drawings and Sketches; Maps

Project Drawings and Sketches – Provide location maps, designs, drawings, color photographs, or other information that describes the project features.

Project Location/Site/Vicinity Map – Provide a map and/or diagrams depicting locations of nearby conservation properties and projects in relation to the project site.

Last Uploaded Attachments: Figures 1-3.pdf

Attachment 7 (see Question G15) - Task Budget

Refer to the document *Work Plan, Budget, & Schedule: Grantee Guidance* from DWR's CVFS Conservation Framework and Strategy website. Use the example provided (Table 2) to create a Task Budget that reflects the contents of the Scope of Work-Task Outline submitted in Attachment 5, and upload it to BMS. Make sure the task budget includes all costs for developing agreements with regulatory agencies, and long-term maintenance costs for the site as well as flood maintenance costs.

Last Uploaded Attachments: FESSRO Budget.pdf

Attachment 8 (see Question G16) - Task Budget for Potential Future Phases

Refer to the document *Work Plan, Budget, & Schedule: Grantee Guidance* from DWR's CVFS Conservation Framework and Strategy website. <u>If applicable to your project</u>, use the example provided (Table 2) to create a Task Budget reflecting expected costs of future phases that will need to occur to bring this project to completion.

Last Uploaded Attachments: NA.pdf

West Sacramento Area Flood Control Agency (WSAFCA)

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pauld@cityofwestsacramento.org

January 7, 2013

Submittal to:
Lori Clamurro Chew
Department of Water Resources
FloodSAFE Environmental Stewardship and Statewide Resources Office
901 P Street, Room 411A
Sacramento, California 95814

Submittal includes:

- 2 copies of the West Sacramento Area Flood Control Agency's State of California West Sacramento Floodplain Mitigation Bank Work Plan, Schedule, and Budget

California Department of Water Resources
Central Valley Flood System Conservation Framework and Strategy
Grant Application Form
November 2012

Applicant Signature Page

Applicant: West Sacramento Area Flood Control Agency

Project Title: State of California West Sacramento Floodplain Mitigation Bank

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

The individual signing the form has the legal authority to submit the proposal on behalf of the applicant, and the applicant has the legal authority to enter into a contract with the State;

There is no pending litigation that may impact the financial condition of the applicant or its ability to complete the proposed project;

The individual signing the form waives any and all rights to privacy and confidentiality of the proposal; [Note: DWR will keep confidential sensitive information related to property negotiations or legal proceedings to the extent allowed under public information disclosure laws.]

The applicant will comply with all terms and conditions identified in the Central Valley Flood System Conservation Framework and Strategy Guidelines, PSP, and future Funding Agreement if selected for funding.

Kenneth A. Ruzich, General Manager
West Sacramento Area Flood Control Agency

1/7/13
Date

STATE OF CALIFORNIA WEST SACRAMENTO

FLOODPLAIN MITIGATION BANK

WORK PLAN, SCHEDULE, AND BUDGET

Submitted By:

West Sacramento Area Flood Control Agency

Submitted On:

January 7, 2013

Prepared by:

MBK ENGINEERS
CONSULTING ENGINEERS

ICF INTERNATIONAL

cbec

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PROJECT INFORMATION

The State of California West Sacramento Floodplain Restoration Bank (Bank) project would create a mitigation and conservation bank that would yield approximately 120 riparian floodplain and endangered species conservation credits, and has the potential to create approximately 21,000 linear feet of restored and enhanced shaded riverine aquatic (SRA)/channel margin habitat available as mitigation credits on a per-linear foot basis. Specifically, the proposed Bank project would create riparian floodplain and off-channel refugia habitat for native fish, including Chinook salmon and Sacramento splittail, and to a limited extent, Central Valley steelhead. The West Sacramento Area Flood Control Agency (WSAFCA) would partially utilize the Bank to fulfill mitigation that will be obligated to the Southport Early Implementation Project (Southport EIP), but substantial credits will remain for use by the State to mitigate for future project impacts resulting from implementation of the Central Valley Flood Protection Plan (CVFPP).

Southport Early Implementation Project (Southport EIP)

The Bank project represents the final phase of the Southport EIP, which is a proposed multi-objective flood control project for the City of West Sacramento that advances the primary goal of achieving a minimum level of 200-year flood protection and when compatible providing recreational opportunities, and restoring habitat and floodplain values when economically feasible. The Southport EIP reach extends approximately 5.6 miles from the termination of the U.S. Army Corps of Engineers' (USACE's) Sacramento River Bank Protection Project at River Mile 57.2 south to the South Cross Levee (Figure 1). While the Southport EIP is still undergoing environmental and public review pursuant to NEPA and CEQA, the currently identified preferred alternative would create a new setback levee and reinforce existing levees. The new levee segment would be constructed between 400 and 1,000 feet away from the Sacramento River channel to create a new setback floodplain area.

A setback levee has a number of extended floodplain management benefits, including a reduction in operations and maintenance (O&M) for levees and capital costs to mitigate for erosion. Additionally, a fully engineered levee section will better withstand seismic events, further reducing O&M and future capital investments. An important threshold criterion for all flood risk reduction projects is ensuring that no significant adverse system-wide hydraulic impacts result from a project. WSAFCA has performed extensive hydraulic and geomorphic modeling of the proposed setback levee and the results to date indicate that the levee improvements, including restoration of the setback area, would not result in significant adverse hydraulic impacts. Accordingly, WSAFCA is proposing the Bank project to improve floodplain values and recreation opportunities while maintaining a sustainable flood risk reduction system.

West Sacramento Floodplain Mitigation Bank (Bank Project)

The Bank project would be developed in the setback area of the Southport EIP. It would extend approximately four miles along the Sacramento River and vary in width between 400 and 1,000 feet (Figures 2 and 3). Design of the Bank project in the setback area would be initiated once the Southport EIP 65% design and the public review period for the EIS/EIR are underway, which is expected in early 2013. Based on designs for the Southport EIP, which are currently being finalized, it is anticipated that much of the setback area would be excavated down to a floodplain elevation of approximately 10.0' NAVD88 and the excavated material would be

utilized in constructing portions of the new flood control features. A low-flow swale would be excavated within the restored floodplain with an invert elevation at approximately +7.0' NAVD88 to provide access to the vegetated floodplain terrace and a drainage point back to the main river channel, which would minimize the potential for fish stranding during flood water recession. The existing Sacramento River levee would be excavated to a lower elevation or completely breached in places to create effective hydrologic connectivity between the restored floodplain and the main river channel.

Seasonal inundation of the floodplain, including restored riparian, woodland, and grassland habitats, would provide seasonal rearing habitat for juvenile salmonids. After young salmon have dispersed from spawning areas, their distribution and abundance is determined largely by their preferences for shallow water and low water velocities, which in large rivers are found mostly along channel margins, floodplains, and other off-channel habitats. Based on a habitat suitability index (HSI) developed for juvenile salmonids by ICF International, the restored floodplain is likely to provide optimal or near-optimal rearing habitat for juvenile salmonids. Floodplain and riparian habitat inundation may also benefit other native fishes, including Sacramento splittail and steelhead trout.

Existing SRA habitat/channel margin in the Southport EIP project area is limited to a narrow, discontinuous band of riparian vegetation on the Sacramento River levee and at isolated locations in the levee setback area. The primary area for restoring SRA/channel margin habitat would be focused along the existing riverbank of the Sacramento River. The existing levee is positioned along the top of the riverbank. Implementation of the Southport EIP would set back the new levee and the existing levee would be partially or entirely degraded along the riverbank. Removing the existing levee from the riverbank will allow substantial lengths of channel margin to be enhanced with riparian vegetation, slope flattening, and in-stream habitat structures. Riparian scrub and cottonwood forest habitat may be established on portions of the restored and/or lowered floodplain relatively close to the Sacramento River and would be subject to recurrent inundation. Riparian shrub habitat would include several willow species, buttonbush, and seedlings of other native riparian species. Cottonwood forest habitat would be subject to recurrent flooding and would include an overstory of cottonwood, sycamore, willow, box elder and Oregon ash. Understory riparian species such as California grape and California blackberry would be included in both planting palettes to provide diversity in vegetative structure. Elderberry shrubs may be included in the restoration design if they would not conflict with managing the flood control features. Current project designs call for sections of the existing levee to be stabilized with biotechnical treatments to minimize bank erosion in critical areas. These erosion treatments be modified with additional plantings and habitat structures such as root wads or engineered log jams to maximize benefits to aquatic species.

Between the riverbank and the new setback levee alignment, a system of swales will be designed that will form the primary riparian and aquatic habitat corridors and provide floodplain drainage of the setback area. Substantial aquatic-to-terrestrial transition "edge" habitat would be created along these swales. In addition, topographic heterogeneity will be incorporated into the project design grading plans that will allow for a mosaic of seasonal wetland, riparian wetland, and riparian upland habitats. Seasonal wetland areas will be enhanced with wetland vegetation, while riparian upland habitats will include a variety of willow-scrub, cottonwood forest, and oak woodland plantings.

Finally, other enhancements may be incorporated, such as the inclusion of large woody material (root wads/engineered log jams) to provide for additional flow diversity and habitat refugia valuable for aquatic habitats in the setback area.

Ultimately, its anticipated that implementation of the Bank Project could yield up to approximately 120 riparian floodplain and endangered species conservation credits and approximately 21,000 linear feet of restored and enhanced SRA/channel margin habitat available as mitigation credits on a per-linear foot basis. WSAFCA would partially utilize these credits to fulfill mitigation obligations resulting from the Southport EIP, but substantial credits would remain available.

A Bank Enabling Agreement (BEI) will be prepared for the Bank project and will serve as the agreement between the bank sponsor and the appropriate natural resource agencies "regarding the establishment, use, operation, and maintenance of the Bank" to compensate for unavoidable impacts on, and conserve and protect, waters of the U.S., endangered species, and other protected habitat.

Commercially available riparian habitat credits sell for approximately $100,000 to $150,000 per credit acre, and native fish conservation credits sell for between $75,000 and $180,000 per credit acre. The pricing of each credit type is dependent on location, availability, and entitlement and construction costs.

Technical Approach for the Bank Project

During planning and design of the Southport EIP, WSAFCA analyzed several project alternatives including multiple setback levee lengths and setback widths (i.e., distance the levee was setback from the existing levee). Through this process, WSAFCA has identified an alignment that best meets the flood risk and recreation objectives while also providing for floodplain and habitat restoration opportunities. This alignment is presented in the 65% design that is scheduled for release in January 2013.

Design of the Bank project in the setback area would be initiated once the Southport EIP 65% design and the public review period for the EIS/EIR are underway, which is expected in early 2013. WSAFCA has assembled a multidisciplinary team of experts in levee design, hydraulic modeling, mitigation bank design, and geomorphology. This multidisciplinary team's approach is to integrate hydraulic modeling with geomorphic interpretation to maximize restoration benefits while balancing flood objectives. The approach utilizes the two-dimensional, hydrodynamic and morphological model MIKE21C to develop a geomorphically-based analytical tool for assessing the timing, duration, location, depth, and flow direction of floodplain inundation under existing and setback conditions for a 12-mile reach of the Sacramento River. An improved understanding of the timing, extent, frequency, depth, and duration of floodplain inundation is achieved using this approach and this information is extremely valuable in developing restoration designs that will maximize seasonal benefits to aquatic species.

The technical approach for the Bank project will consider eco-hydrologic criteria presented in Table 1.

Table 1. Summary of Eco-hydrologic Criteria and Flows for State of California West Sacramento Floodplain Mitigation Bank

Species	Season	Duration	Interannual Frequency	Flow (cfs)	Approximate Recurrence Interval (years)	Approximate Water Surface Elevation (NAVD 88 – ft) within Offset
Sacramento Splittail[1]	Mar-Apr	>3 weeks	1 out of 3 years[2]	33,500	1.05	10.5
Sacramento Splittail[1]	criteria as above		2 out of 3 years[2]	18,100	0.6	7
Juvenile Chinook Salmon[3]	Dec-May	>2 weeks[4]	1 out of 3 years[5]	70,100	1.9	20
Juvenile Chinook Salmon	criteria as above		2 out of 3 years[5]	32,100	1.05	10.4

Notes:

[1] Unless noted otherwise, the evaluation/design criteria for Sacramento splittail are based on Moyle et al. (2004).
[2] Sacramento splittail populations are expected to benefit from increasing frequency of appropriate habitat conditions on floodplains.
[3] Unless noted otherwise, the evaluation/design criteria for Chinook salmon are based on Moyle (2002).
[4] Floodplain benefits for juvenile Chinook salmon increase with increasing duration of floodplain inundation in winter and spring (Sommer et al. 2001); inundation periods of two weeks are considered a minimum duration for juveniles to establish residency and experience enhanced growth on floodplain.
[5] Chinook salmon populations are expected to benefit from increasing frequency of appropriate habitat conditions on floodplains.

To date, the following elements leading to 65% design (currently under internal review) have been completed.

- Baseline topographic surveys; existing utility surveys and mapping; bathymetric surveys; hydraulic data development including Acoustic Doppler Current Profile (ADCP – flow and velocity) measurements and river stages for model calibration purposes; geomorphic data development including suspended and bedload sediment transport measurements; and erosion assessments along the river bank of the Sacramento River through the project reach.
- Extensive geotechnical investigations, including numerous boreholes and soils tests in the setback area and existing levee, to characterize geologic conditions including underseepage issues.
- Assessment of biological and ecological conditions along the riverbank and setback area, including identification of sensitive species.
- Hydrodynamic and sediment transport modeling to identify system-wide and localized impacts of levee setback alternatives, and potential mitigation options.

- Property surveys and investigations.
- Optimization of setback grading to provide material for levee construction and identification of additional borrow material sites.
- Development of geotechnical designs for the new levee, including seepage berms and cutoff walls.
- Development of preliminary erosion control measures for the setback area, the new levee, and the remnant riverbank of the Sacramento River, including biotechnical bank stabilization measures.
- Development of 65% design level plans, specifications and cost opinions, including the Design Documentation Report (DDR).
- Preparation of the Southport EIP draft EIS/EIR for public review and preliminary regulatory permitting applications.

Integration of the Southport EIP and Bank Project

Given the integrated nature of the Southport EIP and Bank project, opportunities exist to achieve efficiencies during both design and construction of the projects if conducted concurrently. These could include, for example, design of the floodplain terrace in the setback area, demonstration of the hydraulic feasibility, permitting, and equipment mobilization, among other activities. If the efforts are conducted in parallel, the FESSRO-funded portions of the Bank project would focus on fine grading, plans and specifications, construction of habitat related features, and post-construction monitoring and establishment. An addendum to the Southport EIP would likely be required to secure NEPA/CEQA compliance.

Costs for flood risk reduction components with no nexus to development of the mitigation bank or that solely benefit the flood risk reduction project will be funded through the EIP. WSAFCA will perform all land acquisition required for the Bank project under the State EIP program.

Project Objectives

The Bank project would be developed in the Southport EIP setback area for approximately four miles along the Sacramento River. The Bank would bank would yield approximately 120 riparian floodplain and endangered species conservation credits, and has the potential to create up to approximately 21,000 linear feet of restored and enhanced shaded riverine aquatic (SRA)/channel margin habitat available as mitigation credits on a per-linear foot basis. The objectives listed below are based on maximizing the value of the habitat area. The restoration objectives developed for the Bank include:

- Provide compensatory mitigation credits for impacts on protected land cover types and on special-status species and potential habitat for these species.
- Conduct channel margin habitat/SRA enhancement and preservation activitiesusing biotechnical methods.
- Enhance setback ecological values using topographic and vegetation/habitat heterogeneity.

- Restore portions of the historic Sacramento River floodplain (i.e., waters of the United States).
- Restore riparian and oak woodland habitat on the exposed floodplain that will create continuous habitat corridors for wildlife movement.
- Design habitat features to minimize future maintenance obligations (e.g., reduce opportunities for sediment and debris accumulation).
- Design floodplain planting and vegetation management schemes to avoid undesirable hydraulic and sediment transport impacts on the setback levee and setback area.

The preliminary target habitats to be restored were identified based on an evaluation of the current extent and condition of riparian and upland habitat, the historical conditions of the Sacramento River floodplain and its associated habitat values, the post-project floodplain conditions, and a review of similar projects in the region.

Enhancement and preservation of existing channel margin habitat/SRA will be done on a limited basis in order to work within the budget framework of the FESSRO grant solicitation and create marketable credits comparable to what exists in the commercial market. There is opportunity to carry out more extensive channel margin habitat restoration actions for specific clients or restoration plans (e.g., the proposed Bay Delta Conservation Plan's Biological Goals and Objectives), but implementation of those actions would be subject to unique partnerships with the appropriate public entities and are beyond the scope of the grant solicitation and this proposal.

Project Constraints

Because this project is associated with the Southport EIP and would be implemented by the WSAFCA, the project is being proposed in a context of some uncertainties and constraints. WSAFCA's primary mission is to reduce flood risk for the City of West Sacramento while seeking to maximize recreation opportunities for its residents. The Southport EIP presents an opportunity to achieve this mission and improve environmental floodplain values. Mandatory to the success of the Southport EIP is a hydraulically neutral and sustainable flood project. To the extent that this is achieved, WSAFCA is open to participating in the Bank project. WSAFCA believes the goals of the Southport EIP and Bank project can be balanced for an overall improvement to the flood system and the environment for the benefit of the State, WSAFCA, and the City of West Sacramento. Specific constraints, such as setback area resilience to Sacramento River channel migration caused by failure of erosion control measures, operation and maintenance agreements, and perhaps others, will need to be fully identified and considered during design and implementation of the Bank project.

As a flood risk reduction agency, WSAFCA has limited financial and political ability for habitat restoration beyond that required for project mitigation associated with the Southport EIP. WSAFCA will partner with the State to identify responsible parties for land ownership, bank ownership, and operations and maintenance, given that the majority of the mitigation credits will be utilized by the State. Further, WSAFCA and the State will need to work closely together on the financial details of the project to ensure that the interests of both agencies are met.

Figures

The pages below present figures of the following:

Figure 1 – State of California West Sacramento Flood Mitigation Bank Location Map

Figure 2 – State of California West Sacramento Flood Mitigation Bank Concept Plan

Figure 3 – State of California West Sacramento Flood Mitigation Bank Typical Section

TASKS – SCOPE OF WORK

Task 1.0 Project Management

WSAFCA and team will carry out project management duties including management of the scope, schedule, and budget and communication with agencies and stakeholders. Lastly, WSAFCA will work with the State on administration of the FESSRO grant.

Task 1.1 Project Management

Perform project management duties to ensure the project operates within approved scopes, schedule, and budget and in accordance with all applicable rules, regulations, and laws. Typical duties associated with project management include regular communication with the team, subcontractors, agencies, and stakeholders; preparing for and attending meetings; schedule monitoring and maintenance; scope and budget monitoring; and various written correspondence and product development.

Because this project is dependent upon the Southport EIP, which is already underway, solicitation of additional contractors would not be necessary for the planning and design. However, scopes of work for contractors already under contract would require modification. Scopes of work would be prepared by the contractors and submitted to WSAFCA for review. New scopes of work will be awarded if fair and reasonable. Construction contracts for preparation of the site would likely be included in the Southport EIP construction contract and would be obtained in accordance with EIP guidelines. For construction, a separate contractor specializing in environmental restoration would be hired for installation of vegetation and associated light infrastructure.

Meetings would occur frequently during design development and would continue during construction, although the participants would change from design to construction phases. Frequent conference calls also would be part of the management process.

Deliverables

- Meeting agendas and minutes
- Schedule updates
- Written correspondence
- Memoranda and other written documentation

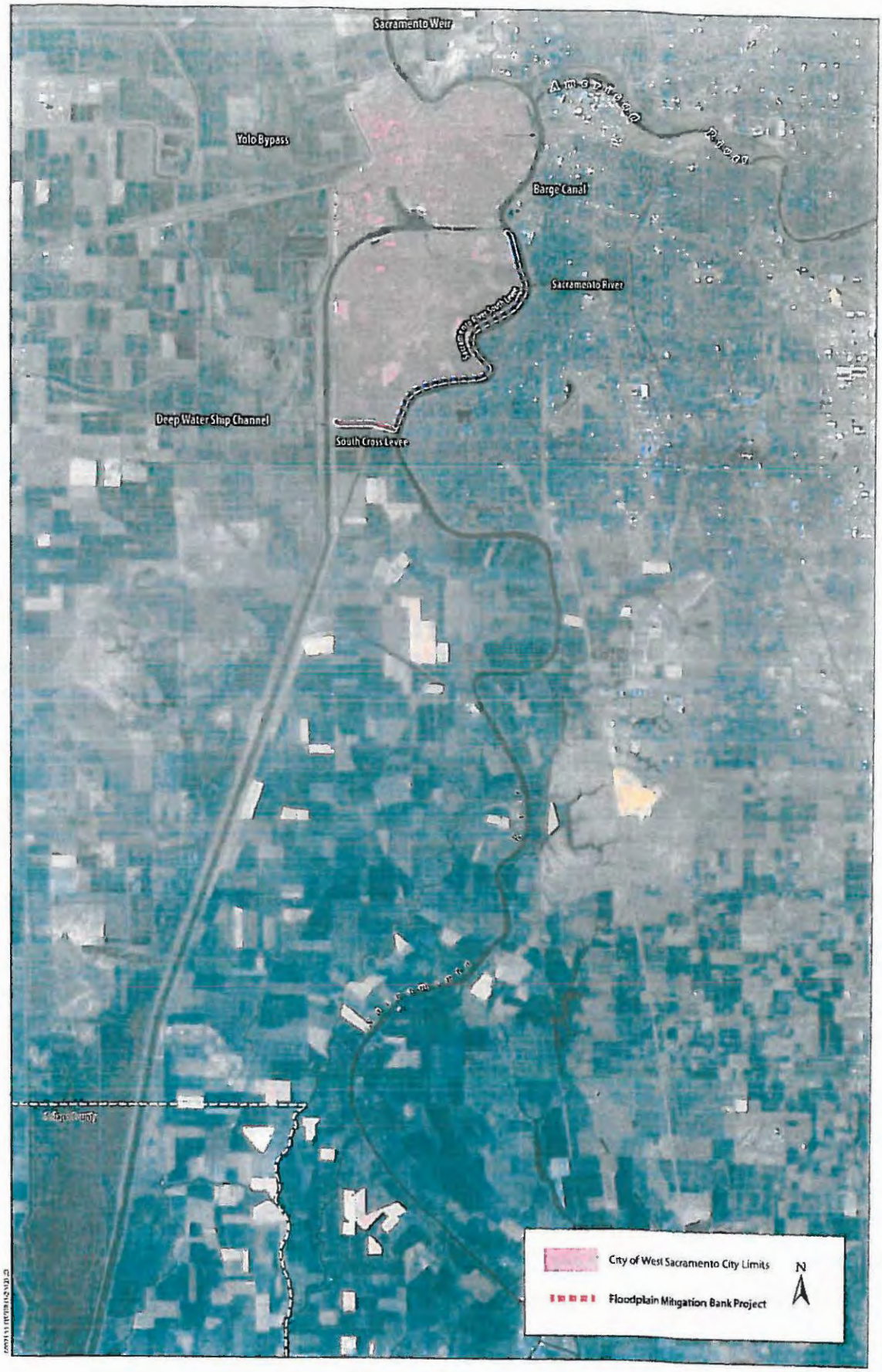

Figure 1
State of California West Sacramento Floodplain Mitigation Bank
Location Map

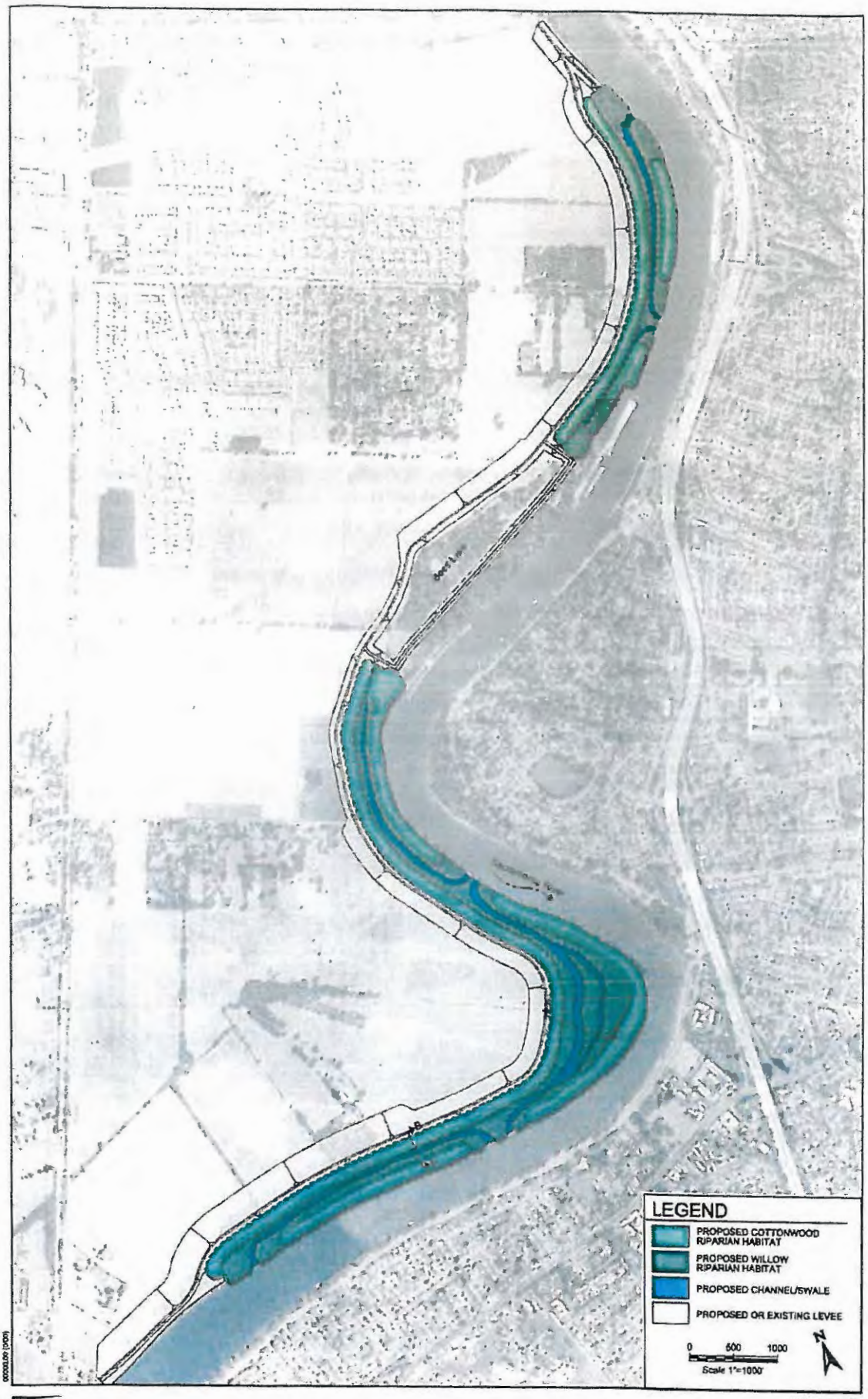

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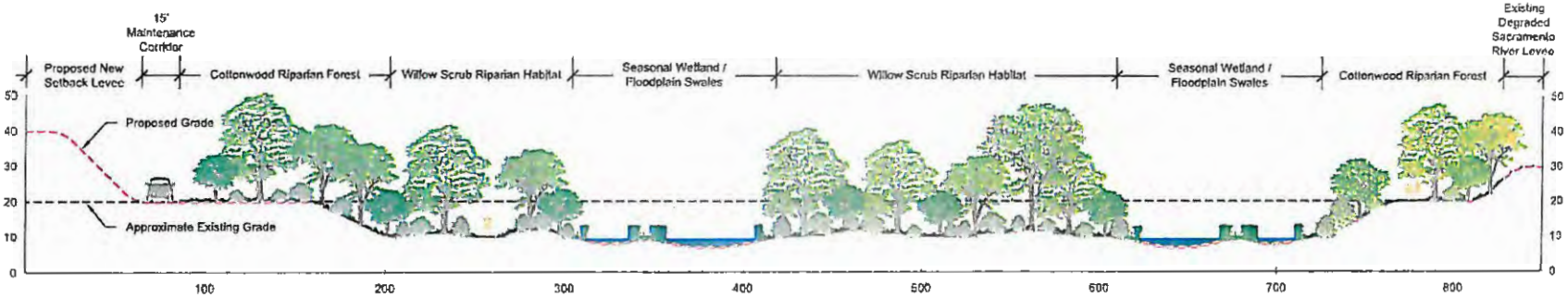
Figure 2
State of California West Sacramento Floodplain Mitigation Bank
Concept Plan



Section A-A
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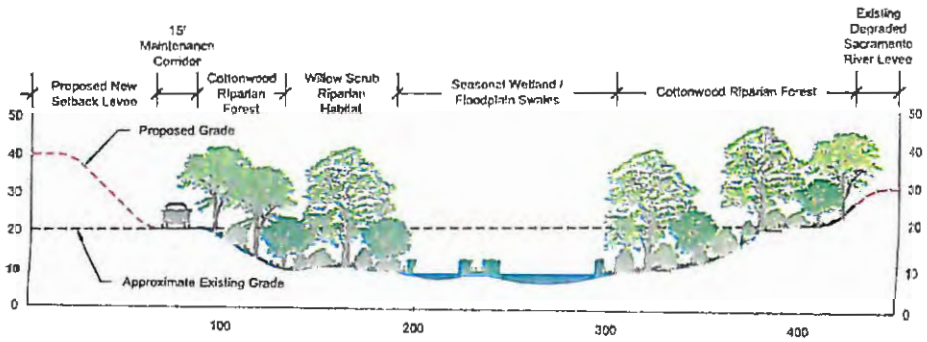
Vertical Scale Exaggerated 2x
Vertical Datum: NAVD 88



Section B-B
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Vertical Scale Exaggerated 2x
Vertical Datum: NAVD 88

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Figure 3
State of California West Sacramento Floodplain Mitigation Bank
Typical Sections

Task 1.2 Grant Administration

Beyond typical project management duties, grant administration services would be required for this grant to ensure it is administered appropriately and within applicable rules, regulations, and laws. This task would include communicating with DWR related to the grant itself (as opposed to the project); preparation of quarterly reports and deliverables; preparation of electronic reports, email and phone correspondence related to the grant; and other necessary tasks.

Deliverables

- Quarterly reports
- Electronic reports
- Invoices, written correspondence
- Memoranda and other written documentation

Task 2.0 Right of Way and Lands

Land and easement acquisitions will be carried out under the Southport EIP, as specified in the Southport EIP funding agreement with DWR. The lands, easements, and rights-of-way necessary for construction, operations and maintenance, including those rights required for the flood management structures, temporary construction areas, mitigation sites, borrow sites, spoil sites, access/haul routes, staging areas, private utility relocations; and providing relocation assistance for qualified occupants of acquired property, as required by state and federal statutes, rules and regulations, will be determined as part of the Southport EIP. This will be accomplished with a Project Real Estate Plan that includes such details as a narrative description of the real estate requirements with a breakdown of the estimate of total acreage to be acquired; type of real property interests to be acquired; and cost projections of eligible real estate project costs, including crop damages and loss of good will. The Project Real Estate Plan will be prepared and submitted to DWR for review and approval as part of the Southport EIP.

Task 2.1 Appraisal Activities

Right of way appraisals will be carried out under the Southport EIP and meet the standards set forth in the EIP program. Activities will include surveys, map development for existing lands, easements, and utilities, plat and legal descriptions, site assessments, right of entry, appraisal services, independent appraisal reviews, and coordination with landowners and agencies.

Deliverables

- Draft and final appraisals
- Independent review certifications

Task 2.2 Acquisition Activities

Acquisition will be carried out under the Southport EIP and meet the standards set forth in the EIP program. Activities will include development of contracts, conveyance documents and escrow instructions; meeting with property owners to explain appraisal, contracts, maps,

exhibits or other acquisition-related documents and convey documents until acceptance or impasse is reached; and land acquisition (purchase).

WSAFCA will also provide relocation assistance to affected residential and commercial property owners. Relocation assistance will consist of property owner interviews, site visits, and developing a relocation package specific to each displace. WSAFCA will develop a relocation plan that will conform to the Uniform Relocation Act and that meets DWR requirements.

Deliverables

- Settlements
- Parcel diaries
- Contracts
- Deeds
- Other correspondence including impasse memoranda
- Relocation plan

Task 3.0 Preparation of Mitigation Bank Documents

A BEI will be prepared for the Bank project and will provide all the necessary legal agreements, project background, and operations, monitoring, and maintenance protocols for the project.

Task 3.1 Preparation of Mitigation Bank Prospectus

As part of the mitigation bank approval process, a detailed prospectus for the Bank project will be prepared for review and approval by the appropriate Interagency Review Team (IRT). This prospectus will be used to quantify and assess the merits of the mitigation bank concept at the project site. The prospectus will contain the following information.

- General description of the Bank site.
- Design methodology and rationale.
- Proposed service area.
- Proposed crediting and release schedule.
- Monitoring and contingency plans.
- Site-specific conservation and management agreement outlining financial assurances and proposed long-term management of the site.
- Long term conservation mechanism.

The completed prospectus will be reviewed by the IRT and will serve as the basis for assigning credit value to the restoration actions in the setback area and for preparation of the BEI.

Deliverable

- Mitigation Bank Prospectus

Task 3.2 Preparation of Bank Enabling Instrument

The BEI will serve as the legal agreement between the bank sponsor and resource agencies for operation and management of the mitigation bank. The BEI will contain all of the contents of the prospectus but in greater detail, plus the following:

- Recitals and legal agreement
- Bank operation information
- Reporting requirements
- Responsibilities of the bank owner and IRT
- Other provisions
- Appendices, including:
  - Interim and Long-term management plans
  - Real estate records and assurances
  - Credit table, credit purchase agreement, and credit transfer template
  - Phase I Environmental Site Assessment
  - Appropriate resource surveys

Deliverable

- Bank Enabling Instrument

Task 4.0 Environmental Permitting and Compliance

Implementing the Bank project will require compliance with several local, state, and federal regulatory processes. The following sub-tasks outline the regulatory permitting and environmental review processes that will be completed as part of the project development.

Task 4.1 Initial Site Assessment

WSAFCA will perform an initial site assessment of the Bank site to document existing physical and ecological conditions and collect information that will support the planning, permitting and design tasks. The project team will conduct an initial site assessment to characterize the general site features; existing vegetation and habitat; existing hydrology, hydrodynamics, and geomorphology; and presence of special-status species.

In addition to in-the-field assessments, the site assessment will be supported by existing data, models, studies, and reports developed during the Southport EIP or other relevant efforts.

Deliverable

- Initial Site Assessment Report

Task 4.2 CEQA/NEPA Compliance

WSAFCA and USACE are currently developing an environmental document for the Southport EIP but, due to scheduling constraints, the document may not include all relevant information for

adequate environmental analysis of the Bank project. To achieve the necessary CEQA/NEPA compliance, WSAFCA will prepare a supplemental environmental document to accompany the existing Southport EIP EIS/EIR. The purpose of this supplemental document will be to provide additional information and analysis on project features and actions that may not have been covered in the original Southport EIP environmental document.

Activities for CEQA/NEPA compliance will require significant coordination with several State and Federal agencies, as well as with the public and stakeholders. Public noticing and meetings will be required and will require support activities.

Deliverable

- Administrative drafts and final CEQA/NEPA documents.
- Supporting documents such as public notices and response to comments

Task 4.3 Clean Water Act Section 404 Compliance (Section 404)

WSAFCA will work with USACE and other appropriate agencies to obtain the necessary Section 404 approvals. Under Section 404 of the CWA, a permit or Letter of Permission (LOP) is required from USACE for the placement of dredged or fill material into waters of the United States, including wetlands. Most of the Bank site is located within the ordinary high water mark of the Sacramento River and thus falls under Section 404 jurisdiction, necessitating this permit from USACE. Coordination with USACE will determine whether a Nationwide 27, LOP, or Individual Permit is the most advantageous pathway.

WSAFCA will coordinate with USACE throughout the process to seek appropriate compliance documentation. Documentation will include, at a minimum, a wetland delineation, report, and map; preparation of habitat mitigation plan; and preparation of draft and final permit applications. In addition to product-driven activities, WSAFCA will attend meetings and participate in conference calls as necessary.

Because implementation of the Bank project will likely affect sensitive resources or habitats, WSAFCA will need to prepare a Mitigation and Monitoring Proposal (MMP) detailing impacts and the proposed compensatory mitigation. The MMP will be prepared according to Corps Guidelines and the Final Mitigation Rule and will include, but not be limited to, the following:

- List of responsible parties.
- WSAFCA project description (i.e. the project requiring mitigation).
- Discussion of site characteristics including existing wetlands and other waters, and other sensitive resources occurring in the Bank project area.
- Discussion of functions of existing resources.
- Description of the proposed compensatory mitigation (most likely self-mitigating with credits from the Bank project).

Deliverables

- Draft and final wetland delineations
- Draft and permit applications

- Draft and final MMP
- USACE Section 404 approval

Task 4.4 Federal Endangered Species Act (Section 7)

The project is proposed in an area known to have the potential for species and their habitat protected under the Federal Endangered Species Act (ESA), Migratory Bird Treaty Act, and Magnuson-Stevens Act, as administered by USFWS for terrestrial and certain aquatic species and NMFS for aquatic species. ESA compliance is required for USACE authorization.

WSAFCA will conduct a search of existing records and will conduct field surveys (e.g., botanical and elderberry survey, giant garter snake survey, Swainson's hawk and other raptor survey, bat survey) of the project area to assess potentially affected biological resources, supported by information on file from the prior programmatic document and other projects.

WSAFCA will coordinate with the USACE, USFWS, NMFS, and DFG throughout the process to seek a biological opinion (BO) from each Federal agency and the corresponding state agency. WSAFCA will prepare a biological assessment (BA) that will include descriptions of the proposed action, suitable or occupied habitat that may be directly and indirectly affected, the manner in which the action may affect listed species or critical habitat, and proposed measures to minimize or avoid adverse effects. The BA for NMFS will also include an Essential Fish Habitat assessment pursuant to the Magnuson-Stevens Fishery Conservation and Management Act. The BAs are intended to provide incidental take coverage.

WSAFCA will work with the USACE and other appropriate agencies to facilitate and conduct ESA consultation including attendance at and preparation for meetings, preparation of BAs and other documents as necessary, and other activities needed to support ESA consultation.

Deliverables

- Survey reports and technical documents
- Draft and final BAs
- BO/Letter of Concurrence

Task 4.5 National Historic Preservation Act Section 106 Documentation

The project is proposed in areas known to have the potential for cultural resources that are listed or are potentially eligible for listing on the National Register of Historic Places, and are therefore protected under the federal National Historic Preservation Act (NHPA), Section 106. NHPA compliance is required prior to the issuance of a Section 404 permit. The project areas are also known to have the potential for resources that are of interest to Native Americans.

WSAFCA will conduct a records search and reconnaissance-level cultural resources surveys at each site in addition to conducting a field inventory and consulting with interested parties.

Deliverables

- Draft and final NHPA letter of concurrence request and supporting documents
- Letter from SHPO

Task 4.6 Fish and Wildlife Coordination Act Support

This task entails support to USACE and USFWS to prepare the Fish and Wildlife Coordination Act Report (CAR). WSAFCA will prepare and provide necessary information to USFWS and NMFS, via USACE, in support of those agencies' preparation of a CAR. WSAFCA will attend field and office meetings and conference calls, as necessary.

Deliverables

- Supporting documentation as requested
- CAR

Task 4.7 California Endangered Species Act (Section 2081)

The project area potentially contains species and their habitat that are protected under the California Endangered Species Act (CESA), as administered by DFG, and an incidental take permit (ITP) will be necessary. WSAFCA will work with DFG and other appropriate agencies to facilitate and conduct ESA consultation, including attendance at and preparation for meetings, preparation of documents as necessary, and any other activities needed to support consultation.

Deliverable

- Incidental take permit

Task 4.8 California State Fish and Game Code (Section 1602)

A streambed alteration agreement, in compliance with Section 1602 of the California Fish and Game Code, is required when projects will substantially divert, obstruct, or change the natural flow of a river, stream or lake; substantially change the bed, channel, bank of a river, stream, or lake; or use material from a streambed. The planting activities within the Bank site and any improvements to the Sacramento River channel margin will require this agreement. WSAFCA will work with DFG and other appropriate agencies to facilitate a streambed alteration agreement, including attendance at and preparation for meetings, preparation of documents as necessary to support an agreement, and other activities as necessary.

WSAFCA will prepare and submit the application package, describing the project features; construction period; construction methods; impacts on vegetation, fish, and wildlife; and the proposed monitoring plan. WSAFCA will coordinate with DFG throughout the process to seek appropriate compliance documentation. To support the application, WSAFCA will conduct an arborist survey.

Deliverables

- Draft and final permit applications
- Section 1602 permit

Task 4.9 Clean Water Act Section 402 Compliance

Under Section 402 of the CWA, a Storm Water Pollution Prevention Plan (SWPPP) is required to obtain coverage under the state General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ) (General Permit),

issued by the State Water Resources Control Board (SWRCB). For reference, the General Permit represents a substantial expansion of the previous general permit and entails a more detailed SWPPP and rigorous site monitoring and reporting to the SWRCB.

WSAFCA will work with the SWRCB and other appropriate agencies to prepare a SWPPP and obtain a Section 402 permit. Activities would include attendance at and preparation for meetings, preparation of documents as necessary to support the SWPPP and permit, field visits and records searches, and other activities as necessary.

Deliverables

- SWPPP
- Section 401 permit coverage

Task 4.10 Clean Water Act Section 401 Compliance

CWA, Section 401, requires that the discharge of dredged or fill material into waters of the United States, including wetlands, does not violate state water quality standards. As required by Section 404 of the CWA, water quality certification from the Regional Water Quality Control Board (RWQCB) must be obtained for permit compliance. WSAFCA will compile the necessary information and submit a complete certification package to RWQCB. WSAFCA will coordinate with the RWQCB throughout the process to seek appropriate compliance documentation.

Deliverables

- Draft and final request for certification
- Certification by RWQCB.

Task 4.11 Central Valley Flood Protection Board (CVFPB) Encroachment Permit (Title 23)

The Bank site is within the Sacramento River floodplain, a California state-designated floodway, and has the potential to affect flood flow conveyance; therefore, a floodway encroachment permit from the CVFPB will be necessary. WSAFCA will work with staff at the CVFPB to develop and process and encroachment permit application. Activities would include attendance at and preparation for meetings; preparation of permit application backed up by hydraulic modeling of the proposed habitat enhancements and other documents necessary to support hearing and approval of the permit; and other activities as necessary.

Deliverables

- Encroachment permit application
- Encroachment permit

Task 4.12 Yolo County Grading Permit

A Yolo County grading permit will be required for the project because it is anticipated that more than 1 acre of ground will be disturbed during fine grading of the Bank site, plant installation, and enhancement of the Sacramento River channel margin. WSAFCA will work with staff at Yolo County to develop and process the necessary documents in support of the permit.

Activities would include attendance and preparation for meetings, preparation of permit application and other documents necessary to support the permit, and other activities as necessary.

Deliverable

- Yolo County grading permit

Task 5.0 Conceptual Designs

The team will update existing preliminary sketches of the Bank site to reflect current site conditions and the initial site assessment, and develop detailed conceptual designs for restoration site features. The concept design will focus on two primary areas: SRA, or channel margin habitat, and floodplain habitat. This will include preparing plan view concepts and illustrative cross-sections, along with supporting descriptions, approximate acreages, and typical restoration costs.

Task 5.1 Physical Concept Design

Using information from the Southport EIP and the initial site assessment, WSAFCA will develop a physical concept design for ecological enhancement. Using data and models described above under *Technical Approach for the Bank Project*, the preliminary design will be enhanced to incorporate substantial topographic heterogeneity and other features that will support a diverse mosaic of natural habitats. Enhancements for the transitional "edge" habitat will be analyzed using hydrodynamic and sediment transport models to ascertain design parameters such as water surface elevation, velocity, and shear stress over a range of flows. These parameters will inform planting design such that appropriate vegetation is installed at different elevations. Velocity and shear stress will inform the vegetation design so that vegetation is resistant to shearing forces, and maximize the designs' longevity through resistance to erosive forces. Modeling will also be used to indicate potential areas of sediment accretion and scour.

Similarly, modeling tools will be utilized to predict floodplain inundation area, depth, frequency, timing and duration for a variety of floodplain setback elevations. This analysis combined with habitat evaluation criteria will help inform the selection of vegetation, whether riparian, wetland or upland, for proposed planting palettes. Construction elevation grades will be established that create topographic heterogeneity in order to establish a mosaic of habitats. Potential impacts on flood conveyance will be ascertained by modeling the vegetative roughness of the proposed planting palettes developed through other tasks.

Deliverables

- Concept sketches, including typical sections, profiles, and plans for incorporation into final design.
- Technical memorandum providing details of modeling analysis, as support documentation.

Task 5.2 Ecological Concept Design

In combination with the physical design elements described in the previous task, WSAFCA will develop an ecological concept design to support habitat enhancements that will benefit an extensive, successful mitigation bank. The main elements of the ecological concept design will include development of habitat evaluation criteria that relate physical modeling predictions to the ecological requirements of a variety of target species, and planting palettes for a mosaic of habitats.

Deliverables

- Habitat evaluation criteria and planting palettes for incorporation into the concept designs.

Task 6.0 Detailed Design

Based on plan view concepts, illustrative cross-sections, supporting descriptions, approximate acreages, and typical restoration costs developed during conceptual design, the team will develop 65%, 90%, and 100% designs and cost estimates, and conduct appropriate reviews of these documents.

Task 6.1 65% Plans, Specifications, Design Memoranda, and Cost Estimates

This task entails preparing construction drawings and specifications for revegetation, habitat enhancement, and fine grading of the setback area at a 65% level. WSAFCA will develop detailed construction drawings and specifications that are based on concept drawings for enhancement described under Task 5, and the full Southport EIP construction drawing package. The 65% setback construction drawings will include site preparation plans, planting plans for the setback area habitats, irrigation plans, erosion control plans, and construction detail sheets. If needed, implementation phasing will be included on the plans. Written specifications will be prepared to accompany the construction drawings in a format consistent with the larger Southport EIP.

The conceptual plans will be modified to incorporate updated topographic data, if available. The drawings will be updated to conform to local agency drafting standards.

Coordination with existing utility owners will be required and utility locations will be identified and marked on the plans; however, it is not anticipated that utility relocation or replacement will be required.

Grading plans, including base bid items only, and additive bid items if required, will be produced for the 65% submittal. Following preparation of the 65% grading plans, earthwork volume estimates will be produced based on the grading plans and other construction quantities will be estimated. Cost estimates will be prepared based on these quantities.

Based on the estimated volume of excess material, if any, grading plans will be developed for local placement of excess excavated material, preferably onsite. Coordination will be undertaken with the stakeholder groups to determine the requirements and constraints to onsite soil placement. The plans will include haul roads and stockpile layouts. The grading plans will balance multiple project objectives, including preservation of land proposed for other habitats and flood conveyance.

A third party constructability review will take place once the 65% construction drawings are complete.

Deliverables

- 65% setback construction drawing set.
- Written specifications.
- Cost estimates.

Task 6.2 Partial 90% Plans, Specifications, Design Memoranda, and Cost Estimates

Upon receipt of comments on the 65% design documents and following team meetings and regulatory agency review, WSAFCA will prepare a partial 90% design document set allowing for several iterations for review and development of certain project features without preparation of an entire construction document iteration. Stand-alone exhibits and construction drawing sheets will be accompanied by written memoranda describing design rationale and background. Updated construction quantity estimates will also be submitted to the client for use in preparing the cost estimate.

A third party constructability review will take place once the 90% complete plan sheets and exhibits are complete.

Deliverables

- 90% setback construction drawing set
- Written specifications
- Cost estimates.

Task 6.3 100% Plans, Specifications, Design Memoranda, and Cost Estimates

Final signed and stamped plans and specifications will be submitted to the client for use as bidding documents. All drawings and specifications will be stamped by a California-licensed landscape architect and civil engineer.

In addition, construction documents will be completed and compiled (including preparation of Division 0 documents) to produce a complete bid package with the preparation of the construction schedule.

Deliverables

- Stamped and signed plans
- Specifications
- Cost estimate
- Bid package
- Construction schedule

Task 7.0 Construction

Task 7.1 Bidding

Upon completion of the design documentation, the bidding process will begin. The following elements will be involved with the bidding process.

- Prepare bid documents
- Advertise project
- Award project construction

A bid document package will be prepared for distribution during the construction bidding process. Once the bid package is prepared, the project will be advertised to solicit restoration contractors to submit proposals on the project. The advertisement will include general information about the project and the bidding schedule.

A mandatory pre-bid meeting will be held at which the bid package will be distributed to prospective contractors. The bid package will include a specific date by which contractors will be required to submit their proposals. During the bidding process, bidders' questions will be answered or addenda distributed to clarify information in the bid package.

Once project bids have been submitted, contractor submittals will be reviewed and a summary will be prepared to compare the submittals. WSAFCA and DWR will review this summary and select a contractor.

Deliverables

- Bid notice
- Award notices

Task 7.2 Construction Management

Construction management will occur daily during construction. This will involve the following elements.

- Construction contract administration, including review of work plans, schedules, budgets, and cash flow projections; evaluation of value engineering proposals; evaluation of change orders; and review of invoices for progress payment.
- Preparation of a daily log of construction activities.
- Take photographs to document site conditions, construction progress.
- Conduct weekly progress meetings with the contractor and prepare progress reports.
- Manage the construction schedule.
- Conduct preconstruction biological surveys, special-status species worker awareness training, and construction monitoring for sensitive biological resources during construction.

- Conduct cultural resource surveys, training, and construction monitoring near known cultural resources.
- Coordinate approval of and oversee implementation of design changes.
- Cost management associated with construction of the approved plans and specifications.
- Coordinate construction activities with DWR and USACE staff to communicate issues of concern, provide required information, and respond to questions.
- Review and processing of contractor submittals and requests for information (RFIs).
- Construction inspections to ensure that contractors' work is performed in accordance with construction plans and specifications, and is consistent with the intent of the design.
- Quality assurance (QA) testing to ensure compliance with the requirements of contract documents, and review of the effectiveness and adequacy of the contractor's quality control (QC) program.
- Implement start-up, closeout and acceptance procedures for the systematic, orderly and timely completion, acceptance, and transfer of facilities constructed, as well as contract closeout.
- Prepare a construction summary report that will include a summary of the project history, problems encountered and resolutions made, summary of major changes, summary of bid and final project costs, QA and QC testing results, photographs depicting construction work, and project record drawings.

Deliverables

- Meeting agendas and minutes.
- Memoranda; construction schedules.
- Change orders, logs, reports, and other documentation.

Task 7.3 Project Construction

Project construction includes preconstruction and construction activities. Preconstruction activities include preconstruction surveys for special status species, mobilization, and site preparation. Preconstruction surveys will document the presence or absence of special-status species. Once the surveys are complete, appropriate mitigation measures will be taken to protect the resources present, and the methods and findings of the surveys will be documented and submitted to the appropriate resource agencies.

Once preconstruction surveys have been completed, the contractor will mobilize equipment and do the following.

- Establish construction access.
- Installation of erosion crontrol measures.
- Set up the equipment and material staging area(s).

- Establish a construction water source (if needed).
- Install of exclusion fencing.
- Demolition and/or clearing and grubbing.

Construction of the Bank project will begin with fine grading of the setback area (major grading will be conducted as part of the Southport EIP) in compliance with the construction documents and any earthworks measures associated with the SRA/channel margin elements. This will involve grading the channel margin slope to a create inset terraces at a flatter profile, installation of instream woody material, and placement of vegetated rock reinforcement as required. Following this, the irrigation system for the restoration plantings will be installed. Once the irrigation system is installed and confirmed to be working per the construction drawings, the plantings will be installed, including container plants or pole cuttings.

Once all planting and irrigation installation activities are complete, the site will be stabilized with the application of an appropriate restoration seed mix and/or other erosion control measures.

As-built record drawings of the completed project will be prepared once all construction activities have been completed and the completed project has been accepted by DWR or its designee.

Deliverables

- Documentation of SWPPP implementation
- As-built records
- Construction completion report
- Photographs

Task 7.4 Environmental Compliance

During construction, WSAFCA and team will conduct environmental compliance activities associated with permits obtained. Examples include special-status species surveys and monitoring, preparation of monitoring reports to resource agencies, and worker awareness training. These activities will be ongoing and subject to the requirements of the appropriate resource agencies. Progress reports (weekly, post construction) will be prepared as needed.

Deliverables

- Status and monitoring reports

Task 7.5 Labor Compliance

Labor compliance is planned to be completed by the Department of Industrial Relations under Labor Code section 1771.3. If Proposition 84 funding is utilized, then WSAFCA will adopt and enforce a certified Labor Compliance Program by soliciting quotes from a labor compliance monitoring company, executing an agreement with the most competitive company, and registering with the Depart of Industrial Relations Compliance Monitoring Unit. The budget will assume the cost to be 0.25% of the total construction cost.

Deliverable

- Payment or service agreement

Task 8.0 Habitat Performance Monitoring and Adaptive Management

Annual performance monitoring for adaptive management will be conducted for the restored floodplain and SRA/channel margin habitat.

Task 8.1 Riparian Habitat Monitoring

Per the requirements of an accepted BEI and resource agency approvals, performance of the riparian plantings will be monitored annually for the first 10 years following construction and will consist of the following.

- Vegetation monitoring conducted in accordance with the methodology developed by the California Native Plant Society, which includes collection of data along transects or within quadrats, as appropriate to the habitat type.
- Documentation of hydrological conditions, animal species observed or detected, integrity of signage and other general conditions, and corrective measures that may be appropriate to ensure relevant success criteria.
- Initial establishment of photo documentation locations and collection of photographic data.

An annual monitoring report documenting the annual performance-monitoring effort will be prepared for submittal to the appropriate resource agencies. The annual report will contain the maintenance activities conducted the previous year, monitoring methods, results from the annual vegetation monitoring, photos from the designated photo stations, wildlife observations/detections, and detailed information on efforts to remove exotic vegetation. In addition, each annual report will include qualitative field information and a summary of the documentation of the planting area conditions.

Deliverables

- Ten annual monitoring reports

Task 8.2 Shaded Riverine Habitat/Channel Margin Habitat Monitoring

Per the requirements of the BEI and resource agency approvals, performance of the SRA/channel margin habitat will be monitored annually for the first 10 years following construction and will consist of the following.

- Vegetation monitoring conducted in accordance with the methodology developed by the California Native Plant Society, which includes collection of data along transects or within quadrats, as appropriate to the habitat type.

- Qualitative and quantitative monitoring of the physical structure of the channel margin habitat, including persistence of instream woody material installation, recruitment of additional woody material, and performance of rock reinforcement.
- Documentation of hydrological conditions, animal species observed or detected, integrity of signage, and other general conditions, and corrective measures that may be appropriate to ensure relevant success criteria.
- Initial establishment of photo documentation locations and collection of photographic data.

An annual monitoring report documenting the annual performance-monitoring effort will be prepared for submittal to the appropriate resource agencies. The annual report will contain the maintenance activities conducted the previous year, monitoring methods, results from the annual vegetation and instream material monitoring, photos from the designated photo stations, wildlife observations/detections, and detailed information on the efforts to remove exotic vegetation. In addition, each annual report will include qualitative field information and the summary of the documentation of the planting area conditions.

Deliverables

- Ten annual monitoring reports

Task 8.3 Riparian Habitat Establishment

Riparian habitat within the setback area will be maintained for three years following construction. Maintenance activities will include replacing dead plants, removing flood debris and trash, maintaining the irrigation system, and repairing areas of erosion. Site inspections of the plants and irrigation system will take place weekly during the spring and summer months. During the fall and winter, site inspections will take place every two weeks or after the recession of floodwaters following storm events. An annual maintenance report will be prepared and submitted to DWR or its designee at the end of each year.

Deliverables

- Three annual maintenance reports

Task 8.4 Shaded Riverine Habitat/Channel Margin Habitat Monitoring

SRA/channel margin habitat along the Sacramento River will be maintained for three years following construction. Maintenance activities will include replacing dead plants, removing flood debris and trash, maintaining the irrigation system, and repairing areas of erosion. Site inspections of the plants and irrigation system will take place weekly during the spring and summer months. During the fall and winter, site inspections will take place every two weeks or after the recession of floodwaters following storm events. An annual maintenance report will be prepared in conjunction with the activities in Task 8.3 and submitted to DWR or its designee at the end of each year.

Deliverables

- Three annual maintenance reports

Task 8.5 Geomorphology/Sedimentation Monitoring

Setback area habitats will be monitored for sedimentation. This will consist of installing sediment plates within the setback area and establishing monitoring transects at key locations, such as through swales. These will be monitored yearly after inundation of the setback area. The purpose of this monitoring is to establish the spatial and vertical extents of sediment accretion. It will also establish if drainage swales are becoming blocked or excessive sedimentation of vegetation plantings is occurring.

Deliverables

- An annual monitoring report will be produced and submitted to appropriate resource agencies for the first three years after construction.

Task 8.6 Long-term Operations and Maintenance

Once short-term establishment of the Bank has taken place, all habitat performance objectives have been met, and all of the credits assigned, the Bank closure plan will be implemented and long-term operations and maintenance of the Bank site will commence. This will consist of annual site inspections and qualitative observations of the habitat. Vegetation coverage will be measures every 10 years via aerial photograph interpretation of canopy coverage. Annual monitoring inspection reports will be prepared and submitted to the appropriate resource agencies.

Deliverables

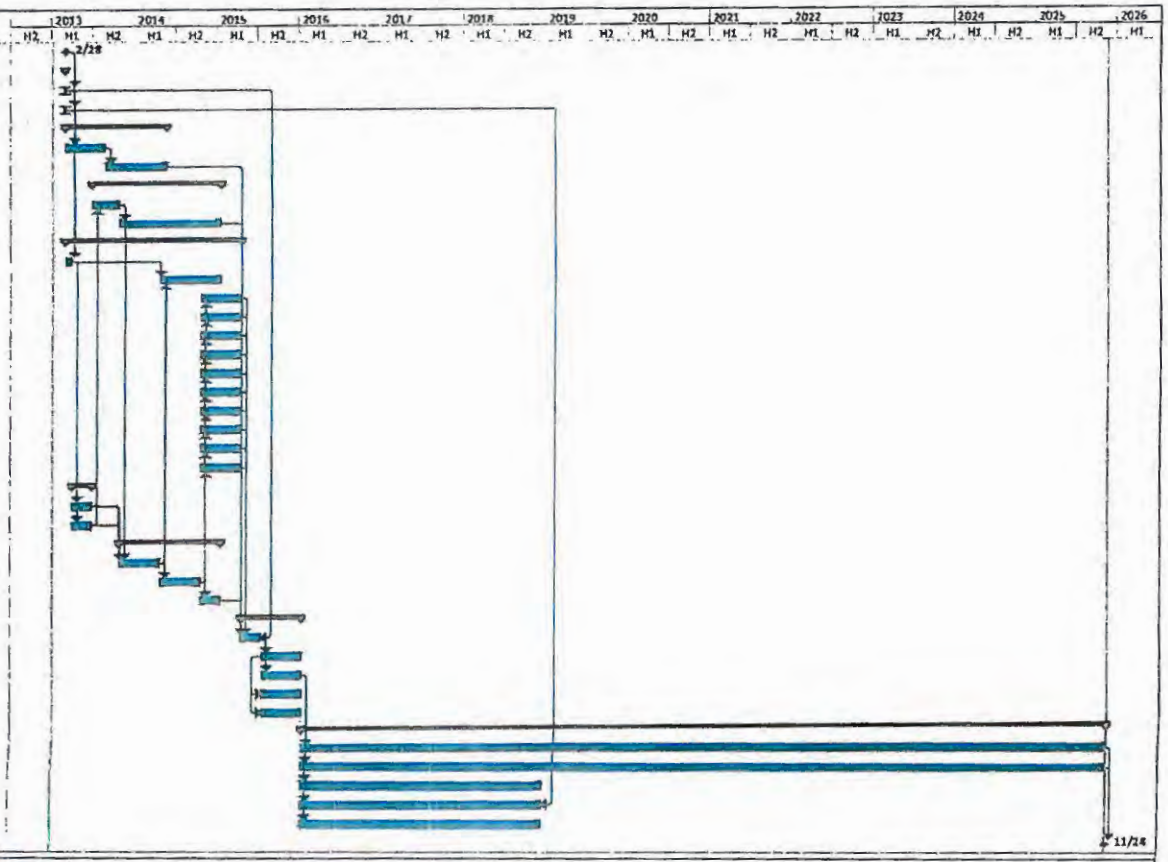
- Annual monitoring reports

SCHEDULE AND BUDGET

The scope of work submitted with this Work Plan assumes that the Bank Project is a stand-alone project, and depicts the costs if it were implemented independently of (i.e., after) the Southport EIP. For schedule purposes however, it has been assumed that the projects are implemented in tandem, and that construction of the Bank project would follow completion of the levee.

Schedule

ID	Task Name	Duration
1	Receive DWR Funding Commitment Letter	0 days
2	Task 1 Project Management	1 day
3	1.1 Project Management	1 day
4	1.2 Grant Administration	1 day
5	Task 2 Right of Way and Lands	322 days
6	2.1 Appraisal Activities	6 emons
7	2.2 Acquisition Activities	9 emons
8	Task 3 Preparation of Mitigation Bank Documents	406 days
9	3.1 Preparation of Mitigation Bank Prospectus	4 emons
10	3.2 Preparation of Bank Enabling Instrument	15 emons
11	Task 4 Environmental Permitting and Compliance	557 days
12	4.1 Initial Site Assessment	30 edays
13	4.2 CEQA/NEPA Compliance	9 emons
14	4.3 Section 404	6 emons
15	4.4 Section 7	6 emons
16	4.5 Section 106	6 emons
17	4.6 FWCA	6 emons
18	4.7 Section 2081	6 emons
19	4.8 Section 1602	6 emons
20	4.9 Section 402	6 emons
21	4.10 Section 401	6 emons
22	4.11 CVFPB Encroachment Permit	6 emons
23	4.12 SMARA	6 emons
24	Task 5 Conceptual Designs	64 days
25	5.1 Physical Concept Design	3 emons
26	5.2 Ecological Concept Design	3 emons
27	Task 6 Detailed Design	320 days
28	6.1 65% Plans and Specs	6 emons
29	6.2 90% Plans and Specs	6 emons
30	6.3 100% Plans and Specs	3 emons
31	Task 7 Construction	193 days
32	7.1 Bidding and Award	3 emons
33	7.2 Construction Management	6 emons
34	7.3 Project Construction	6 emons
35	7.5 Environmental Compliance	6 emons
36	7.6 Labor Compliance	6 emons
37	Task 8 Habitat Adaptive Monitoring and Management	2572 days
38	8.1 Riparian Habitat Monitoring	120 emons
39	8.2 SRA/Channel Margin Habitat Monitoring	120 emons
40	8.3 Riparian Habitat Establishment	36 emons
41	8.4 SRA/Channel Margin Habitat Establishment	36 emons
42	8.5 Geomorhology/Sedimentation Monitoring	36 emons
43	8.6 Long Term O&M Begins	0 days



State of California
West Sacramento
Floodplain Mitigation Bank

Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start only			
Summary		Inactive Task		Duration only		Finish only			

Page 1

Budget

The budget below assumes that land acquisition will be completed as part of the Southport EIP. Table 8.1 shows a detailed breakdown of the projected investment required to complete the Bank project. The table also provides an estimate of the total investment required from WSAFCA, DWR EIP, and FESSRO.

Table 8.1: High Level Budget

Project Role	MBK Cost Subtotal	ICF Cost Subtotal	cbec Cost Subtotal	Local Agency Cost Subtotal	Contractor	Project Total TOTAL	State EIP	State FESSRO	WSAFCA
Task 1: Project Management									
Subtotal Task 1	50,890	$ 22,200	$ 14,720	$ 16,500	$ -	$ 104,310		$ 104,310	
Task 2: Right of Way Acquisition									
Subtotal Task 2	-	$ -	$ -	$ 11,866,000	$ -	$ 11,866,000	$ 8,306,200		$ 3,559,800
Task 3: Preparation of Mitigation Bank Documents									
Subtotal Task 3	-	$ 212,650	$ 2,560	$ -	$ -	$ 215,210		$ 215,210	
Task 4: Environmental Permitting and Compliance									
Subtotal Task 4	-	$ 218,240	$ 20,800	$ -	$ -	$ 239,040		$ 239,040	
Task 5: Conceptual Design									
Subtotal Task 5	-	$ 40,840	$ 87,600	$ -	$ -	$ 128,440		$ 128,440	
Task 6: Detailed Design									
Subtotal Task 6	-	$ 108,500	$ 157,360	$ -	$ -	$ 265,860		$ 265,860	
Task 7: Construction									
Subtotal Task 7	-	$ 68,820	$ 56,160	$ -	$ 2,414,646	$ 2,539,626		$ 2,539,626	
Task 8: Habitat Establishment and Monitoring									
Subtotal Task 8	-	$ 162,300	$ 93,040	$ 350,000	$ 600,000	$ 1,205,340		$ 855,340	$ 350,000
SUBTOTAL COSTS	$ 50,890	$ 833,550	$ 432,240	$ 12,232,500	$ 3,014,646	$ 16,563,826	$ 8,306,200	$ 4,347,826	$ 3,909,800
15% Contingency	$ 7,634	$ 125,033	$ 64,836	$ 1,834,875	$ 452,197	$ 2,484,574	$ 1,245,930	$ 652,174	$ 586,470
Total	$ 58,524	$ 958,583	$ 497,076	$ 14,067,375	$ 3,466,843	$ 19,048,400	$ 9,552,130	$ 5,000,000	$ 4,496,270

Benefit Cost Ratio

Given the integrated nature of this multi-objective flood protection and mitigation bank project many assumptions were required in determining the Benefit Cost Ratio (BCR). Determining the benefit cost ratio for the Bank project is dependent on the assumed market value of the future habitat. Complicating the determination of the BCR for the Bank project is allocation of Southport EIP investments. Many of the investments required to complete the Southport EIP have a strong nexus to the Bank project. For purposes of this analysis land costs it the setback area are included part of the total Bank project. Determining the value of the SRA habitat in this location is difficult given that limited opportunities exist along the Sacramento River main channel to perform the quality of channel margin habitat improvements that can be achieved at this site. Commercially available riparian habitat credits sell for approximately $100,000 to $150,000 per credit acre, and native fish conservation credits sell for between $75,000 and $180,000 per credit acre. Lower quality SRA habitat can be purchased for about $250/LF but given the high quality habitat that would be achievable at this site it was assumed that the credit value could be as high as $500 per linear. The value of the SRA habitat may be low if it is assumed that in order to achieve the same habitat value that an equivalent project would need to construct an expensive adjacent or setback levee along the Sacramento River. Table 8.2 shows a range of BCR's between 1.2 to 1.7 given the assumptions described above. If the land costs associated with the Bank project were fully allocated to the Southport EIP flood project the BCR could be as high as 6.4 assuming the upper habitat credit values.

Table 8.2: Benefit Cost Ratio Range

Habitat Value Created	Quantity	Middle Credit Value		Upper Credit Value	
		Per Credit	Total	Per Credit	Total
Riparian Habitat (acres)	120	$150,000	$18,000,000	$180,000	$21,600,000
SRA/Channel Margin Habitat (linear feet)	21,000	$250	$5,250,000	$500	$10,500,000
Total Benefits	-	-	$23,250,000	-	$32,100,000
Projected Cost including ROW	-	-	$19,048,400	-	$19,048,400
Approximate Benefit Cost Ratio	-	-	1.2	-	1.7

California Department of Water Resources
Central Valley Flood System Conservation Framework and Strategy
Grant Application Form
November 2012

Applicant Signature Page

Applicant: West Sacramento Area Flood Control Agency

Project Title: State of California West Sacramento Floodplain Mitigation Bank

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

The individual signing the form has the legal authority to submit the proposal on behalf of the applicant, and the applicant has the legal authority to enter into a contract with the State;

There is no pending litigation that may impact the financial condition of the applicant or its ability to complete the proposed project;

The individual signing the form waives any and all rights to privacy and confidentiality of the proposal; [Note: DWR will keep confidential sensitive information related to property negotiations or legal proceedings to the extent allowed under public information disclosure laws.]

The applicant will comply with all terms and conditions identified in the Central Valley Flood System Conservation Framework and Strategy Guidelines, PSP, and future Funding Agreement if selected for funding.

Kenneth A. Ruzich, General Manager
West Sacramento Area Flood Control Agency

1/7/13
Date

Resolution 12-12-01

RESOLUTION OF BOARD OF DIRECTORS OF THE WEST SACRAMENTO AREA FLOOD CONTROL AGENCY APPROVING THE APPLICATION FOR GRANT FUNDS FROM THE CENTRAL VALLEY FLOOD SYSTEM CONSERVATION FRAMEWORK AND STRATEGY PROGRAM UNDER THE DISASTER PREPAREDNESS AND FLOOD PREVENTION BOND ACT OF 2006 (Proposition 1E)

WHEREAS, the Legislature and Governor of the State of California have provided funds for the program shown above, and

WHEREAS, the Department of Water Resources has been delegated the responsibility for the administration of this grant program, establishing necessary procedures; and

WHEREAS, said procedures established by the Department of Water Resources require a resolution certifying the approval of application(s) by the Applicants governing board before submission of application(s) to the State; and

WHEREAS, the Applicant, if selected, will enter into an agreement with the State of California to carry out the project.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the West Sacramento Area Flood Control Agency.

1. Approves the filing of an application to the Department of Water Resources for grant funding under the Central Valley Flood System Conservation Framework and Strategy Program to fund the construction of habitat in the Southport Sacramento River Early Implementation Project setback area,

2. Certifies that Applicant understands the assurances and certification in the application; and,

3. Certifies that Applicant or title holder will have sufficient funds to operate and maintain the project(s)consistent with the land tenure requirements; or will secure the resources to do so: and,

4. Certifies that it will comply with all provisions of Section 1771.5 of the California Labor Code, and,

5. If applicable, certifies that the project will comply with any laws and regulations including, but not limited to, the *California Environmental Quality Act* (CEQA), legal requirements for building codes, health and safety codes, disabled access laws, and, that prior to commencement of construction all applicable permits will have been obtained; and,

6. Appoints the General Manager, or designee, as agent to conduct all negotiations, execute and submit all documents including, but not limited to applications, agreements, payment requests and so on, which may be necessary for the completion of the aforementioned project(s).

PASSED AND ADOPTED by the West Sacramento Area Flood Control Agency on this 13th day of December, 2012, by the following vote:

AYES: Denton, Kristoff, Ramos
NOES: none
ABSTAIN: none
ABSENT: none

William E. Denton, President

ATTEST:

Kenneth A. Ruzich, General Manager

APPROVED AS TO FORM:

James M. Day, Jr., WSAFCA Attorney

MILLER STARR
REGALIA

MEMORANDUM

TO: Wilson Wendt

FROM: Sean Marciniak

RE: Legal Authority of West Sacramento Area Flood Control Agency to Apply for and Construct and Implement a Mitigation Bank

DATE: April 10, 2013

West Sacramento Area Flood Control Agency ("WSAFCA") does not have the authority to apply for or to construct and operate a Mitigation Bank. There exist three separate grounds that preclude the agency's pursuit of such a project: (1) state law that specifically enumerates the powers and authorities of WSAFCA do not permit such an activity; (2) the Joint Exercise of Powers Agreement forming the WSAFCA does not authorize the agency to create or operate a Mitigation Bank; and (3) WSAFCA's constituent members are not authorized to create or operate a Mitigation Bank, precluding WSAFCA from doing so.

A. The Joint Exercise of Powers Act, insofar as it specifically addresses the authorities of WSAFCA, do not permit the creation or operation of a Mitigation Bank. The authority of WSAFCA is set forth in Government Code section 6523, a provision of the Joint Exercise of Powers Act (Government Code section 6500 et seq.) Section 6523 grants the agency (1) the "authority to accomplish the purposes and projects necessary to achieve and maintain at least a 200-year level of flood protection" on the Sacramento River for the City of West Sacramento; (2) the ability to "exercise the authority granted to reclamation districts under Part 7 ... and Part 8 ... of Division 15 of the Water Code for the purposes of Sections 12670.2, 12670.3, and 12760.4 of the Water Code," which essentially involves the financing of a certain federal project using assessments and bonds; and (3) the power to create indebtedness and levy assessments to repay that indebtedness in order to finance the same federal project. In essence, three authorities are enumerated under section 6523, none of which authorize the construction or authorization of a Mitigation Bank.

First, section 6523 empowers WSAFCA to "accomplish the purposes and projects *necessary* to achieve and maintain at least a 200-year level of flood protection" for the benefit of the City of West Sacramento. (Emph. added.) Such an authorization should be construed narrowly. In *Beckwith v. County of Stanislaus* (1959) 175 Cal.App.2d 40, 49, the third district court of appeal — the appellate court setting precedential law over the jurisdictions within which WSAFCA operates — held that, in exercising functions under the Joint Exercise of Powers Act, an agency "must be directly concerned with the work to be performed." (*See also* 83 Ops.Cal.Atty.Gen. 82.) Neither the construction nor operation of a Mitigation Bank is "directly concerned" with the provision of 200-year flood

EXHIBIT C

protections, much less "necessary" for the achievement and maintenance of such protection. After all, the creation and maintenance of a Mitigation Bank easily can, and usually does, function independently of the construction and operation of levees and other methods of flood control.

The second power conferred by section 6523, which contemplates certain activities performed by reclamation districts, is more specific. Specifically, this statute empowers WSAFCA to levy assessments and issue bonds for purposes of implementing a flood protection project specifically contemplated under section 101(4) of the Water Resources Development Act of 1992. (Water Code §§ 12670.2, 12670.3, 12670.4, 51200 et seq., 52100 et seq.; *see* Pub. Law 102-580) Aside from the fact that the construction and operation of a Mitigation Bank qualifies as neither the levy of an assessment nor the issuance of a bond, we have reviewed engineering reports prepared for the aforementioned federal flood protection project, and these documents do not contemplate a Mitigation Bank component.

The third authority conferred by section 6523 involves the right of WSAFCA to "create indebtedness and thereafter continue to levy special assessments to repay that indebtedness" in order to finance the aforementioned federal flood protection project, pursuant to the Improvement Act of 1911 and the Municipal Improvement Act of 1913. This authority, insofar as it contemplates the implementation of a federal project that does not include a Mitigation Bank, and insofar as it contemplates the accrual of debt to finance this project, is irrelevant.

WSAFCA does not possess the authority to create habitat and sell mitigation credits pursuant to section 6523. In fact, given the statute specifically enumerates certain financing mechanisms for implementing specific flood control projects, section 6523 would appear to expressly preclude WSAFCA from engaging in other financing schemes.

B. Joint Exercise of Powers Agreement forming the WSAFCA does not authorize it to create or operate a Mitigation Bank. Even assuming that the authorities of section 6523 are not inclusive, and that WSAFCA has authorities in addition to those enumerated in that statute, the law would prohibit WSAFCA from undertaking a Mitigation Bank project.

With regard to joint power authorities in general, such an agency "shall possess the common power specified in the agreement [forming it] and may exercise it in the manner or according to the method provided in the agreement." (Government Code section 6508.) The agreement creating WSAFCA, the "West Sacramento Flood Control Agency Joint Exercise of Powers Agreement" dated July 20, 1994 ("JPA"), recognizes only that the parties to the WSAFCA have the power to "acquire and construct Works for the purpose of controlling and conserving waters for the protection of life and property that would or could be damaged by being inundated by still or flowing water." (JPA, p. 1.) The term "Works" specifically is defined to mean "dams, water courses, drainage channels, conduits, ditches, canals, pumping plants, levees, buildings, and other structures" used to control floodwaters. (JPA, p.3) In discussing the power of WSAFCA to implement projects, the agreement specifies the "Agency's Projects are intended to consist of developing, designing, acquiring, and constructing Works and Facilities[1] as well as

[1] Per the JPA, "Facilities" means "any Works financed, acquired, or constructed by the Agency." (JPA, p.3.)

funding (including local cost shares of federal projects) of the same, required to attain interim 100-year and at least 200-year ultimate flood protection." (JPA, p. 9.)

In summary, the JPA only authorizes WSAFCA to develop flood protection projects that are "required" to attain "at least 200-year ultimate food protection," reflecting the narrow scope of section 6523. A Mitigation Bank is by no means a prerequisite to implementing a flood protection project, and thus its development lies outside the jurisdiction of WSAFCA.

C. WSAFCA's constituent members are not authorized to create or operate a Mitigation Bank, precluding WSAFCA from doing so. Regardless of what the JPA says, WSAFCA could not create or operate a Mitigation Bank because at least some of its constituent members, Reclamation District No. 900 and Reclamation District No. 537, do not have the authority to undertake such a project.

Pursuant to the Joint Exercise of Powers Act, if "authorized by their legislative or other government bodies, two or more public agencies by agreement may jointly exercise *any power common to the contracting parties* ...." (Gov. Code § 6508 [emph. added].) Essentially, a joint power authority may not exercise a power that all constituent members do not share.

Here, (at least) the two reclamation districts that form WSAFCA have limited authorities, where such authorities do not include the power to create or operate a Mitigation Bank. Reclamation districts may be formed "for the reclamation of any land within any city" that is subject to overflow or incursions from the tide of inland waters. (Water Code § 50110.) In implementing any "reclamation works," state law defines this term to mean "such public works and equipment as are necessary for the unwatering, watering, or irrigation of district lands and other district operations." (Water Code § 50013.) Because the establishment and operation of a Mitigation Bank is not "necessary" for the unwatering, watering, or irrigation of district land, a reclamation district does not have the authority to undertake that type of development project.

* * *

In summary, WSAFCA is operating outside its legal authorities insofar as it may apply for monies to create or operate a Mitigation Bank. The statute that specifically speaks to WSAFCA's authorities in the Joint Exercise of Powers Act authorizes only those activities "necessary" to achieve certain standards of flood control. Moreover, the agreement forming WSAFCA, no doubt contemplating this legality, authorizes only those flood control projects "required" to attain certain standards of flood protection. Finally, at least two of WSAFCA's constituent members do not have the power to develop a Mitigation Bank, since these reclamation districts are empowered only to pursue those projects "necessary" to the reclamation of land, where the concept of reclamation is limited to the watering, unwatering, or irrigation of land, and does not include the creation of habitat, much less the sale of mitigation credits.

WSAFCA has overstepped its authorities, and must withdraw any application it has submitted for monies that would finance the design, creation, or operation of a Mitigation Bank.

From: Smith, Megan
Sent: Thursday, March 14, 2013 2:36 PM
To: 'Hogan, Phil - NRCS, Woodland, CA'; tanis.j.toland@usace.army.mil
Subject: RE: Southport Sacramento River EIP NOP

Mr. Hogan,

Attached is the layer requested; we were able to easily digitize it for you. Please note that this outline represents the expected limit of direct effects, including noise, vibration, traffic and other effects that can occur away from the direct construction area. It is not intended to represent a construction footprint or an area of disturbance. Likewise, though several areas of potential borrow are identified, the project would utilize only a small fraction of each identified parcel, and many parcels would not be impacted at all.

Please give me a call at any time if I can be of assistance.

Take care,
Megan Smith

MEGAN S. SMITH, J.D. | Sr. Project Manager | 916.231.7677 | megan.smith@icfi.com
ICF INTERNATIONAL | 630 K Street, Suite 400, Sacramento, CA 95814 | icfi.com

From: Hogan, Phil - NRCS, Woodland, CA [mailto:Phil.Hogan@ca.usda.gov]
Sent: Thursday, March 14, 2013 10:20 AM
To: Smith, Megan; tanis.j.toland@usace.army.mil
Subject: Southport Sacramento River EIP NOP

I was wondering if you could send me a GIS generated shape file from Figure 1 (EIP Study Area) so that I can make comments on the project.

Thanks

PHIL HOGAN
District Conservationist
USDA Natural Resources Conservation Service
221 West Court Street, Suite 1

Woodland, CA 95695
(530) 662-2037 X 111 (Voice)
(530) 662-4876 (FAX)
phil.hogan@ca.usda.gov

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From: Hogan, Phil - NRCS, Woodland, CA [mailto:Phil.Hogan@ca.usda.gov]
Sent: Monday, March 18, 2013 1:01 PM
To: Smith, Megan; tanis.j.toland@usace.army.mil
Subject: Southport Sacramento River Early Implementation Report

Attached are some maps that I made up for the project area.

My main concern from the information that I have so far is the potential impact on farming in the area.

PHIL HOGAN
District Conservationist
USDA Natural Resources Conservation Service
221 West Court Street, Suite 1
Woodland, CA 95695
(530) 662-2037 X 111 (Voice)
(530) 662-4876 (FAX)
phil.hogan@ca.usda.gov

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Soils Inventory Report

ARMY CORPS OF ENGINEERS

Map Unit Symbol	Map Unit Name	Prime Farmland Indicator	Acres	Percent
La	Lang sandy loam	Prime farmland if irrigated and drained	124.8	6%
Lb	Lang sandy loam, deep	Prime farmland if irrigated and drained	123.7	6%
Ld	Lang silt loam	Prime farmland if irrigated and drained	180.3	9%
Ma	Made land	Not prime farmland	2.5	0%
Mn	Merritt silty clay loam, deep	Prime farmland if irrigated and drained	0.3	0%
Rk	Riz loam	Not prime farmland	1.7	0%
Sa	Sacramento silty clay loam	Prime farmland if irrigated and drained	552.5	26%
So	Sycamore silt loam	Prime farmland if irrigated and drained	450.3	22%
Te	Tyndall very fine sandy loam, deep	Prime farmland if irrigated and drained	5.2	0%
	Valdez silt	Prime farmland if		

Vb	loam, deep	irrigated and drained	302.1	14%
W	Water	Not prime farmland	65.5	3%
Wa	Willows silty clay loam	Farmland of statewide importance	232.5	11%
Yb	Yolo silty clay loam	Prime farmland if irrigated	51.1	2%
		Total:	2092.5	100%
	Prime Farmland Total:	0	0%	

Soils Inventory Report

ARMY CORPS OF ENGINEERS

Map Unit Symbol	Map Unit Name	Prime Farmland Indicator	Acres	Percent
La	Lang sandy loam	Prime farmland if irrigated and drained	34.4	5%
Lb	Lang sandy loam, deep	Prime farmland if irrigated and drained	100.4	15%
Ld	Lang silt loam	Prime farmland if irrigated and drained	120.8	18%
Ma	Made land	Not prime farmland	18	3%
Mk	Merritt silty clay loam	Prime farmland if irrigated and drained	108.4	16%
Mn	Merritt silty clay loam, deep	Prime farmland if irrigated and drained	59.9	9%
Mp	Merritt complex, saline-alkali	Farmland of statewide importance	11.8	2%
Rk	Riz loam	Not prime farmland	0	0%
Sa	Sacramento silty clay loam	Prime farmland if irrigated and drained	54.3	8%
So	Sycamore silt loam	Prime farmland if irrigated	59.3	9%

		and drained		
Tb	Tyndall very fine sandy loam	Prime farmland if irrigated and drained	23.2	3%
Te	Tyndall very fine sandy loam, deep	Prime farmland if irrigated and drained	21	3%
Vb	Valdez silt loam, deep	Prime farmland if irrigated and drained	58.4	9%
W	Water	Not prime farmland	2.5	0%
Wa	Willows silty clay loam	Farmland of statewide importance	0.4	0%
Yb	Yolo silty clay loam	Prime farmland if irrigated	0	0%
		Total:	672.8	100%
	Prime Farmland Total:	0	0%	

NRCS Natural Resources Conservation Service

DELTA PROTECTION ZONES

Date: 3/18/2013

Southport Sacramento River Early Implementation Report

Customer(s): ARMY CORPS OF ENGINEERS

District: YOLO COUNTY RESOURCE CONSERVATION DISTRICT

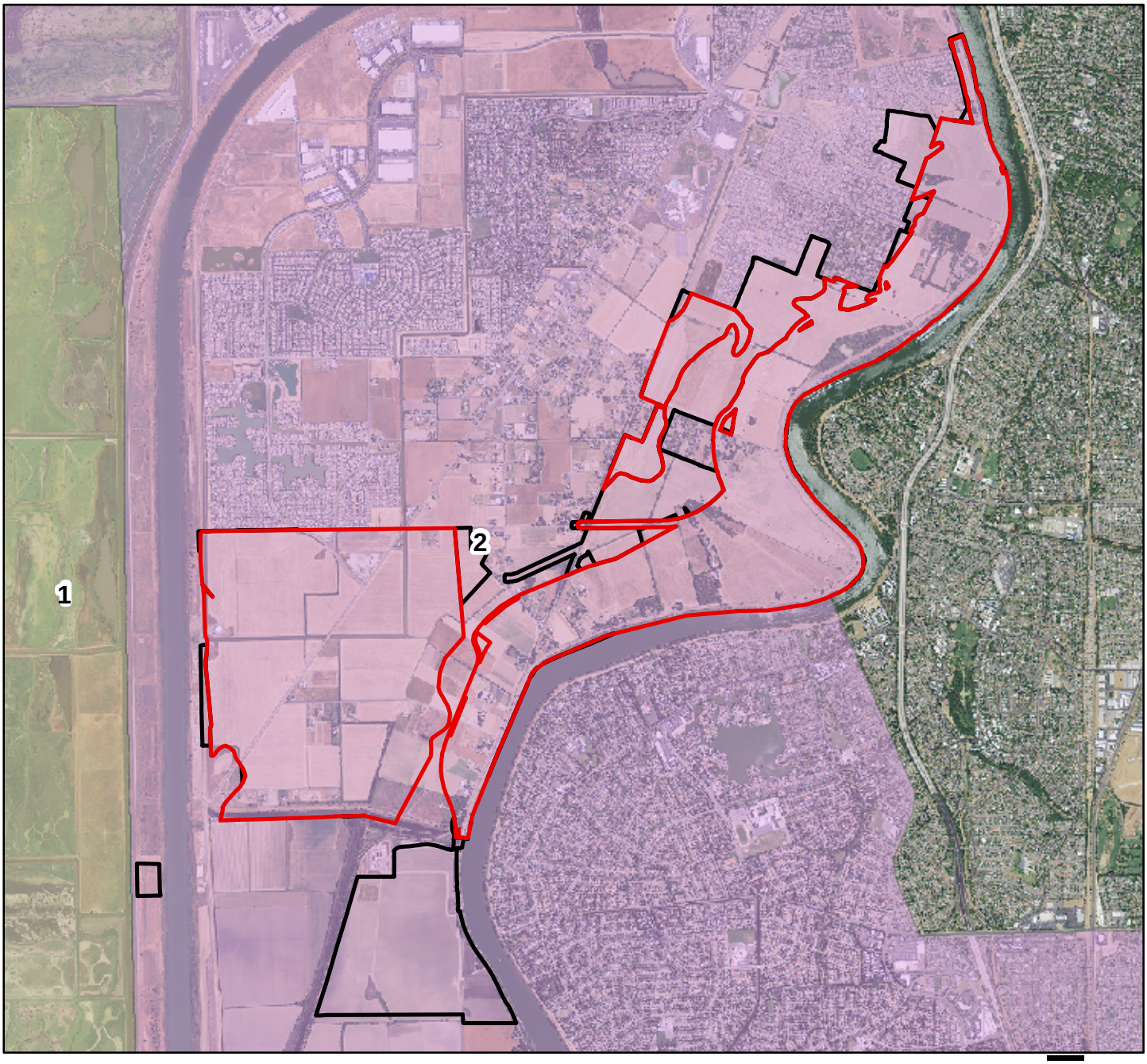
Approximate Acres: 2765.3
ORIGINAL AND SUPPLEMENTAL STUDY AREA

Field Office: WOODLAND SERVICE CENTER

Agency: USDA Natural Resources Conservation Service

Assisted By: PHIL HOGAN

State and County: CA, YOLO



2,100 0 2,100 4,200 6,300 8,400 Feet

Legend

Original Study Area

Supplemental Study Area

Delta Zones

ZONE

2

1

NRCS Natural Resources Conservation Service

IMPORTANT FARMLANDS MAP

Date: 3/18/2013

Southport Sacramento River Early Implementation Report

Customer(s): ARMY CORPS OF ENGINEERS

District: YOLO COUNTY RESOURCE CONSERVATION DISTRICT

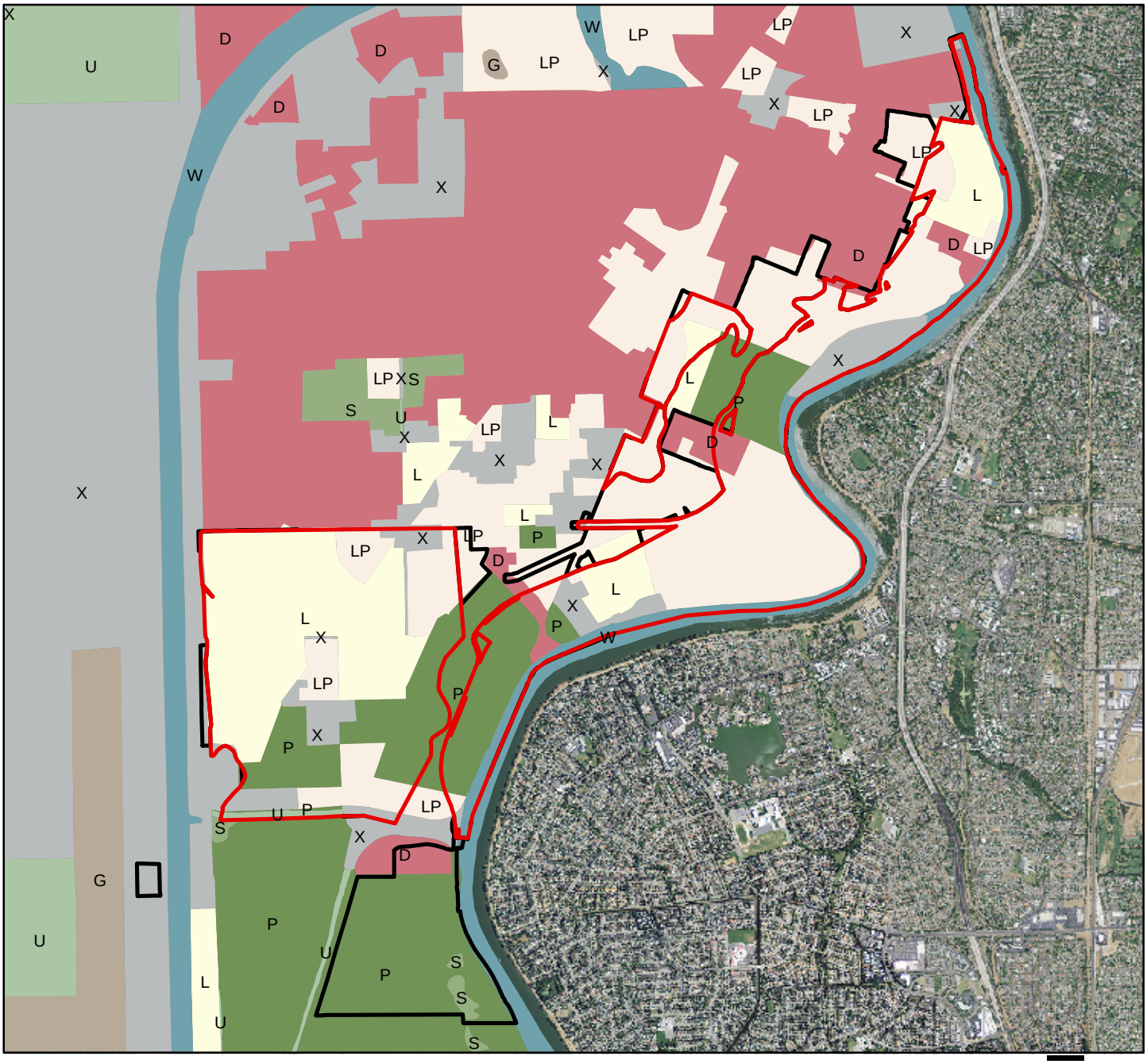
Approximate Acres: 2765.3
ORIGINAL AND SUPPLEMENTAL STUDY AREA

Field Office: WOODLAND SERVICE CENTER

Agency: USDA Natural Resources Conservation Service

Assisted By: PHIL HOGAN

State and County: CA, YOLO



2,000 0 2,000 4,000 6,000 8,000 Feet

Legend

- Original Study Area
- Supplemental Study Area
- Prime Farmland
- Farmland of Statewide Importance
- Unique Farmland
- Farmland of Local Importance
- Grazing Land
- Urban and Built-Up Land
- Other Land
- Water
- Farmland of Local Potential
- Irrigated Farmland
- Nonirrigated Farmland
- Not Surveyed

DATA:
CA Depart. of Conservation
Division of Land Resource Protection
Farmland Mapping & Monitoring Program

NRCS Natural Resources Conservation Service

SOILS MAP

Date: 3/18/2013

Southport Sacramento River Early Implementation Report

Customer(s): ARMY CORPS OF ENGINEERS

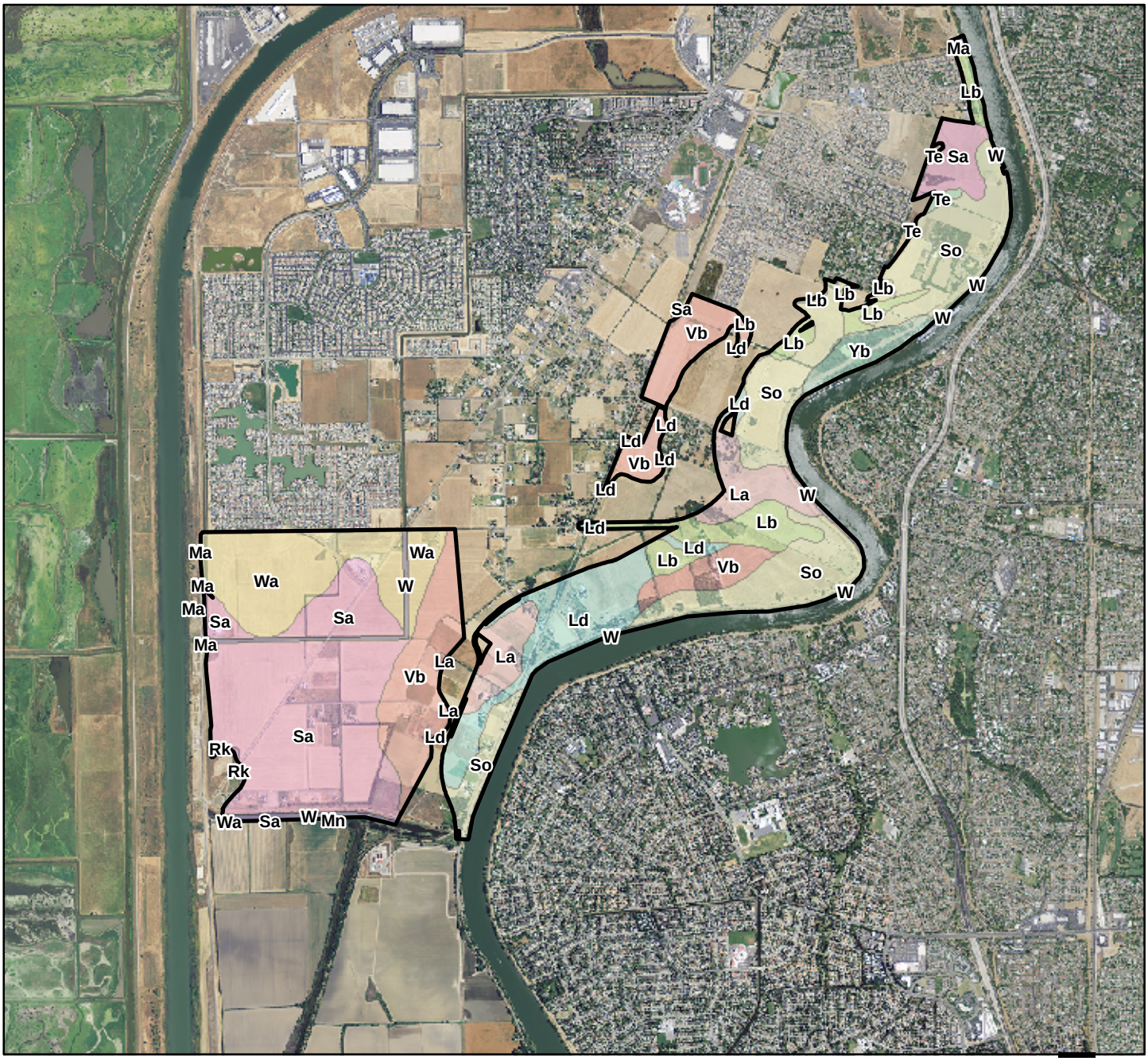
District: YOLO COUNTY RESOURCE CONSERVATION DISTRICT

Approximate Acres: 2092.5
ORIGINAL STUDY AREA

Field Office: WOODLAND SERVICE CENTER
Agency: USDA Natural Resources Conservation Service

Assisted By: PHIL HOGAN

State and County: CA, YOLO



1,900 0 1,900 3,800 5,700 7,600 Feet

Legend

Original Study Area

Soils Map

musym, muname

- La, Lang sandy loam
- Lb, Lang sandy loam, deep
- Ld, Lang silt loam
- Ma, Made land
- Mn, Merritt silty clay loam, deep
- Rk, Riz loam
- Sa, Sacramento silty clay loam
- So, Sycamore silt loam
- Te, Tyndall very fine sandy loam, deep
- Vb, Valdez silt loam, deep
- W, Water
- Wa, Willows silty clay loam
- Yb, Yolo silty clay loam

NRCS Natural Resources Conservation Service

SOILS MAP

Date: 3/18/2013

Southport Sacramento River Early Implementation Report

Customer(s): ARMY CORPS OF ENGINEERS

District: YOLO COUNTY RESOURCE CONSERVATION DISTRICT

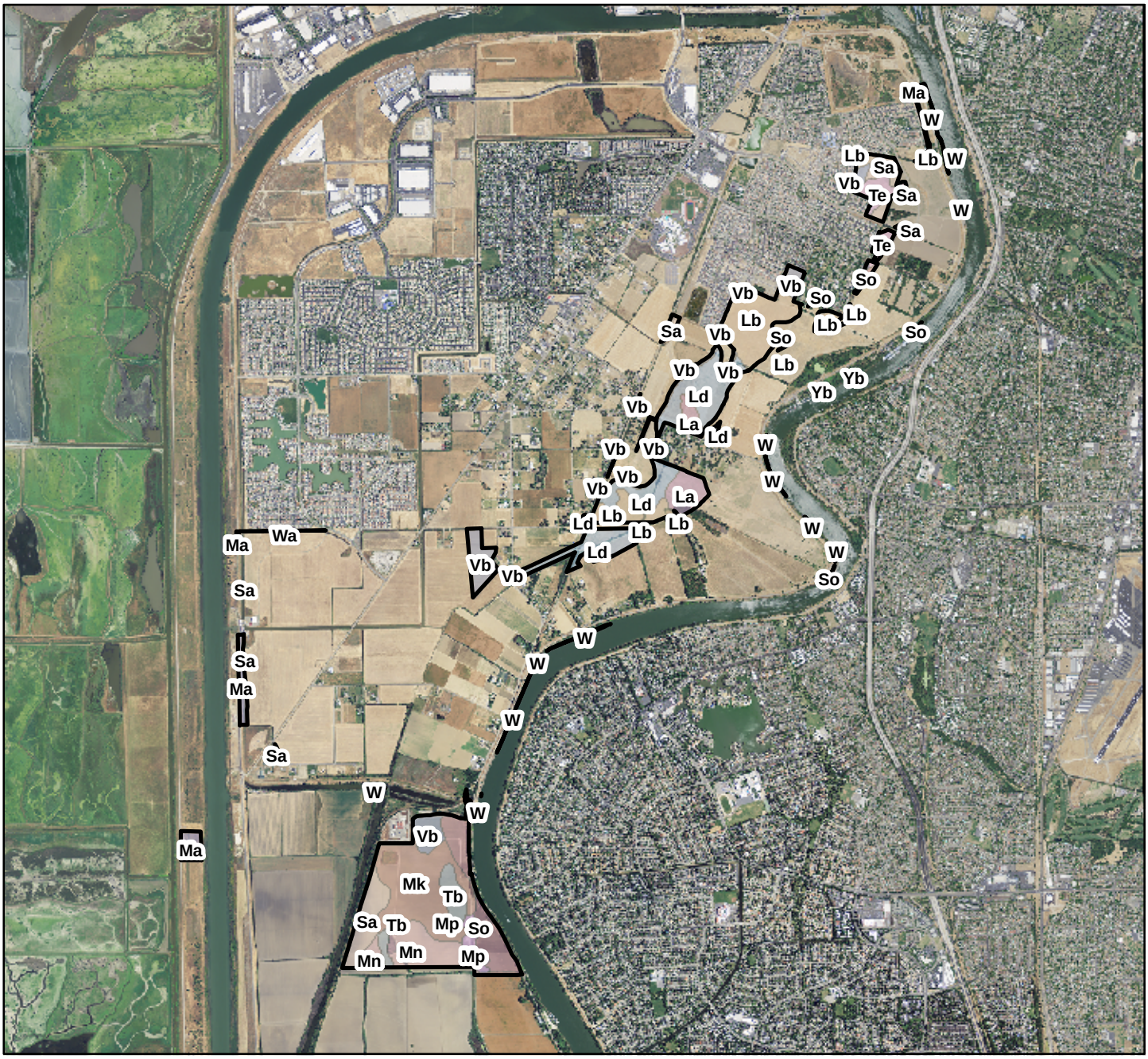
Approximate Acres: 672.8
SUPPLEMENTAL STUDY AREA

Field Office: WOODLAND SERVICE CENTER

Agency: USDA Natural Resources Conservation Service

Assisted By: PHIL HOGAN

State and County: CA, YOLO



2,200 0 2,200 4,400 6,600 8,800 Feet

Legend

Supplemental Study Area

Soils Map

musym, muname

- La, Lang sandy loam
- Lb, Lang sandy loam, deep
- Ld, Lang silt loam
- Ma, Made land
- Mk, Merritt silty clay loam
- Mn, Merritt silty clay loam, deep
- Mp, Merritt complex, saline-alkali
- Rk, Riz loam
- Sa, Sacramento silty clay loam
- So, Sycamore silt loam
- Tb, Tyndall very fine sandy loam
- Te, Tyndall very fine sandy loam, deep
- Vb, Valdez silt loam, deep
- W, Water
- Wa, Willows silty clay loam
- Yb, Yolo silty clay loam

NRCS Natural Resources Conservation Service

PROTECTED SPECIES

Date: 3/18/2013

Southport Sacramento River Early Implementation Report

Customer(s): ARMY CORPS OF ENGINEERS

District: YOLO COUNTY RESOURCE CONSERVATION DISTRICT

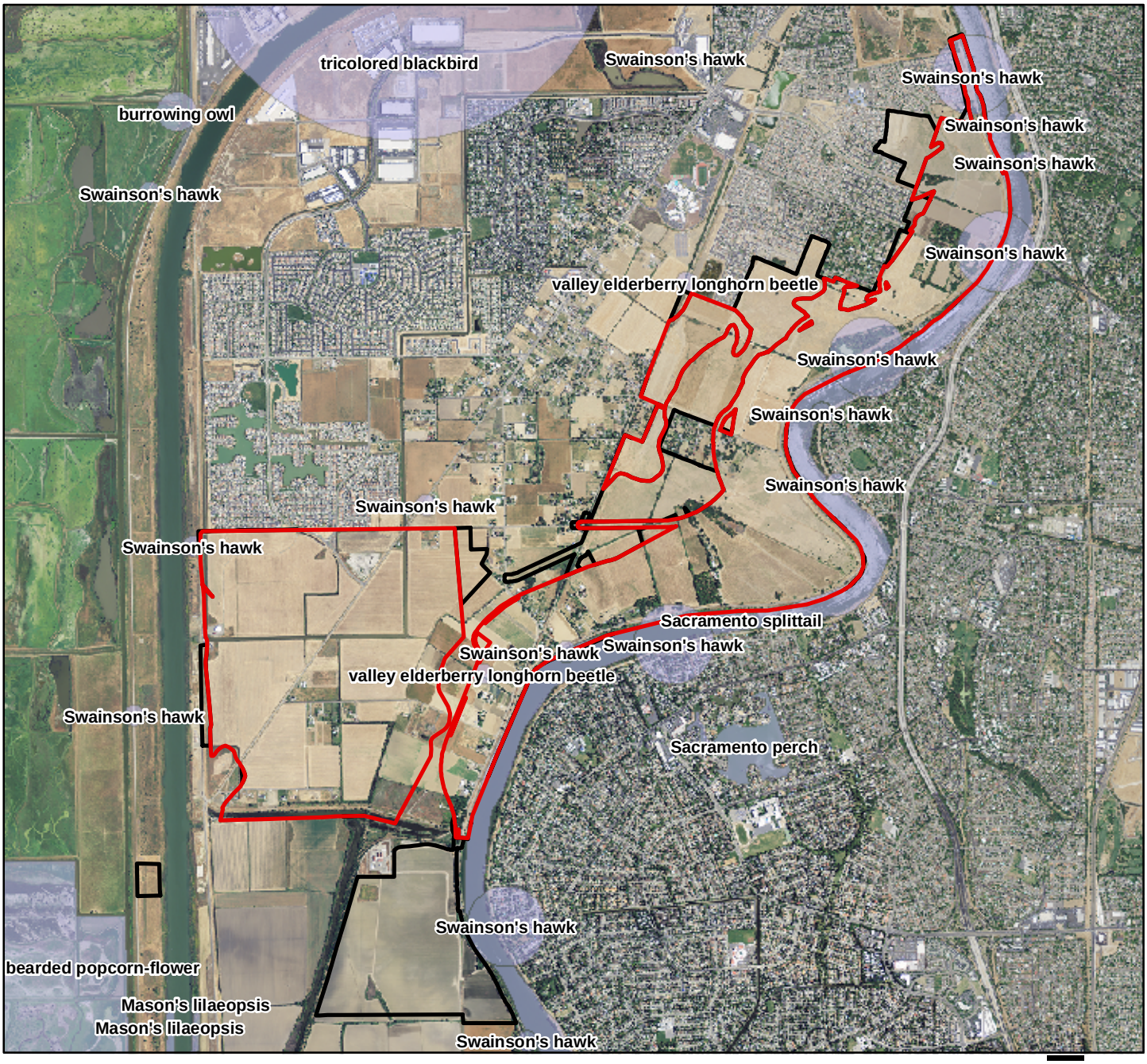
Approximate Acres: 2765.3
ORIGINAL AND SUPPLEMENTAL STUDY AREA

Field Office: WOODLAND SERVICE CENTER

Agency: USDA Natural Resources Conservation Service

Assisted By: PHIL HOGAN

State and County: CA, YOLO



2,200 0 2,200 4,400 6,600 8,800 Feet

Legend

- Original Study Area
- Supplemental Study Area
- <all other values>

DATA:
CA Depart. of Conservation
CA Department of Fish and Wildlife
California Natural Diversity Database

NRCS Natural Resources Conservation Service

USDA LAND CAPABILITY CLASS

Date: 3/18/2013

Southport Sacramento River Early Implementation Report

Customer(s): ARMY CORPS OF ENGINEERS

District: YOLO COUNTY RESOURCE CONSERVATION DISTRICT

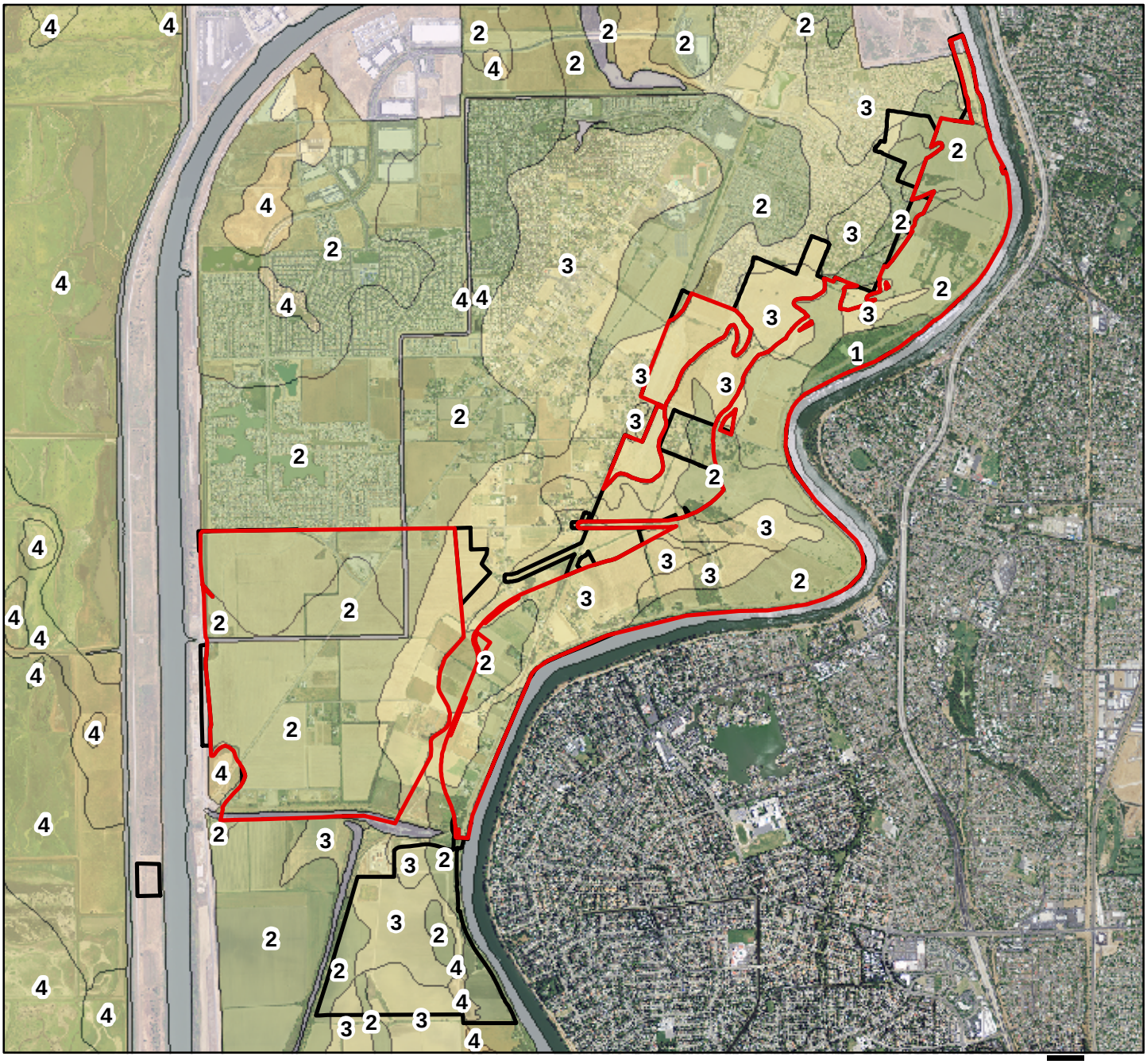
Approximate Acres: 2765.3
ORIGINAL AND SUPPLEMENTAL STUDY AREA

Field Office: WOODLAND SERVICE CENTER

Agency: USDA Natural Resources Conservation Service

Assisted By: PHIL HOGAN

State and County: CA, YOLO



2,300 0 2,300 4,600 6,900 9,200 Feet

Legend

- Original Study Area
- Supplemental Study Area

Irrigated Capability Class

- Capability Class - I
- Capability Class - II
- Capability Class - III
- Capability Class - IV
- Capability Class - V
- Capability Class - VI
- Capability Class - VII
- Capability Class - VIII
- Not rated or not available

DATA: USDA NRCS

From: Armstrong. Robert (SDA) [mailto:armstrongro@sacsewer.com]
Sent: Wednesday, April 03, 2013 05:27 PM
To: Smith, Megan
Subject: Southport EIP NOP/EIR - SRCSD Response

Good Afternoon Megan,

Please find the attached response letter from SRCSD in regards to the above-mentioned project; a hard copy of the letter will be mailed to your attention.

Best Regards,

Robb

Robb Armstrong
Policy & Planning - SRCSD Development Services
Sacramento Regional County Sanitation District
10060 Goethe Road
Sacramento, CA 95827
Phone: (916) 876-6104
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Main Office
10060 Goethe Road
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Tele: [916] 876-6000
Fax: [916] 876-6160

Sacramento Regional Wastewater Treatment Plant
8521 Laguna Station Road
Elk Grove, CA 95758-9550
Tele: [916] 875-9000
Fax: [916] 875-9068

Board of Directors
Representing:

County of Sacramento
County of Yolo
City of Citrus Heights
City of Elk Grove
City of Folsom
City of Rancho Cordova
City of Sacramento
City of West Sacramento

Stan Dean
District Engineer

Ruben Robles
Director of Operations

Prabhakar Somavarapu
Director of Policy & Planning

Karen Stoyanowski
Director of Internal Services

Josepb Maestretti
Chief Financial Officer

Claudia Goss
Public Affairs Manager

technology in balance with nature

April 3, 2013

Ms. Megan Smith
ICF International
630 K Street, Suite 400
Sacramento, CA 95814

Subject: **Supplemental Notice of Preparation (NOP) of an Environmental Impact Statement/Environmental Impact Report for the Southport Sacramento River Early Implementation Program**

Dear Ms. Smith:

Sacramento Regional County Sanitation District (SRCSD) has reviewed the supplemental NOP of an EIS/EIR for the Southport Sacramento River Early Implementation Project (Southport EIP) and has the following comments.

As stated within the NOP, the Southport EIP proposes to implement flood risk-reduction measures along the Sacramento River's South Levee within the City of West Sacramento (City); the proposed project would bring the existing levee up to standard with Federal and state flood protection criteria.

SRCSD has the South River Pump Station (SRPS), 66-inch Yolo Force Main, 120-inch Southport Gravity Sewer and associated easements and access roads located within the proposed projects study area.

SRCSD is currently in the final design stages for the South River Pump Station Flood Protection Project, which will utilize soil from borrow sites of neighboring parcels of the SRPS; close coordination between the West Sacramento Area Flood Control Agency (WSAFCA) and SRCSD should occur in order to avoid any potential conflict in regards to soil acquisition for both projects.

The potential removal and/or addition of ground cover over existing SRCSD facilities may require that SRCSD facilities be raised and/or lowered to meet the finished project grade; load mitigation may also be required for areas where additional loads are placed over SRCSD facilities.

Other areas of concern for SRCSD are as follows:

- All weather access to SRCSD facilities and pipelines for the purpose of operation and maintenance activities pre post construction.
- Improvements proposed to be constructed within existing SRCSD easements that may prohibit the intended use of said easements.
- Potential concerns for any fill placed or removed over SRCSD pipelines.
- Stockpiling or placement of spoils and construction equipment within SRCSD easements.
- Potential construction haul-routes that cross SRCSD pipelines.
- Borrow site excavation in the vicinity of SRCSD pipelines and facilities, including the South River Pump Station Flood Protection Project.
- Coordination of construction activities for the SRCSD South River Pump Station Flood Protection Project and the Southport EIP.
- Borrow site activities located south of the City's South Cross Levee and their relation to the Sacramento River Levee and the potential for increased river seepage.

If you have any questions regarding this letter, please feel free to contact me at (916) 876-6104 or by e-mail at armstrongro@sacsewer.com.

Sincerely,

Robb Armstrong
Sacramento Regional County Sanitation District

R.Ara (ra)

cc: Sharon Sargeant – SRCSD
Scott Mueller – SRCSD
Kyle Frazier – SRCSD

The Southport Sacramento River Early Implementation Project Supplemental Scoping

Comment Card

WSAFCA West Sacramento Area Flood Control Agency

US Army Corps of Engineers Sacramento District

Name: Steve + Pam Gould Date:

Telephone: 372-4042 Email: pamelagould@myway.com

Affiliation: Title (if applicable):

Street Address: 4395 Gregory Ave.

City: W. Sacto State: CA Zip: 95691

Thank you for your interest in this flood risk-reduction effort. The West Sacramento Area Flood Control Agency and the U.S. Army Corps of Engineers value your input regarding this Early Implementation Project. Please provide us with your comments regarding the scope of the Environmental Impact Statement/ Environmental Impact Report being prepared for this project. Please write in the space below legibly.

For your convenience, you may take this self-addressed card home, fill it out, and fold it in half and mail it. You may also send comments via email to Megan Smith at *megan.smith@icfi.com* or Tanis Toland at *tanis.j.toland@usace.army.mil*. **All comments must be received or postmarked by April 8, 2013**.

- Megan Smith, ICF International, 630 K Street, Suite 400, Sacramento, CA 95814
- Tanis Toland, U.S. Army Corps of Engineers, Sacramento District, Delta Programs Integration & Ecosystem Restoration, 1325 J Street Sacramento, CA 95814

Environmental Concerns:

1. Dirt/Dust/Air Quality
2. Vibration from any trucks, equipment, etc.
3. Damage to concrete, pool and/or house
4. Water quality due to well existing
5. Livestock and/or pets
6. Noise
7. Traffic from construction project
8. Houes of construction/weekdays/weekends

The Southport Sacramento River Early Implementation Project Supplemental Scoping

WSAFCA West Sacramento Area Flood Control Agency

US Army Corps of Engineers Sacramento District

Comment Card

Name: Sandra Winter Date: 3/28/13

Telephone: 916-681-3634 Email: julkev@aol.com

Affiliation: Title (if applicable):

Street Address: 8791 Silverberry Ave

City: Elk Grove State: CA Zip: 95624

Thank you for your interest in this flood risk-reduction effort. The West Sacramento Area Flood Control Agency and the U.S. Army Corps of Engineers value your input regarding this Early Implementation Project. Please provide us with your comments regarding the scope of the Environmental Impact Statement/ Environmental Impact Report being prepared for this project. Please write in the space below legibly.

For your convenience, you may take this self-addressed card home, fill it out, and fold it in half and mail it. You may also send comments via email to Megan Smith at *megan.smith@icfi.com* or Tanis Toland at *tanis.j.toland@usace.army.mil*. **All comments must be received or postmarked by April 8, 2013**.

- Megan Smith, ICF International, 630 K Street, Suite 400, Sacramento, CA 95814
- Tanis Toland, U.S. Army Corps of Engineers, Sacramento District, Delta Programs Integration & Ecosystem Restoration, 1325 J Street Sacramento, CA 95814

Actual property concern is at 2055 Davis Rd

Will this project have ~~any~~ an effect

on the ground water level & thus the

well at 2055 Davis Rd. The current

well is not a deep well. Also the

impact on the traffic on Davis Rd,

currently a country road

Appendix C

Flood Management and Geomorphic Conditions Technical Appendix

C.1 MBK Engineers. 2013b. Supplemental Memo: Refined Hydraulic Impact Analysis for the Southport Sacramento River Early Implementation Project Environmental Impact Statement/ Environmental Impact Report. September 9, 2013. Sacramento, CA. Prepared by: Mike Archer, P.E. Prepared for: West Sacramento Flood Control Agency, West Sacramento, CA.

C.2 MBK Engineers. 2013a. Hydraulic Impact Analysis for the Southport Sacramento River Early Implementation Project Environmental Impact Statement/ Environmental Impact Report. July 26, 2013. Sacramento, CA. Prepared by: Mike Archer, P.E. Prepared for: West Sacramento Flood Control Agency, West Sacramento, CA.

C.3 MBK Engineers. 2013c. Southport Sacramento River Early Implementation Project Interim Condition Hydraulic Impact Analysis. September 18, 2013. Sacramento, CA. Prepared by: Mike Archer, P.E. Prepared for: West Sacramento Flood Control Agency, West Sacramento, CA.

C.4 MBK Engineers. 2011a. Hydraulic Impact Analysis. Southport Early Implementation Project. June 29, 2011. Sacramento, CA. Prepared by: Mike Archer, P.E. Prepared for: West Sacramento Flood Control Agency, West Sacramento, CA.

C.5 MBK Engineers. 2011b. Preliminary Existing Condition 2-Dimenstional Hydraulic Simulation Model. Southport Early Implementation Project. December 23, 2011. Sacramento, CA. Prepared by: Mike Archer, P.E. Prepared for: West Sacramento Flood Control Agency, West Sacramento, CA.

C.6 cbec inc., eco engineering. 2013. Memorandum—Average annual inundation duration of the offset's lower floodplain (draft). September 6. Prepared by: John Stofleth, Chris Bowles, and Poyom Riles. Prepared for: Michael Vecchio, HDR Engineering, Sergio Jiminez, HDR Engineering, and Carl Jensen, ICF International. Project Number 12-1001. Southport EIP.

C.7 cbec inc., eco engineering. 2011a. West Sacramento / Southport EIP: Task Order 2: Historic and Current Preliminary Geomorphic Assessment. September 12, 2011. Final Report. Project Number 11-1003. Prepared for: West Sacramento Flood Control Agency and HDR Engineering

C.8 cbec inc., eco engineering. 2011b. Technical Memorandum—Existing Conditions Sediment Transport Assessment. November 7, 2011. Prepared by: John Stofleth, Chris Campbell, and Chris Bowles. Prepared for: Michael Vecchio, HDR Engineering. Project Number 11-1013. West Sacramento Southport EIP Task Order 3.

Appendix C.1

Hydraulic Impact Analysis for the Southport Sacramento River Early Implementation Project Environmental Impact Statement/ Environmental Impact Report— MBK Engineers, July 26, 2013

SUPPLEMENTAL MEMO: REFINED HYDRAULIC IMPACT ANALYSIS FOR THE SOUTHPORT SACRAMENTO RIVER EARLY IMPLEMENTATION PROJECT ENVIRONMENTAL IMPACT STATEMENT/ ENVIRONMENTAL IMPACT REPORT

September 9, 2013

Prepared by: Mike Archer, P.E.

Reviewed by:

1.0 Background

The hydraulic impacts presented in the MBK Engineers (MBK) technical memorandum "Hydraulic Impact Analysis for the Southport Sacramento River Early Implementation Project Environmental Impact Statement/Environmental Impact Report", dated July 31, 2013, are from hydraulic analyses performed with a HEC-RAS 1-dimensional hydraulic model of the Sacramento River watershed (see Figure 1). Three of the five alternatives evaluated in the Environmental Impact Statement/Environmental Impact Report (EIS/EIS) include levee setbacks: Alternatives 2, 4, and 5 (see Figures 2, 3, and 4).

During the preparation of the EIS/EIR, a 2-dimensional (2-D) hydraulic model of the preferred levee setback alternative, Alternative 5 in the EIS/EIR, was developed by MBK and utilized in the risk based hydraulic impact analysis prepared for the U.S. Army Corps of Engineers (USACE) Section 408 permit request. The 2-D model was prepared to better analyze the localized hydraulic response of the levee setback project, but due to the complexity of 2-D hydraulic analysis does not extend far beyond the project site (see Figure 5). Due to the limited coverage of the 2-D model, the 1-D model of the Sacramento River watershed that was used for the EIS/EIR hydraulic analysis was also used to support the Section 408 permit request for the evaluation of regional impacts of the levee setback project. Results of the 2-D model analysis, however, indicated that the 1-D model did not adequately simulate the two-dimensional nature of the levee setback project, with water entering and leaving the offset area through breaches in remnant levees or over degraded remnant levees. Therefore, the 1-D model was "refined" to reproduce the project site localized hydraulic impacts through the process outlined below.

2.0 Purpose

The purpose of this technical memorandum is to supplement the hydraulic impact analysis previously performed with results from a refined 1-D hydraulic impact analysis.

3.0 Refined 1-D Hydraulic Analysis Method

The general concept of the refined 1-D hydraulic analysis is that the 2-D model would be used to determine changes of the preferred alternative in the project reach, within the 2-D model domain, and that the 1-D model would be used to determine changes outside of the 2-D model domain, or region. This allows for the most accurate representation of conditions for determining results.

The Southport EIP project is located 3.2 miles downstream of the confluence of the Sacramento and American Rivers (see Figure 6). If the project were to affect the stage in the Sacramento River downstream of the American River, hydraulic impacts could extend upstream of the American River and downstream of the project site. A reduction in stage would increase the flow in the Sacramento River downstream of the American River.

Due to the complexity of 2-D hydraulic analysis, the 2-D model does not include the Sacramento and American River confluence. The upstream boundary of the 2-D model is located at the I Street gage, 900 feet upstream of the I Street bridge, approximately 0.6 mile downstream of the American River, and 2.6 miles upstream of the project site. The downstream boundary of the 2-D model is located at the Freeport bridge, approximately 5.3 miles downstream of the project site.

The following steps outline the coordination of the 1-D and 2-D models utilized for the refined 1-D hydraulic impact analysis.

1. The 1-D model was used to develop the relationship between change in stage and change in flow in Sacramento River at the upstream boundary of the 2-D model.

2. The 2-D model was iterated by adjusting the upstream input flow in the project condition model until the change in stage and change in flow at its upstream boundary due to the addition of the levee setback matched the relationship determined in Step 1.

3. Adjustments were made to the setback area in the 1-D model, primarily through the use of ineffective flow area designation, until the results of the 1-D model at the I Street gage matched those of the 2-D model from Step 2. Step 3 is the “refinement” of the levee setback area in the 1-D model.

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4.0 Application of Refined 1-D Hydraulic Analysis to EIS/EIR Hydraulic Analysis

The refined 1-D hydraulic analysis evaluated only one levee setback configuration, whereas the EIS/EIR hydraulic analysis evaluated three levee setback configurations. The levee setback evaluated in the refined 1-D analysis was the same as Alternative 5 in the EIS/EIR analysis. Review of the results from the EIS/EIR analysis for the three levee setback alternatives show that the computed effects on the maximum water surface elevation are very similar for all three levee setback alternatives (see Figures 7, 8, and 9). There is very little difference in the computed impacts for Alternatives 2 and 5, therefore the refined 1-D analysis of the impacts of Alternative 5 are also representative of the impacts of Alternative 2. The small (+/- 0.01 ft. to 0.03 ft.) but consistent difference between Alternatives 4 and 5 upstream and downstream of the levee setback are the result of the overestimation of the impacts to the Sacramento River-American River flow split in the EIS/EIR analysis, and therefore would not be applicable to the refined 1-D analysis. The EIS/EIR analysis, however, does show a localized increase in impact in Segment F (between river miles 56 and 57) in Alternatives 2 and 5 that is not present in Alternative 4. This localized impact is also apparent in the 408 analysis (see Figures 10, 11, and 12). It can be concluded that the computed impacts from the 408 analysis are representative of the impacts of Alternative 4 with the exception of the localized impact shown between river miles 56 and 57, where the impact should be closer to zero.

The refined 1-D hydraulic impact analysis assumed that the Folsom Joint Federal Project (JFP) was in place. Modeling results from the EIS/EIR analysis indicate that results are nearly identical for the with- and without- JFP conditions. As such, for the refined 1-D analysis, we can also assume that the results would be nearly identical for the with- and without-JFP conditions.

A summary comparison of the computed impacts of Alternative 5 from the EIS/EIR analysis and the refined 1-D analysis is provided in Table 1.

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Table 1. Comparison of Computed Maximum Water Surface Elevations							
		NEPA/CEQA (1-D)			408 (1-D & 2-D)		
		Maximum Water Surface Elevation (ft NAVD88)			Maximum Water Surface Elevation (ft NAVD88)		
Location	Comp Study River Mile	Without Setback [1] (with JFP)	With Setback [2] (with JFP)	**Change (ft)**	Without Setback [3] (with JFP)	With Setback [3] (with JFP)	**Change (ft)**
100-yr							
SR4 (I Street)	59.6915	34.39	34.35	**-0.04**	34.41	34.40	**-0.01**
SR5 (u/s end of Project)	57.0026	33.20	33.13	**-0.07**	33.21	33.20	**-0.01**
SR6 (nr Davis Rd.)	54.7464	32.32	32.34	**+0.02**	32.33	32.34	**0**
SR7 (d/s end of Project)	51.7539	30.89	31.03	**+0.14**	30.91	30.92	**+0.01**
SR8 (Babel Slough)	49.9997	30.23	30.36	**+0.13**	30.24	30.26	**+0.01**
SR9 (Freeport Bridge)	46.4268	28.56	28.69	**+0.13**	28.58	28.60	**+0.01**
SR10 (Walnut Grove)	26.7501	17.17	17.22	**+0.05**	17.18	17.19	**0**
Max Change	54.0001	31.83	32.12	**+0.29**	31.32 [4]	31.45 [4]	**+0.13** [4]
200-yr							
SR4 (I Street)	59.6915	36.24	36.20	**-0.04**	36.27	36.28	**+0.01**
SR5 (u/s end of Project)	57.0026	35.02	34.94	**-0.08**	35.04	35.05	**+0.01**
SR6 (nr Davis Rd.)	54.7464	34.11	34.13	**+0.02**	34.14	34.11	**-0.02**
SR7 (d/s end of Project)	51.7539	32.63	32.78	**+0.15**	32.66	32.64	**-0.02**
SR8 (Babel Slough)	49.9997	31.96	32.10	**+0.14**	31.98	31.96	**-0.02**
SR9 (Freeport Bridge)	46.4268	30.21	30.34	**+0.13**	30.23	30.22	**-0.02**
SR10 (Walnut Grove)	26.7501	18.05	18.10	**+0.05**	18.06	18.05	**-0.01**
Max Change	54.0001	33.59	33.91	**+0.32**	33.21 [5]	33.38 [5]	**+0.17** [5]
500-yr							
SR4 (I Street)	59.6915	38.51	38.43	**-0.08**	38.39	38.40	**+0.02**
SR5 (u/s end of Project)	57.0026	37.11	36.98	**-0.13**	37.02	37.06	**+0.04**
SR6 (nr Davis Rd.)	54.7464	36.06	36.04	**-0.02**	35.97	35.94	**-0.03**
SR7 (d/s end of Project)	51.7539	34.31	34.42	**+0.11**	34.24	34.20	**-0.04**
SR8 (Babel Slough)	49.9997	33.58	33.67	**+0.09**	33.52	33.48	**-0.04**
SR9 (Freeport Bridge)	46.4268	31.63	31.70	**+0.07**	31.58	31.55	**-0.03**
SR10 (Walnut Grove)	26.7501	18.85	18.88	**+0.03**	18.90	18.90	**-0.01**
Max Change	54.0001	35.43	35.79	**+0.36**	35.49 [6]	35.76 [6]	**+0.27** [6]

1 Scenario: "No Action (Future without Setback)". Includes Folsom Joint Federal Project (JFP) and 200-year urban levees.
2 Scenario: "Future with Alt. 5". Includes Folsom JFP and 200-year urban levees.
3 Includes Folsom JFP, 200-year urban levees, and 1957 profile levee raises.
4 Max change from 408 analysis is at RM 53.66.
5 Max change from 408 analysis is at RM 53.87.
6 Max change from 408 analysis is at RM 54.07.

5.0 Conclusion

The changes in stage of the Southport EIP preferred alternative (Alternative 5) computed for the refined 1-D hydraulic analysis are representative of the expected impacts of Alternative 2. They are also representative of the expected impacts of Alternative 4 with the exception of the localized impact between river miles 56 and 57. This localized impact, which is due to the

levee setback upstream of Bee's Lake, would not be expected to occur in Alternative 4 since the levee setback upstream of Bee's Lake is not included in Alternative 4.

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FIGURES

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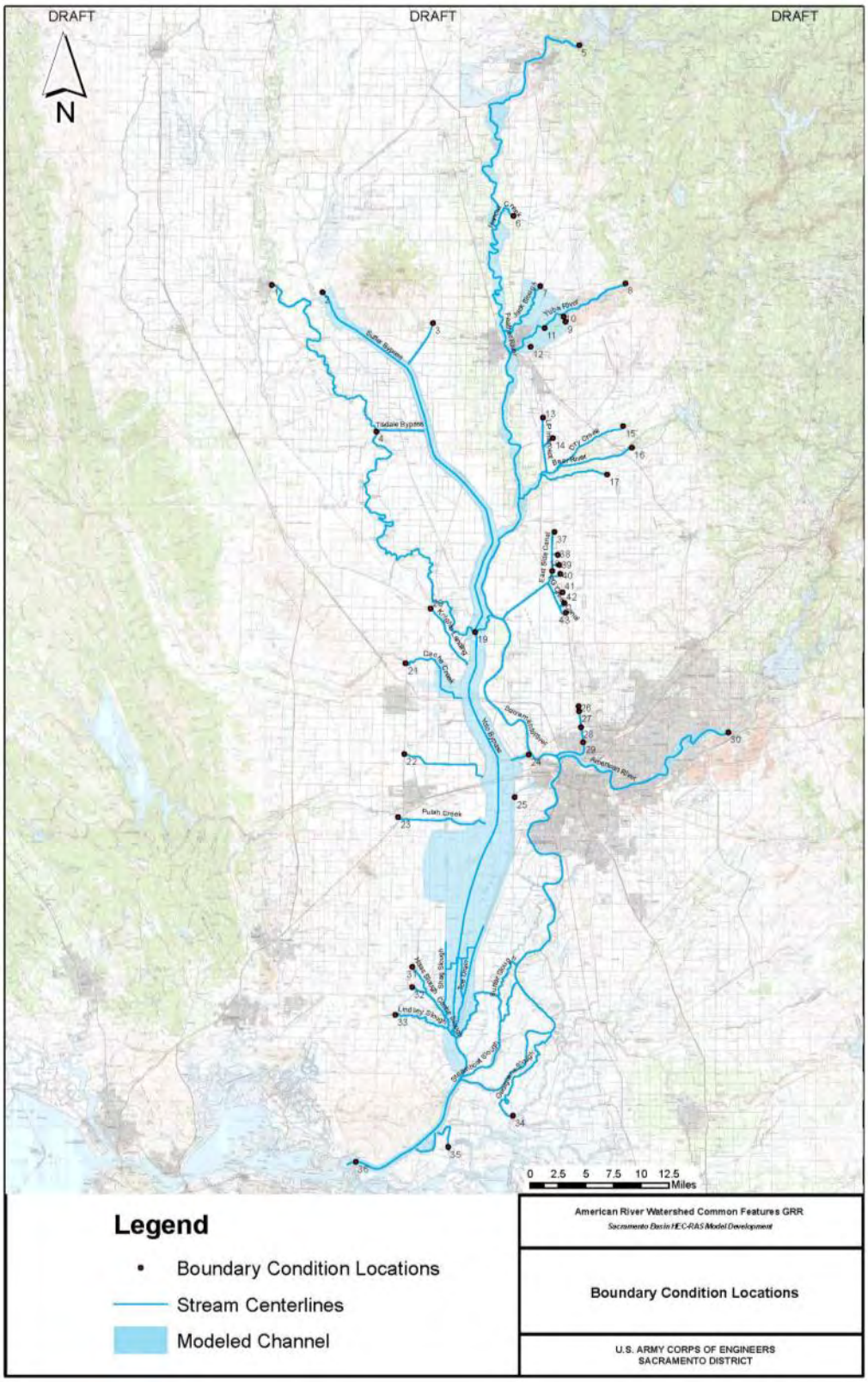

Figure 1. USACE Sacramento River 1-D HEC-RAS Model Extents (Source: USACE)

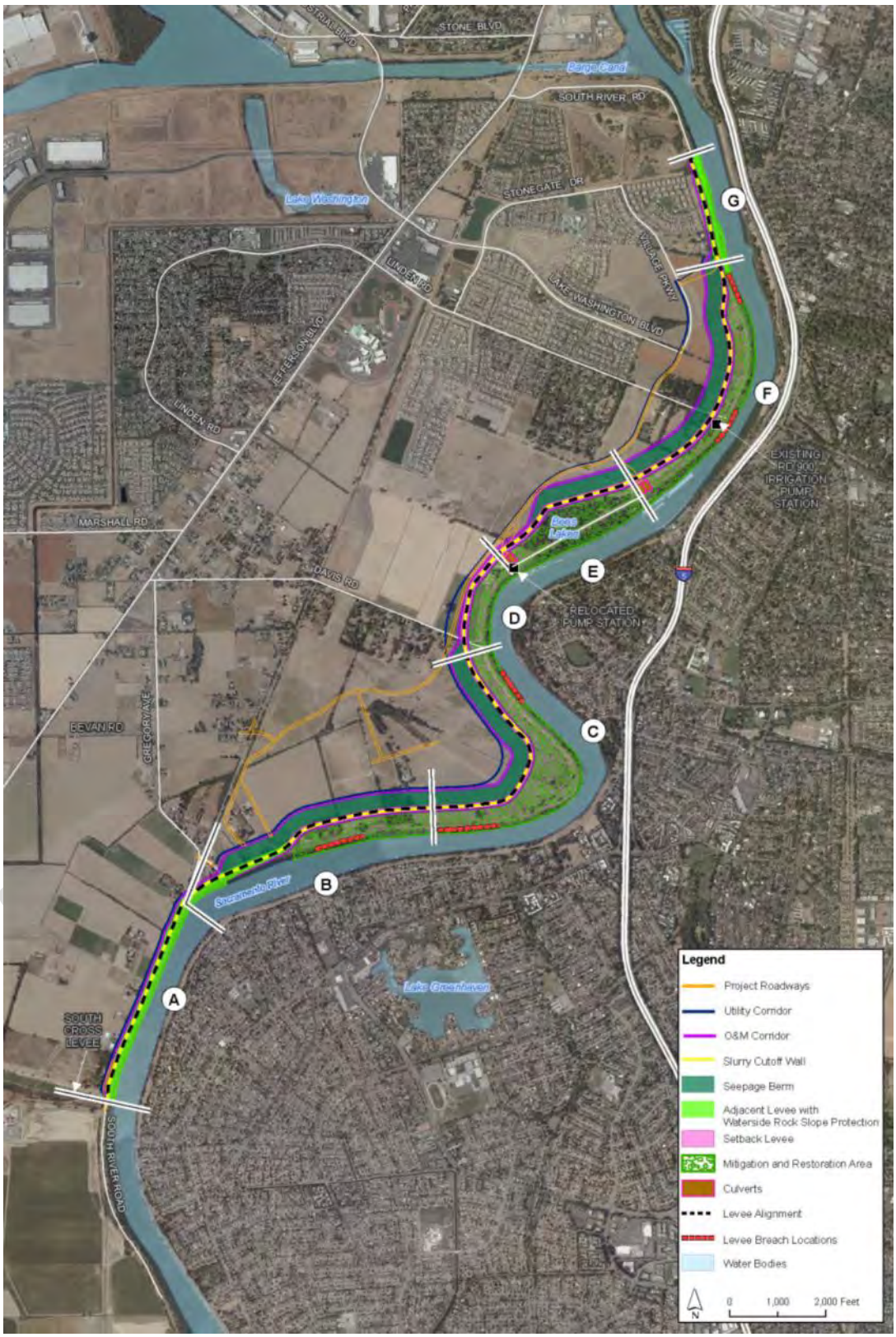

Figure 2. With Project, Alternative 2 (Source: ICF International)

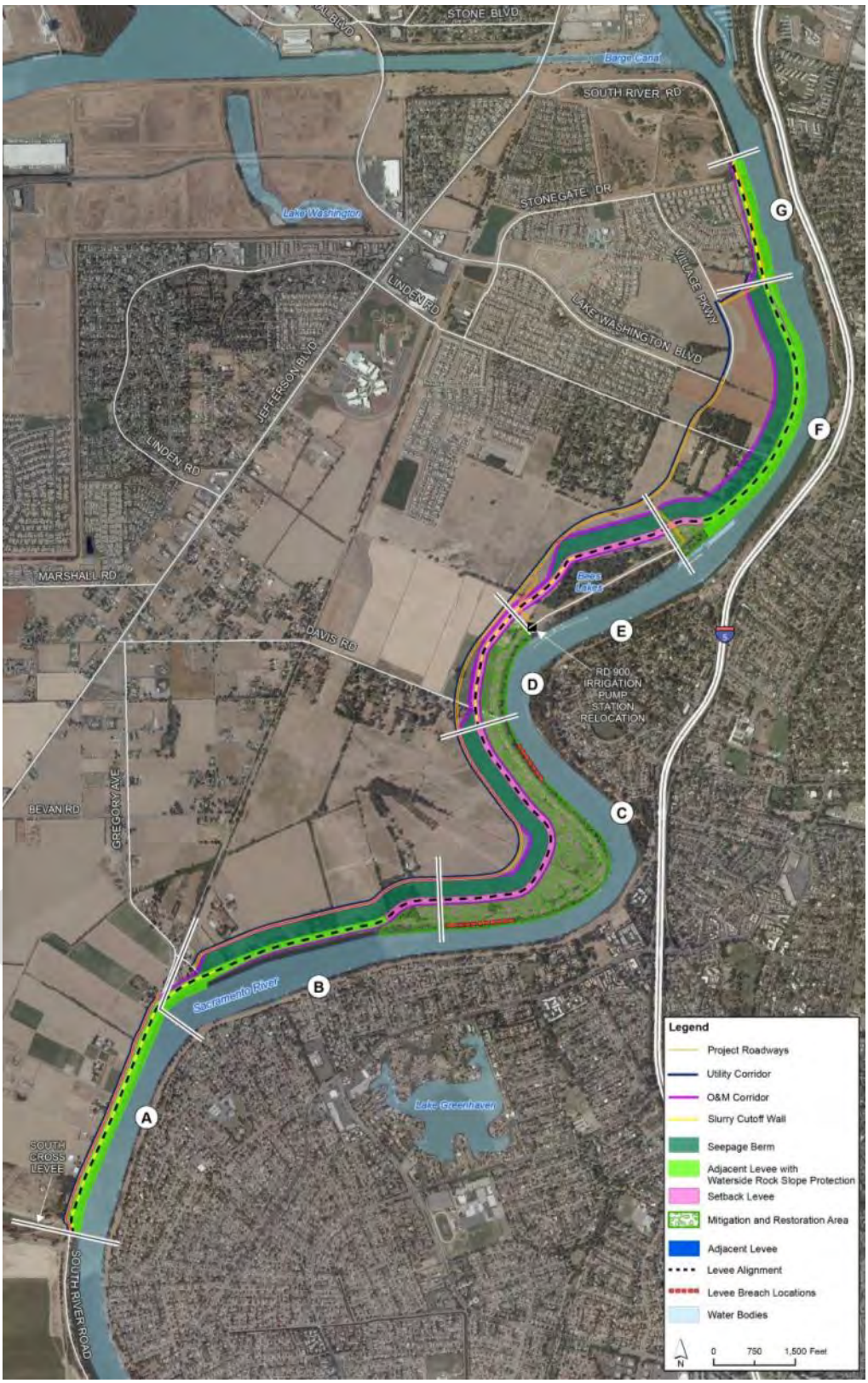

Figure 3. With Project, Alternative 4 (Source: ICF International)

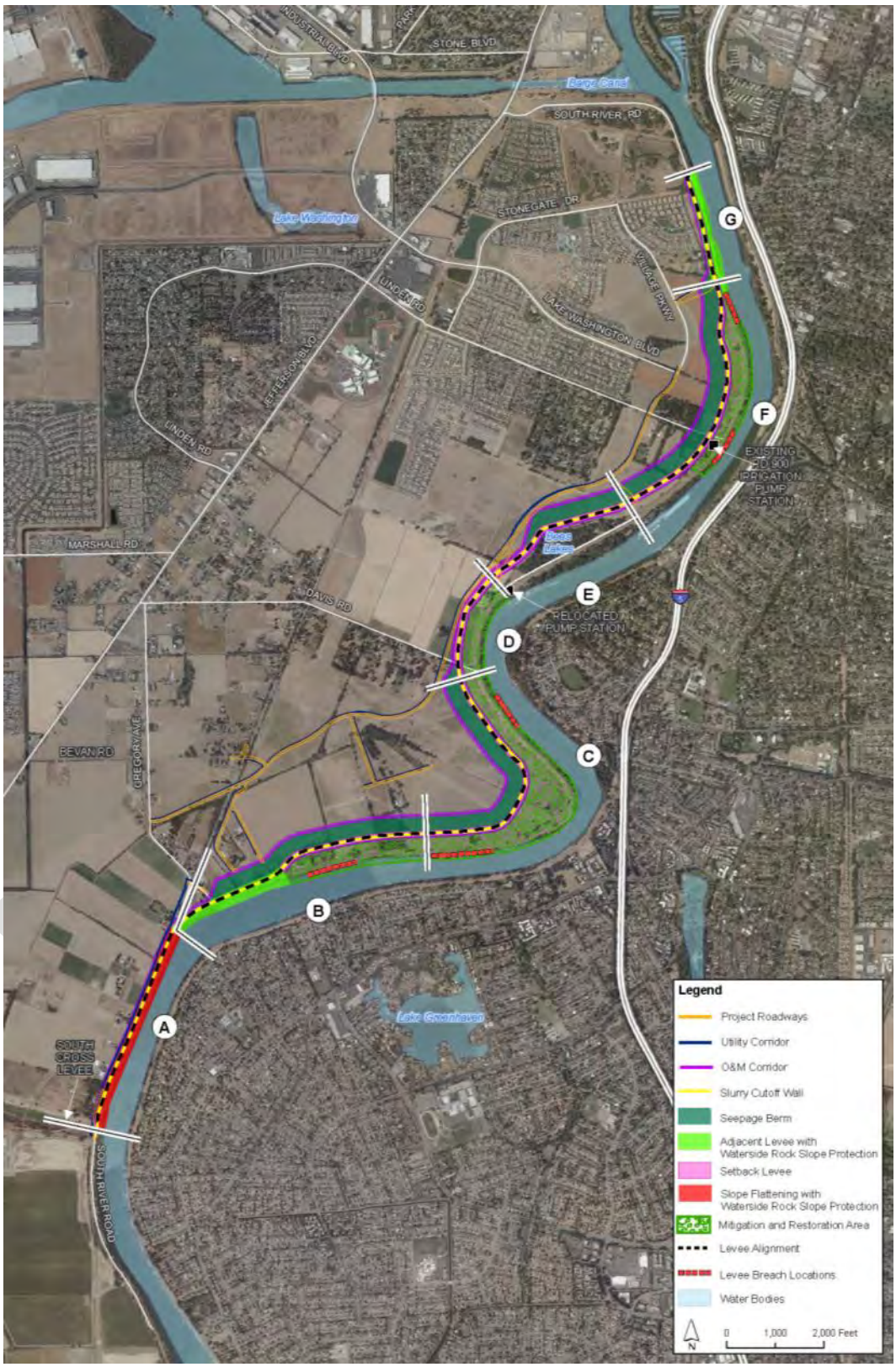

Figure 4. With Project, Alternative 5 (Source: ICF International)

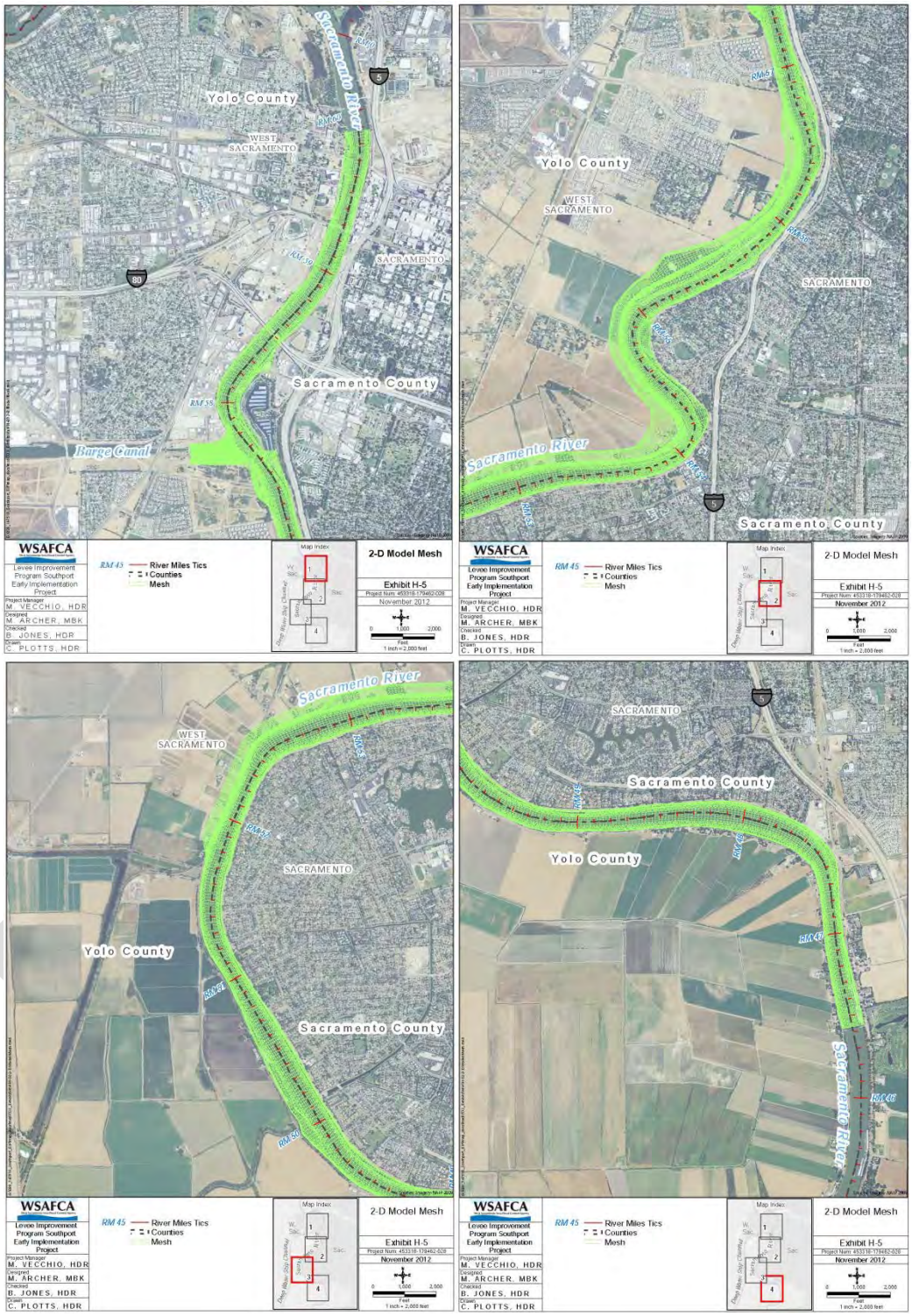

Figure 5. 2-D Hydraulic Model Extents

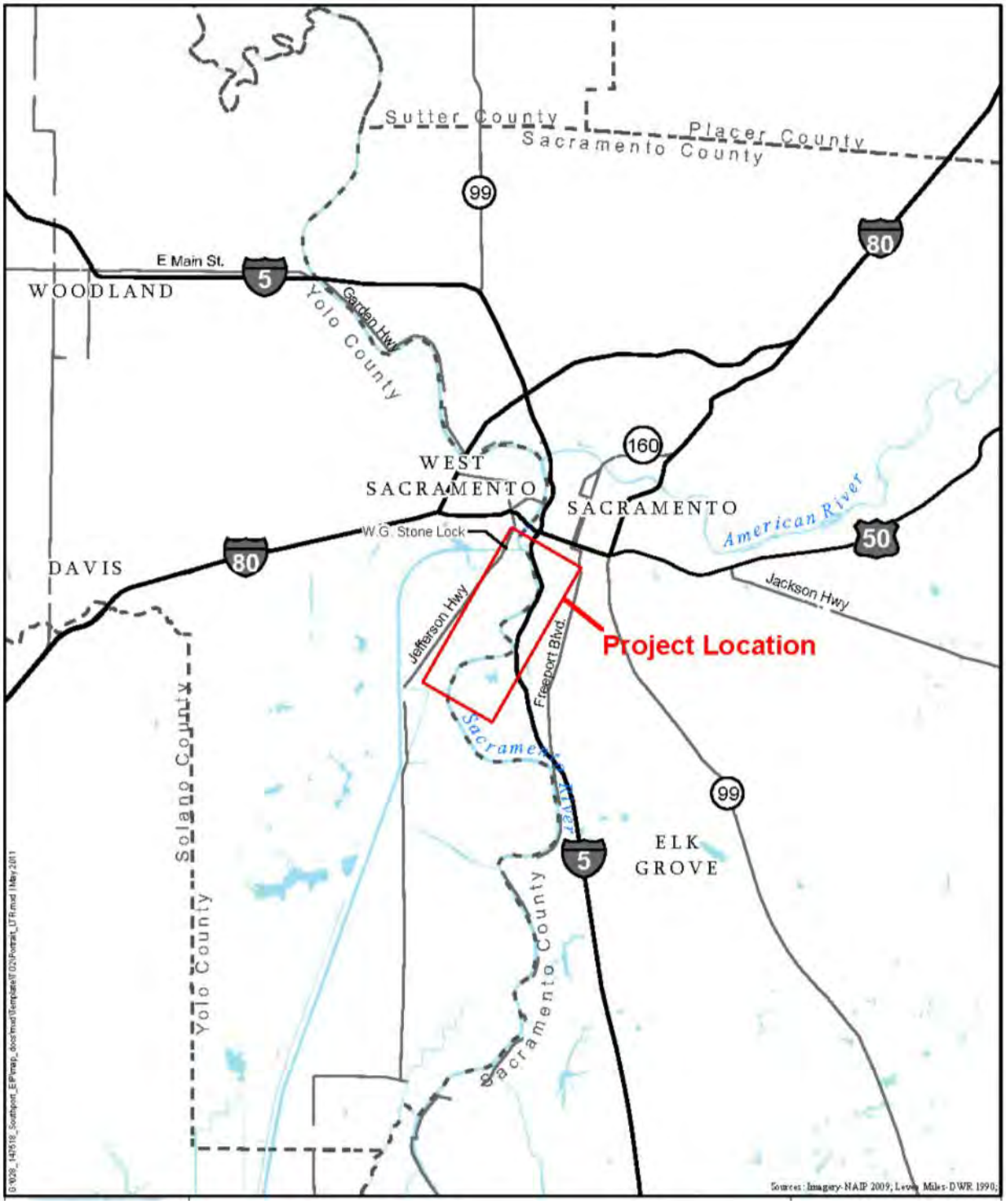

Figure 6. Project Location Map

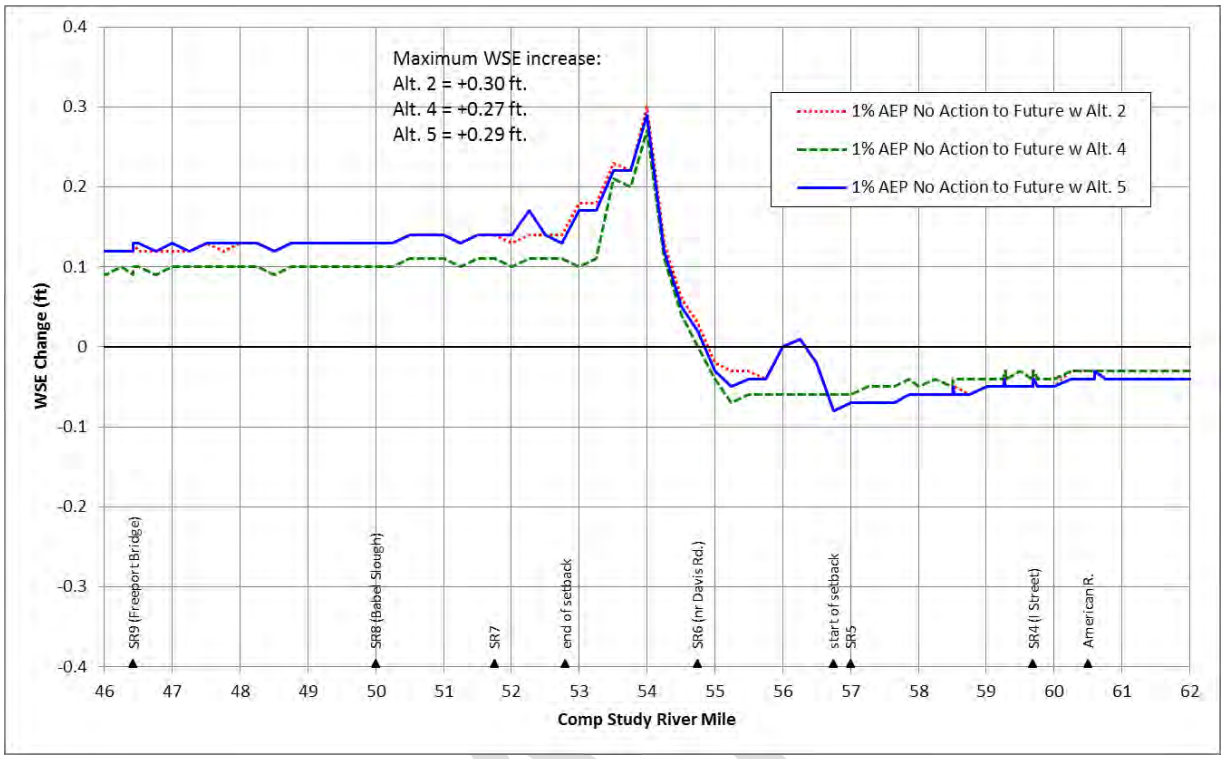

Figure 7. Computed Water Surface Elevation (WSE) change from EIS/EIR hydraulic impact analysis, Alternatives 2, 4, and 5, 1% Annual Exceedance Probability (AEP)

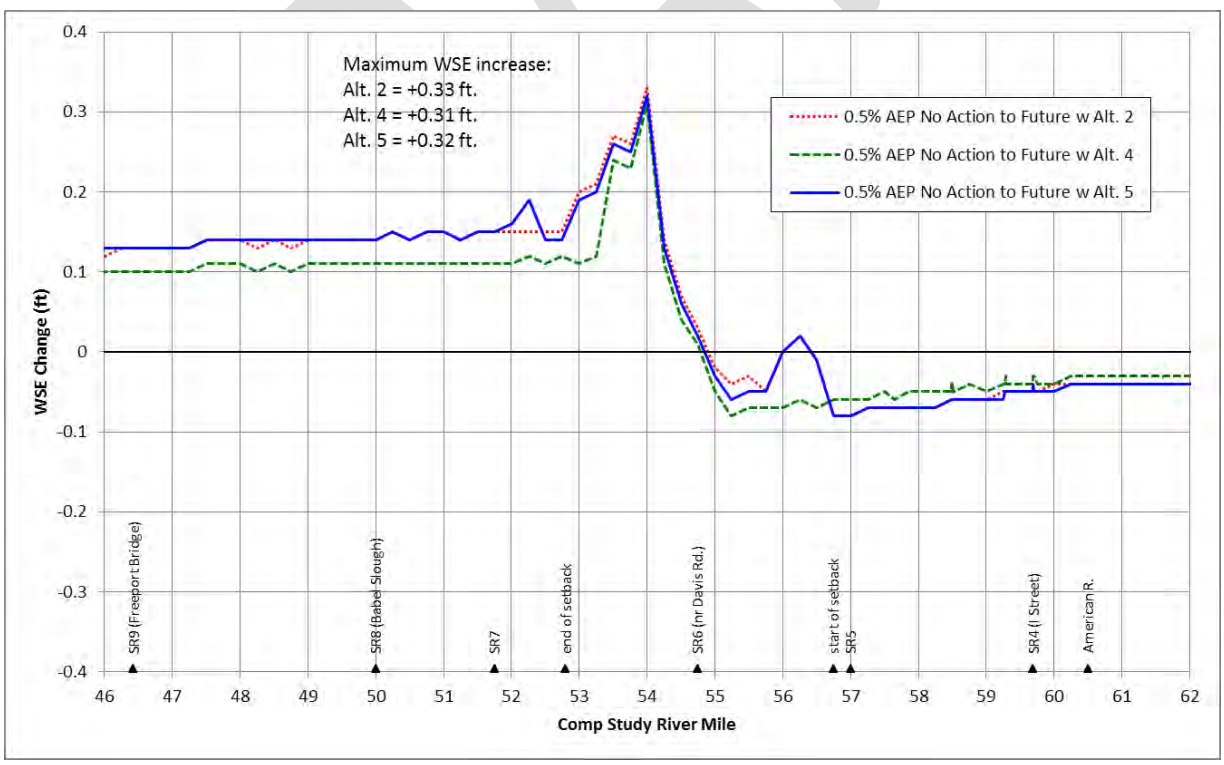

Figure 8. Computed Water Surface Elevation (WSE) change from EIS/EIR hydraulic impact analysis, Alternatives 2, 4, and 5, 0.5% Annual Exceedance Probability (AEP)

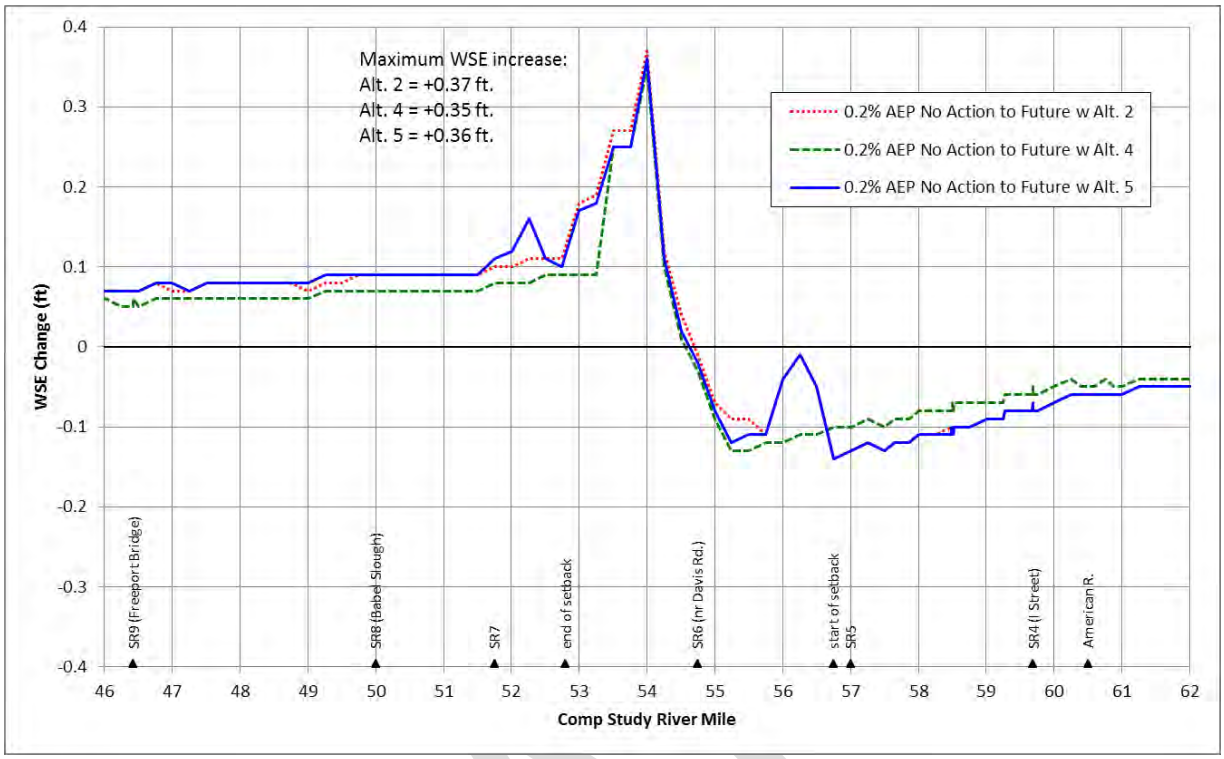

Figure 9. Computed Water Surface Elevation (WSE) change from EIS/EIR hydraulic impact analysis, Alternatives 2, 4, and 5, 0.2% Annual Exceedance Probability (AEP)

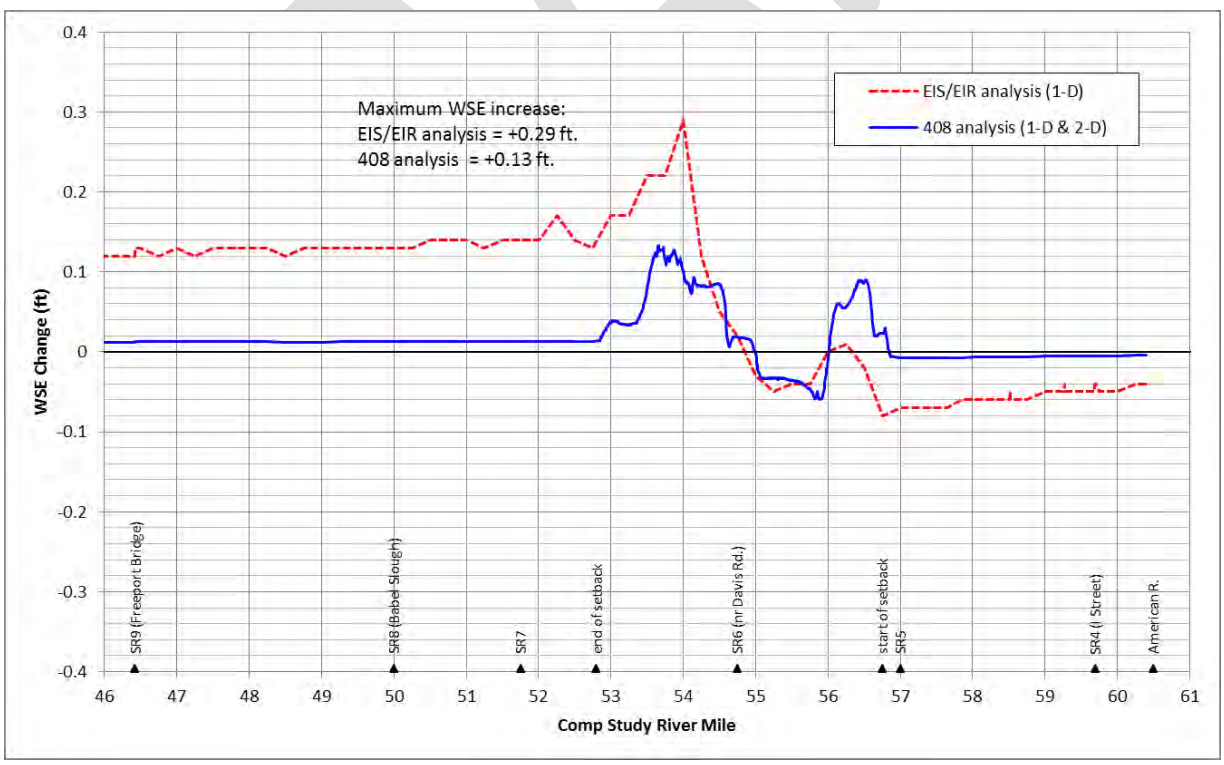

Figure 10. Computed Water Surface Elevation (WSE) change, 408 Analysis and EIS/EIR Analysis; Preferred Alternative (Alternative 5), 1% Annual Exceedance Probability (AEP)

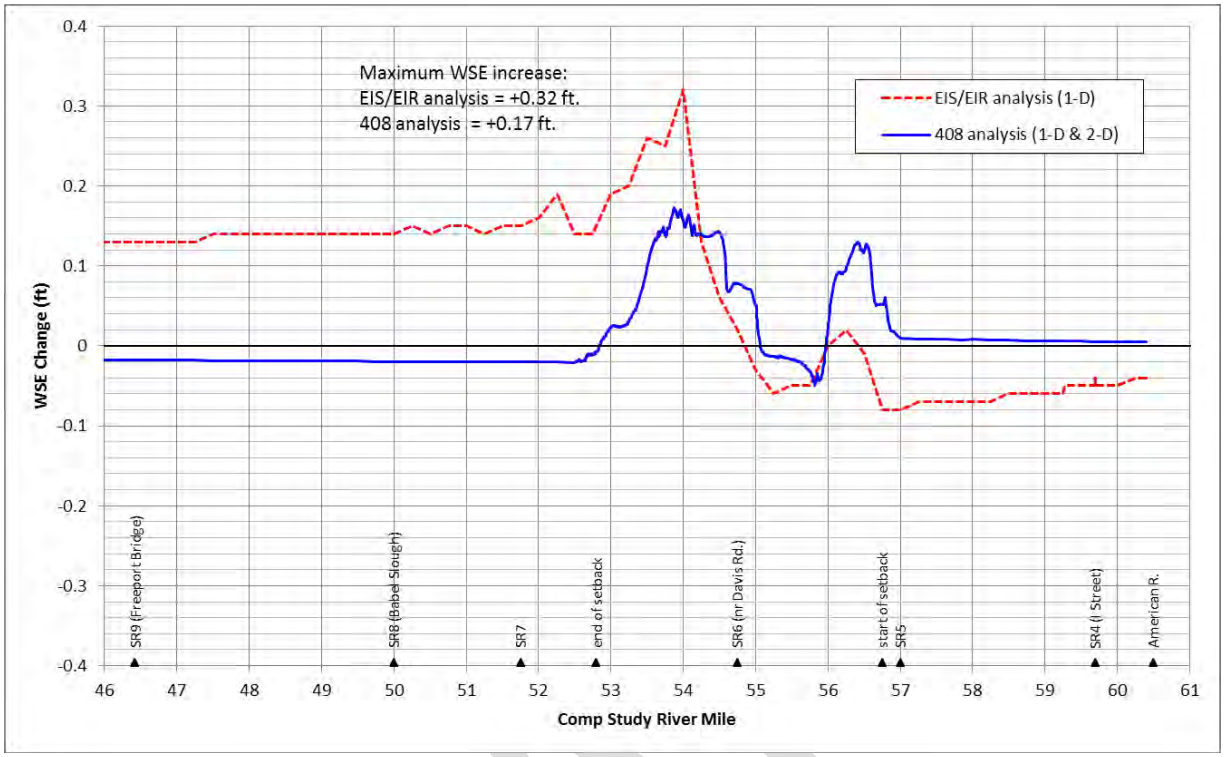

Figure 11. Computed Water Surface Elevation (WSE) change, 408 Analysis and EIS/EIR Analysis; Preferred Alternative (Alternative 5), 0.5% Annual Exceedance Probability (AEP)

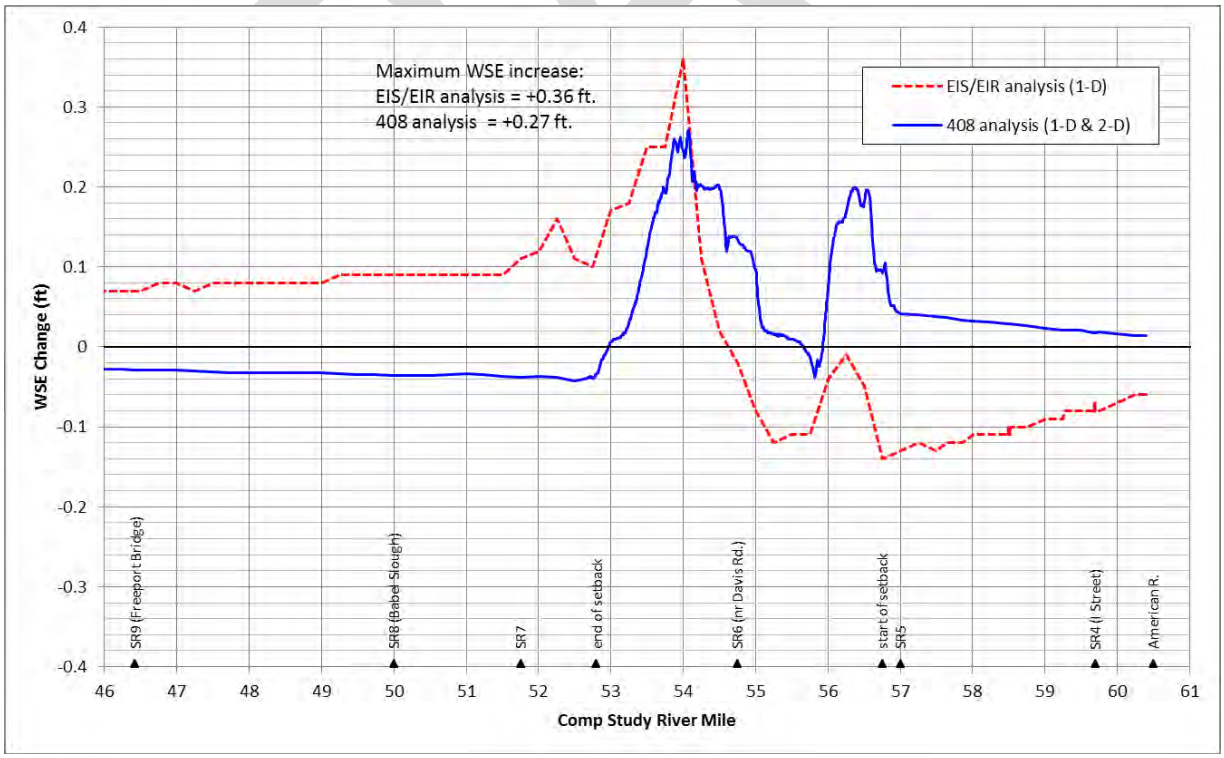

Figure 12. Computed Water Surface Elevation (WSE) change, 408 Analysis and EIS/EIR Analysis; Preferred Alternative (Alternative 5), 0.2% Annual Exceedance Probability (AEP)

Appendix C.2

Supplemental Memo: Refined Hydraulic Impact Analysis for the Southport Sacramento River Early Implementation Project Environmental Impact Statement/ Environmental Impact Report— MBK Engineers, September 9, 2013

HYDRAULIC IMPACT ANALYSIS FOR THE SOUTHPORT SACRAMENTO RIVER EARLY IMPLEMENTATION PROJECT ENVIRONMENTAL IMPACT STATEMENT/ ENVIRONMENTAL IMPACT REPORT

July 26, 2013

Prepared by: Mike Archer, P.E.

Reviewed by: Don Trieu, P.E.

1.0 Background

As part of the Southport Sacramento River Early Implementation Project (Project), the West Sacramento Area Flood Control Agency (WSAFCA) is studying five alternative projects with the purpose of achieving 0.5% (1 in 200) Annual Exceedance Probability (AEP) flood protection for a 5.6 mile reach of Sacramento River levee in the Southport project area. The Project area extends from about 0.4 miles downstream of the W.G. Stone Lock to the South Cross Levee (see Figures 1 and 2). The alternatives are described in detail in Section 6 of this Technical Memorandum. MBK Engineers (MBK) has performed a hydraulic impact analysis of the proposed alternatives, which is presented herein.

2.0 Purpose

The purpose of the hydraulic impact analysis is to determine impacts to water surface elevations and flows as a result of the proposed Project. The analysis is needed to satisfy the

requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) for disclosing environmental effects and recommended mitigation measures related to a proposed action.

The hydraulic impacts of the levee alterations proposed as part of the Project were evaluated for the following flood events:

- **1% (1 in 100) AEP**: approximating the conditions associated with the Sacramento River Flood Control Project's (SRFCP) 1957 water surface profiles that serve as the minimum design standard for the SRFCP and the base flood elevations that govern management of SRFCP protected floodplains under the National Flood Insurance Program,

- **0.5% (1 in 200) AEP**: approximating the conditions associated with the recently adopted State of California Urban Levee Design Criteria (ULDC),

- **0.2% (1 in 500) AEP**: representing an extreme flood event; the largest flood event for which hydrologic input data has been developed for the hydraulic simulation model.

Each of the above flood events was evaluated for the following conditions:

- **Existing**: The levee system and reservoir operation criteria as existed in January 2013.

- **Current With Project**: Existing condition with each of the proposed Project alternatives. Each Project alternative is evaluated separately.

- **No Action (Future Without Project)**: Likely future conditions without Project. Assumes implementation of the Federally authorized improvements to Folsom Dam (also known as the Folsom Joint Federal Project [JFP], or Folsom JFP), and anticipated improvements to levees protecting existing urban areas so as to provide those areas with 0.5% AEP flood protection.

- **Future With Project**: No Action condition with the addition of each of the proposed Project alternatives. Each Project alternative is evaluated separately.

3.0 Hydraulic Model

Release 4 of the U.S. Army Corps of Engineers (USACE) Sacramento River Basin HEC-RAS hydraulic simulation model (Model) was used for this analysis. The USACE release memo for the Model is provided in Appendix A. HEC-RAS is software designed to perform one-dimensional hydraulic calculations for a full network of natural and constructed channels. It was developed by the USACE Hydrologic Engineering Center. Version 4.1 of HEC-RAS has been utilized for the analysis documented herein.

The extents of the Model are shown in Figure 3. It includes the Sacramento River from Colusa to Collinsville in the Sacramento-San Joaquin Delta, the Sutter and Yolo Bypasses, the Feather River below Oroville Dam, the American River below Folsom Dam, and other major tributaries and distributaries.

For this analysis, the Model was modified to include the recently constructed USACE Sacramento River Bank Protection Project Erosion Repair Site River Mile (RM) 57.2R (see Figure 4).

4.0 Hydrology

As part of the Sacramento and San Joaquin River Basins Comprehensive Study, USACE developed hydrologic input data for the Model for numerous storm "centerings." The centerings relied on historical storm patterns in the upstream basin to define the shape and magnitude of the flow contributions from each of the basins, and were designed to stress specific locations within the system. The hydrologic data sets associated with the storm centerings designed to stress the SRFCP at the latitude of Sacramento (Sacramento Centering) and at Folsom Dam (American River Centering) were used for this analysis.

The USACE hydrologic input data included seven flood events: 50% AEP, 10% AEP, 4% AEP, 2% AEP, 1% AEP, 0.5% AEP, and 0.2% AEP. As noted previously in Section 2, the analysis presented herein used the 1% AEP, 0.5% AEP, and 0.2% AEP flood events.

The hydrology of the American River in the Model, representing Folsom Dam releases, differs between the Existing Condition and Without/With Project Condition due to the Folsom JFP. The effect of the Folsom JFP on the peak American River flow in the analyzed flood events is summarized in Table 1.

Table 1. Peak Folsom Dam Release to American River in Analyzed Flood Events

Flood Event	Peak Flow (cfs)	
	Without JFP	**With JFP**
1% AEP	145,000	115,000
0.5% AEP	321,000	160,000
0.2% AEP	513,200	405,500

cfs – cubic feet per second

5.0 Levee Performance Assumptions

An important assumption in performing hydraulic simulations of leveed systems on a regional basis is defining if, when, and how levee failures will occur. The analysis presented herein assumed levees would act as weirs when overtopped and not degrade or fail.

6.0 Project Alternatives

6.1 Alternative 1 - Adjacent Levee

Alternative 1 involves the construction of an adjacent levee landward of the Sacramento River levee (see Figure 5). At Bees Lakes, the new levee will not be adjacent to the existing levee, but rather will be setback to the west side of Bees Lakes. This alternative makes no alterations on the river side of the existing levee, therefore, no modification of hydraulic model cross-sections was required. The alternative includes vegetation removal, the extent and degree of which is not known with any detail at this time. For the purpose of this analysis, vegetation removal was conservatively represented in the hydraulic model by reducing the Manning's n-value roughness coefficient by almost 25%, from 0.033 to 0.025, on the right bank of the Sacramento River for the entire length of the Project reach.

6.2 Alternative 2 – Setback Levee with Bees Lakes Flow-through

Alternative 2 involves the construction of a setback levee just over four miles long with a typical offset distance of approximately 400 feet (see Figure 6). The existing levee will be partially degraded for its entire length and breached at five locations to allow water to flow into and out of the offset area. The levee setback was incorporated into the Model by modifying the affected cross-sections. Plots of the affected cross-sections showing the modifications are provided in Appendix B. Manning's n-value roughness coefficients in the offset area were based on a proposed planting plan and corresponding mature condition Manning's n-values described in a memorandum prepared by cbec eco engineering (cbec) with subject "Southport EIP – Roughness Value Development for the Offset Area under Interim and Mature Vegetative Conditions (DRAFT)," dated 8/28/12. Where the cbec memo provides n-value ranges, the highest value in the range was used. The n-values used in the Model in the offset area ranged from 0.035 to 0.150, with a weighted mean of about 0.11. Road embankments at the same elevation as the setback levee will be constructed at the upstream and downstream ends of the Bees Lakes area to allow for access to marinas on the Sacramento River. Culverts will be installed in the embankments to allow for hydraulic connectivity between the Sacramento River and Bees Lakes. The number of culverts and culvert dimensions are not known at this time. For the analysis, ten 10 foot diameter culverts were assumed for each embankment.

6.3 Alternative 3 – Slope Flattening

Alternative 3 involves flattening the water side slope of the levee to a 3:1 slope throughout the Project reach (see Figure 7). The existing water side slope is approximately 2:1. The slope flattening was incorporated into the Model by modifying the affected cross-sections. Plots of the affected cross-sections showing the modifications are provided in Appendix C.
Alternative 3 also includes vegetation removal similar to Alternative 1, modeled as described in Section 6.1.

6.4 Alternative 4 – Blended Setback Levee

Alternative 4 involves the construction of a setback levee about two miles in length starting downstream of Bees Lakes (see Figure 8). The remainder of the Project reach will have adjacent levee similar to Alternative 1, along with the vegetation removal component as described in Alternative 1. Bees Lakes is not hydraulically connected to the Sacramento River. This alternative was incorporated into the model using the cross-sections for River Stations (RS) 53.50 through 55.00 from Alternative 2 (see Appendix B), along with the corresponding offset area n-values which range from 0.035 to 0.150.

6.5 Alternative 5 – Setback Levee with Isolated Bees Lake

Alternative 5 (see Figure 9) is identical to Alternative 2 except for the following:

- There are no culverts in the marina access road embankments upstream and downstream of the Bees Lakes area, removing hydraulic connectivity with the Sacramento River.
- Slope flattening, rather than adjacent levee, is used for about 0.8 miles at the downstream end of the Project reach.

7.0 Results

Impacts to the computed maximum water surface elevations and peak flows have been determined and are discussed below for the following condition changes:

1. Existing to Current With Project
2. Existing to No Action
3. Existing to Future With Project
4. No Action to Future With Project

The computed maximum water surface elevations for the 1% AEP, 0.5% AEP, and 0.2% AEP flood events are provided at several index points in Tables 2 through 4, respectively. The index point locations are shown in Figure 10. The impacts on the maximum water surface elevation of going from Existing to Current With Project, Existing to Future With Project, and No Action to Future With Project are summarized for each Project Alternative separately in Tables 5 through 9. The impact on the maximum water surface elevation of going from Existing to No Action is summarized in Table 10. Profile plots of the computed maximum water surface elevations, along with profile plots showing the impacts, for all affected reaches are provided in Figures 11 through 130. In a similar manner, the computed peak flows for the 1% AEP, 0.5% AEP, and 0.2% AEP flood events are provided at several key locations in Tables 11 through 13, respectively. The impacts on the peak flow of going from Existing to Current With Project, Existing to Future With Project, and No Action to Future With Project are summarized for each Project Alternative separately in Tables 14 through 18. The impact on the peak flow of going

from Existing to No Action is summarized in Table 19. The computed impacts are discussed in the following sections.

There are no noticeable effects on the flood duration and for all of the Project Alternatives and flood frequencies. There are also no significant effects on the computed mean velocities.

The project is located about 3.6 miles downstream of the American River. During the large flood events evaluated herein, the Sacramento Weir gates are open and flows from the American River are split with some heading upstream to the Sacramento Weir and the remainder heading downstream toward the Project site. If the Project results in a water surface elevation change in the Sacramento River, the American River flow split can be effected. If the water surface elevation is lower, the flow heading downstream would increase and the flow heading to the Sacramento Weir would decrease. Additionally, the Sacramento Weir gate operation is tied to the stage in the Sacramento River at I Street gage which is located about 0.7 miles downstream of the American River and 2.9 miles upstream of the Project. The hydraulic model accounts for the effects of the Project on the American River flow split and the Sacramento Weir operation. The effect of the Project Alternatives on the American River Flow split and the Sacramento Weir flow can be seen in peak flow impacts shown in Tables 11 through 19.

7.1 Existing to Current With Project

7.1.1 Existing to Current With Alternative 1

The only difference between Existing and Alternative 1 is vegetation removal on the right bank throughout the Project reach, which is represented in the analysis by a 25% reduction in the Manning's n-value roughness coefficient on the right bank. This alternative has no measurable impact to the peak stage or peak flow in any of the events analyzed (see columns [1], [4], and [7] in Tables 5 and 14).

7.1.2 Existing to Current With Alternative 2

Alternative 2 consists of a four mile long levee setback with adjacent levee and vegetation removal for the remainder of the Project reach. The Bees Lakes area is hydraulically connected to the Sacramento River with culverts. The computed impacts are summarized in Tables 6 and 15.

7.1.2.1 1% AEP (column [1] in Tables 6 and 15)

In the 1% AEP event, Alternative 2 results in a decrease of 0.07 feet in the peak stage at the upstream end of the Project reach (RM 57.00) and an increase of 0.14 feet at the downstream end of the Project reach (RM 51.75). The maximum computed increase in peak stage is 0.31 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.13 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.05 feet. The increase in stage downstream of the Project is the result of a 0.9% increase in the peak flow in the Sacramento River below the American River, from

126,000 cfs to 127,100 cfs. The increase in flow is due to the effect of the peak stage decrease upstream of the Project on the flow split at the confluence of the Sacramento and American Rivers. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel is negligible, ranging from -0.01 feet to -0.03 feet.

7.1.2.2 0.5% AEP (column [4] in Tables 6 and 15)

In the 0.5% AEP event, Alternative 2 results in a decrease of 0.11 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.11 feet at the downstream end of the Project reach (RM 51.75). The maximum computed increase in peak stage is 0.34 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.09 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.05 feet. The increase in stage downstream of the Project is the result of a 1.1% increase in the peak flow in the Sacramento River below the American River, from 149,200 cfs to 150,900 cfs. The increase in flow is due to the effect of the peak stage decrease upstream of the Project on the flow split at the confluence of the Sacramento and American Rivers. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel is negligible, ranging from zero to -0.04 feet.

7.1.2.3 0.2% AEP (column [7] in Tables 6 and 15)

In the 0.2% AEP event, Alternative 2 results in a decrease of 0.12 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.09 feet at the downstream end of the Project reach (RM 51.75). The maximum computed increase in peak stage is 0.36 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.07 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.02 feet. The increase in stage downstream of the Project is the result of a 1.2% increase in the peak flow in the Sacramento River below the American River, from 163,600 cfs to 165,500 cfs. The increase in flow is due to the effect of the peak stage decrease upstream of the Project on the flow split at the confluence of the Sacramento and American Rivers. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel is negligible, ranging from zero to -0.03 feet.

7.1.3 Existing to Current With Alternative 3

Alternative 3 involves slope flattening on the water side of the existing levee and vegetation removal. This alternative has no measurable impact to the peak stage or peak flow in any of the events analyzed (see columns [1], [4], and [7] in Tables 7 and 16).

7.1.4 Existing to Current With Alternative 4

Alternative 4 consists of a two mile long levee setback starting downstream of Bees Lakes with adjacent levee and vegetation removal for the remainder of the Project reach. The Bees Lakes area is not hydraulically connected to the Sacramento River. The computed impacts are summarized in Tables 8 and 17.

7.1.4.1 1% AEP (column [1] in Tables 8 and 17)

In the 1% AEP event, Alternative 4 results in a decrease of 0.06 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.11 feet at the downstream end of the Project reach (RM 51.75). The maximum computed increase in peak stage is 0.28 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.10 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.04 feet. The increase in stage downstream of the Project is the result of a 0.6% increase in the peak flow in the Sacramento River below the American River, from 126,000 cfs to 126,800 cfs. The increase in flow is due to the effect of the peak stage decrease upstream of the Project on the flow split at the confluence of the Sacramento and American Rivers. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel is negligible, ranging from zero to -0.02 feet.

7.1.4.2 0.5% AEP (column [4] in Tables 8 and 17)

In the 0.5% AEP event, Alternative 4 results in a decrease of 0.09 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.09 feet at the downstream end of the Project reach (RM 51.75). The maximum computed increase in peak stage is 0.32 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.07 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.04 feet. The increase in stage downstream of the Project is the result of a 0.9% increase in the peak flow in the Sacramento River below the American River, from 149,200 cfs to 150,500 cfs. The increase in flow is due to the effect of the peak stage decrease upstream of the Project on the flow split at the confluence of the Sacramento and American Rivers. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel is negligible, ranging from zero to -0.03 feet.

7.1.4.3 0.2% AEP (column [7] in Tables 8 and 17)

In the 0.2% AEP event, Alternative 4 results a decrease of 0.10 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.07 feet at the downstream end of the Project reach (RM 51.75). The maximum computed increase in peak stage is 0.34 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.05 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.02 feet. The increase in stage downstream of the Project is the result of a 0.9% increase in the peak flow in the Sacramento River below the American River, from 163,600 cfs to 165,000 cfs. The increase in flow is due to the effect of the peak stage decrease upstream of the Project on the flow split at the confluence of the Sacramento and American Rivers. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel is negligible, ranging from zero to -0.03 feet.

7.1.5 Existing to Current With Alternative 5

Alternative 5 is similar to Alternative 2 with a four mile long levee setback and adjacent levee with vegetation removal for the remainder of the Project reach. It differs from Alternative 2 in that the Bees Lakes area is not hydraulically connected to the Sacramento River, and the adjacent levee is replaced with slope flattening for about 0.8 miles at the downstream end of the Project reach. The computed impacts are summarized in Tables 9 and 18.

7.1.5.1 1% AEP (column [1] in Tables 9 and 18)

In the 1% AEP event, Alternative 5 results in a decrease of 0.07 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.14 feet at the downstream end of the Project reach (RM 51.75). The maximum computed increase in peak stage is 0.30 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.13 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.05feet. The increase in stage downstream of the Project is the result of a 0.9% increase in the peak flow in the Sacramento River below the American River, from 126,000 cfs to 127,100 cfs. The increase in flow is due to the effect of the peak stage decrease upstream of the Project on the flow split at the confluence of the Sacramento and American Rivers. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel is negligible, ranging from zero to -0.03 feet.

7.1.5.2 0.5% AEP (column [4] in Tables 9 and 18)

In the 0.5% AEP event, Alternative 5 results in a decrease of 0.11 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.12 feet at the downstream end of the Project reach (RM 51.75). The maximum computed increase in peak stage is 0.33 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.09 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.05 feet. The increase in stage downstream of the Project is the result of a 1.1% increase in the peak flow in the Sacramento River below the American River, from 149,200 cfs to 150,900 cfs. The increase in flow is due to the effect of the peak stage decrease upstream of the Project on the flow split at the confluence of the Sacramento and American Rivers. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel is negligible, ranging from zero to -0.04 feet.

7.1.5.3 0.2% AEP (column [7] in Tables 9 and 18)

In the 0.2% AEP event, Alternative 5 results in a decrease of 0.13 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.10 feet at the downstream end of the Project reach (RM 51.75). The maximum computed increase in peak stage is 0.35 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.07 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.02 feet. The increase in stage downstream of the Project is the result of a 1.2% increase in the peak flow in the Sacramento River below the American River, from

163,600 cfs to 165,500 cfs. The increase in flow is due to the effect of the peak stage decrease upstream of the Project on the flow split at the confluence of the Sacramento and American Rivers. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel is negligible, ranging from zero to -0.03 feet.

7.2 Existing to No Action

This comparison shows the effects of the Folsom JFP and of bringing all urban levees up to a 0.5% AEP level of protection. As noted in Section 4, the Folsom JFP results in significant reductions in peak American River flows for the flood events analyzed. The computed impacts are summarized in Tables 10 and 19.

7.2.1 1% AEP (column [1] in Tables 10 and 19)

In the 1% AEP event, No Action results in a decrease in the computed peak stage at all index points, with a maximum decrease of 0.60 feet at Index Point SR2 (Sacramento River at Sacramento Weir). The peak stage decrease at the Project site ranges from 0.52 feet to 0.55 feet. Peak flow at the Project site decreases 3.0%, from 126,000 cfs to 122,200 cfs.

7.2.2 0.5% AEP (column [2] in Tables 10 and 19)

In the 0.5% AEP event, No Action results in a decrease in the computed peak stage at all index points, with a maximum decrease of 1.56 feet at Index Point SR4 (Sacramento River at I Street bridge). The peak stage decrease at the Project site ranges from 1.25 feet to 1.47 feet. Peak flow at the Project site decreases 10.2%, from 149,200 cfs to 134,000 cfs.

7.2.3 0.2% AEP (column [4] in Tables 10 and 19)

In the 0.2% AEP event, No Action results in very little change in the computed peak stage at all index points, likely due to extensive levee overtopping, both with and without the Folsom JFP and urban levee raises. The impact ranges from an increase of 0.06 feet to a decrease of 0.06 feet.

7.3 Existing to Future With Project

7.3.1 Existing to Future With Alternative 1

As noted in Section 7.1.1, Alternative 1 by itself has no measurable impact to the peak stage or peak flow in any of the events analyzed. Therefore, the impacts for this scenario, which are shown in columns [2], [5], and [8] in Tables 5 and 14, are due almost entirely to the Folsom JFP and 0.5% AEP urban levees and are essentially the same as those for the Existing to No Action scenario discussed in Section 7.2.

7.3.2 Existing to Future With Alternative 2

Alternative 2 consists of a four mile long levee setback with adjacent levee and vegetation removal for the remainder of the Project reach. The Bees Lakes area is hydraulically connected

to the Sacramento River with culverts. The future component for this scenario is the addition of the Folsom JFP and urban levees raised to provide 0.5% AEP level of protection where necessary. The computed impacts are summarized in Tables 6 and 15.

7.3.2.1 1% AEP (column [2] in Tables 6 and 15)

In the 1% AEP event, this scenario results in a decrease of 0.62 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and a decrease of 0.38 feet at the downstream end of the Project reach (RM 51.75). There is no measurable increase in peak stage anywhere in the system. Five miles downstream of the Project, at the Freeport bridge, the peak stage decrease is 0.35 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage decrease is 0.05 feet. The decrease in stage downstream of the Project is the result of a 2.2% decrease in the peak flow in the Sacramento River below the American River, from 126,000 cfs to 123,200 cfs. The decrease in flow is primarily due to reduced flow in the American River as a result of the Folsom JFP. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel ranges from -0.11 feet to -0.48 feet.

7.3.2.2 0.5% AEP (column [5] in Tables 6 and 15)

In the 0.5% AEP event, this scenario results in a decrease of 1.55 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and a decrease of 1.10 feet at the downstream end of the Project reach (RM 51.75). There is no measurable increase in peak stage anywhere in the system. Five miles downstream of the Project, at the Freeport bridge, the peak stage decrease is 0.93 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage decrease is 0.27 feet. The decrease in stage downstream of the Project is the result of a 9.4% decrease in the peak flow in the Sacramento River below the American River, from 149,200 cfs to 135,200 cfs. The decrease in flow is primarily due to reduced flow in the American River as a result of the Folsom JFP. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel ranges from -0.13 feet to -0.90 feet.

7.3.2.3 0.2% AEP (column [8] in Tables 6 and 15)

In the 0.2% AEP event, this scenario results in a decrease of 0.09 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.14 feet at the downstream end of the Project reach (RM 51.75). The maximum computed change in peak stage is +0.41 feet at RM 54.00.. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.11 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.02 feet. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel ranges from -0.07 feet to +0.01 feet.

7.3.3 Existing to Future With Alternative 3

As noted in Section 7.1.3, Alternative 3 by itself has no measurable impact to the peak stage or peak flow in any of the events analyzed. Therefore, the impacts for this scenario, which are shown in columns [2], [5], and [8] in Tables 7 and 16, are due almost entirely to the Folsom JFP and 0.5% AEP urban levees and are essentially the same as those for the Existing to No Action scenario discussed in Section 7.2.

7.3.4 Existing to Future With Alternative 4

Alternative 4 consists of a two mile long levee setback starting downstream of Bees Lakes with adjacent levee and vegetation removal for the remainder of the Project reach. The Bees Lakes area is not hydraulically connected to the Sacramento River. The future component for this scenario is the addition of the Folsom JFP and urban levees raised to provide 0.5% AEP level of protection where necessary. The computed impacts are summarized in Tables 8 and 17.

7.3.4.1 1% AEP (column [2] in Tables 8 and 17)

In the 1% AEP event, this scenario results in a decrease of 0.61 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and a decrease of 0.41 feet at the downstream end of the Project reach (RM 51.75). There is no measurable increase in peak stage anywhere in the system. Five miles downstream of the Project, at the Freeport bridge, the peak stage decrease is 0.38 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage decrease is 0.06 feet. The decrease in stage downstream of the Project is the result of a 2.4% decrease in the peak flow in the Sacramento River below the American River, from 126,000 cfs to 123,000 cfs. The decrease in flow is primarily due to reduced flow in the American River as a result of the Folsom JFP. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel ranges from -0.10 feet to -0.47 feet.

7.3.4.2 0.5% AEP (column [5] in Tables 8 and 17)

In the 0.5% AEP event, this scenario results in a decrease of 1.53 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and a decrease of 1.14 feet at the downstream end of the Project reach (RM 51.75). There is no measurable increase in peak stage anywhere in the system. Five miles downstream of the Project, at the Freeport bridge, the peak stage decrease is 0.96 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage decrease is 0.28 feet. The decrease in stage downstream of the Project is the result of a 9.6% decrease in the peak flow in the Sacramento River below the American River, from 149,200 cfs to 134,900 cfs. The decrease in flow is primarily due to reduced flow in the American River as a result of the Folsom JFP. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel ranges from -0.13 feet to -0.89 feet.

7.3.4.3 0.2% AEP (column [8] in Tables 8 and 17)

In the 0.2% AEP event, this scenario results in a decrease of 0.06 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.12 feet at the downstream end of the Project reach (RM 51.75). The maximum computed change in peak stage is +0.39 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.10 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.01 feet. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel ranges from -0.07 feet to +0.01 feet.

7.3.5 Existing to Future With Alternative 5

Alternative 5 is similar to Alternative 2 with a four mile long levee setback and adjacent levee with vegetation removal for the remainder of the Project reach. It differs from Alternative 2 in that the Bees Lakes area is not hydraulically connected to the Sacramento River and the adjacent levee is replaced with slope flattening for about 0.8 miles at the downstream end of the Project reach. The future component for this scenario is the addition of the Folsom JFP and urban levees raised to provide 0.5% AEP level of protection where necessary. The computed impacts are summarized in Tables 9 and 18.

7.3.5.1 1% AEP (column [2] in Tables 9 and 18)

In the 1% AEP event, this scenario results in a decrease of 0.62 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and a decrease of 0.38 feet at the downstream end of the Project reach (RM 51.75). There is no measurable increase in peak stage anywhere in the system. Five miles downstream of the Project, at the Freeport bridge, the peak stage decrease is 0.35 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage decrease is 0.05 feet. The decrease in stage downstream of the Project is the result of a 2.2% decrease in the peak flow in the Sacramento River below the American River, from 126,000 cfs to 123,200 cfs. The decrease in flow is primarily due to reduced flow in the American River as a result of the Folsom JFP. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel ranges from -0.11 feet to -0.48 feet.

7.3.5.2 0.5% AEP (column [5] in Tables 9 and 18)

In the 0.5% AEP event, this scenario results in a decrease of 1.55 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and a decrease of 1.10 feet at the downstream end of the Project reach (RM 51.75). There is no measurable increase in peak stage anywhere in the system. Five miles downstream of the Project, at the Freeport bridge, the peak stage decrease is 0.93 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage decrease is 0.27 feet. The decrease in stage downstream of the Project is the result of a 9.4% decrease in the peak flow in the Sacramento River below the American River, from 149,200 cfs to 135,200 cfs. The decrease in flow is primarily due to reduced flow in the

American River as a result of the Folsom JFP. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel ranges from -0.13 feet to -0.90 feet.

7.3.5.3 0.2% AEP (column [8] in Tables 9 and 18)

In the 0.2% AEP event, this scenario results in a decrease of 0.09 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.15 feet at the downstream end of the Project reach (RM 51.75). The maximum computed change in peak stage is +0.40 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.11 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.02 feet. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel ranges from -0.07 feet to +0.01 feet.

7.4 No Action to Future With Project

7.4.1 No Action to Future With Alternative 1

The only difference between No Action and Future With Alternative 1 is vegetation removal on the right bank throughout the Project reach, which is represented in the analysis by a 25% reduction in the Manning's n-value roughness coefficient on the right bank. This alternative has no measurable impact to the peak stage or peak flow in any of the events analyzed (see columns [3], [6], and [9] in Tables 5 and 14).

7.4.2 No Action to Future With Alternative 2

Alternative 2 consists of a four mile long levee setback with adjacent levee and vegetation removal for the remainder of the Project reach. The Bees Lakes area is hydraulically connected to the Sacramento River with culverts. The computed impacts are summarized in Tables 6 and 15.

7.4.2.1 1% AEP (column [3] in Tables 6 and 15)

In the 1% AEP event, Alternative 2 results in a decrease of 0.07 feet in the peak stage at the upstream end of the Project reach (RM 57.00) and an increase of 0.14 feet at the downstream end of the Project reach (RM 51.75). The maximum computed change in peak stage is +0.30 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.13 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.05 feet. The increase in stage downstream of the Project is the result of a 0.8% increase in the peak flow in the Sacramento River below the American River, from 122,200 cfs to 123,200 cfs. The increase in flow is due to the effect of the peak stage decrease upstream of the Project on the flow split at the confluence of the Sacramento and American Rivers. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel is negligible, ranging from zero to -0.03 feet.

7.4.2.2 0.5% AEP (column [6] in Tables 6 and 15)

In the 0.5% AEP event, Alternative 2 results in a decrease of 0.08 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.15 feet at the downstream end of the Project reach (RM 51.75). The maximum computed change in peak stage is +0.33 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.13 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.05 feet. The increase in stage downstream of the Project is the result of a 0.9% increase in the peak flow in the Sacramento River below the American River, from 134,000 cfs to 135,200 cfs. The increase in flow is due to the effect of the peak stage decrease upstream of the Project on the flow split at the confluence of the Sacramento and American Rivers. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel is negligible, ranging from zero to -0.03 feet.

7.4.2.3 0.2% AEP (column [9] in Tables 6 and 15)

In the 0.2% AEP event, Alternative 2 results in a decrease of 0.13 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.10 feet at the downstream end of the Project reach (RM 51.75). The maximum computed change in peak stage is +0.37 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.07 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.03 feet. The increase in stage downstream of the Project is the result of a 1.7% increase in the peak flow in the Sacramento River below the American River, from 155,500 cfs to 158,100 cfs. The increase in flow is due to the effect of the peak stage decrease upstream of the Project on the flow split at the confluence of the Sacramento and American Rivers. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel is negligible, ranging from zero to -0.04 feet.

7.4.3 No Action to Future With Alternative 3

Alternative 3 involves slope flattening on the water side of the existing levee and vegetation removal. This alternative has no measurable impact to the peak stage or peak flow in any of the events analyzed (see columns [3], [6], and [9] in Tables 7 and 16).

7.4.4 No Action to Future With Alternative 4

Alternative 4 consists of a two mile long levee setback starting downstream of Bees Lakes with adjacent levee and vegetation removal for the remainder of the Project reach. The Bees Lakes area is not hydraulically connected to the Sacramento River. The computed impacts are summarized in Tables 8 and 17.

7.4.4.1 1% AEP (column [3] in Tables 8 and 17)

In the 1% AEP event, Alternative 4 results in a decrease of 0.06 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.11 feet at the downstream end of the Project reach (RM 51.75). The maximum computed change in peak stage is +0.27

feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.10 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.04 feet. The increase in stage downstream of the Project is the result of a 0.7% increase in the peak flow in the Sacramento River below the American River, from 122,200 cfs to 123,000 cfs. The increase in flow is due to the effect of the peak stage decrease upstream of the Project on the flow split at the confluence of the Sacramento and American Rivers. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel is negligible, ranging from zero to -0.02 feet.

7.4.4.2 0.5% AEP (column [6] in Tables 8 and 17)

In the 0.5% AEP event, Alternative 4 results in a decrease of 0.06 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.11 feet at the downstream end of the Project reach (RM 51.75). The maximum computed change in peak stage is +0.31 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.10 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.04 feet. The increase in stage downstream of the Project is the result of a 0.7% increase in the peak flow in the Sacramento River below the American River, from 134,000 cfs to 134,900 cfs. The increase in flow is due to the effect of the peak stage decrease upstream of the Project on the flow split at the confluence of the Sacramento and American Rivers. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel is negligible, ranging from zero to -0.02 feet.

7.4.4.3 0.2% AEP (column [9] in Tables 8 and 17)

In the 0.2% AEP event, Alternative 4 results a decrease of 0.10 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.08 feet at the downstream end of the Project reach (RM 51.75). The maximum computed change in peak stage is +0.35 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.06 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.02 feet. The increase in stage downstream of the Project is the result of a 1.3% increase in the peak flow in the Sacramento River below the American River, from 155,500 cfs to 157,500 cfs. The increase in flow is due to the effect of the peak stage decrease upstream of the Project on the flow split at the confluence of the Sacramento and American Rivers. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel is negligible, ranging from zero to -0.03 feet.

7.4.5 No Action to Future With Alternative 5

Alternative 5 is similar to Alternative 2 with a four mile long levee setback and adjacent levee with vegetation removal for the remainder of the Project reach. It differs from Alternative 2 in that the Bees Lakes area is not hydraulically connected to the Sacramento River, and the adjacent levee is replaced with slope flattening for about 0.8 miles at the downstream end of the Project reach. The computed impacts are summarized in Tables 9 and 18.

7.4.5.1 1% AEP (column [3] in Tables 9 and 18)

In the 1% AEP event, Alternative 5 results in a decrease of 0.07 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.14 feet at the downstream end of the Project reach (RM 51.75). The maximum computed change in peak stage is +0.29 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.13 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.05feet. The increase in stage downstream of the Project is the result of a 0.8% increase in the peak flow in the Sacramento River below the American River, from 122,200 cfs to 123,200 cfs. The increase in flow is due to the effect of the peak stage decrease upstream of the Project on the flow split at the confluence of the Sacramento and American Rivers. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel is negligible, ranging from zero to -0.03 feet.

7.4.5.2 0.5% AEP (column [6] in Tables 9 and 18)

In the 0.5% AEP event, Alternative 5 results in a decrease of 0.08 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.15 feet at the downstream end of the Project reach (RM 51.75). The maximum computed change in peak stage is +0.32 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.13 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.05 feet. The increase in stage downstream of the Project is the result of a 0.9% increase in the peak flow in the Sacramento River below the American River, from 134,000 cfs to 135,200 cfs. The increase in flow is due to the effect of the peak stage decrease upstream of the Project on the flow split at the confluence of the Sacramento and American Rivers. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel is negligible, ranging from zero to -0.03 feet.

7.4.5.3 0.2% AEP (column [9] in Tables 9 and 18)

In the 0.2% AEP event, Alternative 5 results in a decrease of 0.13 feet in the peak stage at the upstream end of the Project reach (RM 57.00), and an increase of 0.11 feet at the downstream end of the Project reach (RM 51.75). The maximum computed change in peak stage is +0.36 feet at RM 54.00. Five miles downstream of the Project, at the Freeport bridge, the peak stage increase is 0.07 feet. Twenty-five miles downstream of the Project, at Walnut Grove, the peak stage increase is 0.03 feet. The increase in stage downstream of the Project is the result of a 1.7% increase in the peak flow in the Sacramento River below the American River, from 155,500 cfs to 158,100 cfs. The increase in flow is due to the effect of the peak stage decrease upstream of the Project on the flow split at the confluence of the Sacramento and American Rivers. The impact to peak stages at index points on the Yolo Bypass, Sacramento Bypass, and Sacramento River Deep Water Ship Channel is negligible, ranging from zero to -0.04 feet.

Table 2. 1% AEP Computed Maximum Water Surface Elevations

ID	Location	River Mile	1% AEP Computed Maximum Water Surface Elevation (ft. NAVD88)											
			Existing	Current with Alt. 1	Current with Alt. 2	Current with Alt. 3	Current with Alt. 4	Current with Alt. 5	No Action (Future without Project)	Future with Alt. 1	Future with Alt. 2	Future with Alt. 3	Future with Alt. 4	Future with Alt. 5
SR1	Sacramento R at Natomas Cross Canal	79.205	43.55	43.55	43.55	43.55	43.55	43.55	43.50	43.50	43.49	43.50	43.50	43.49
SR2	Sacramento R at Sacramento Weir	63.81	34.72	34.72	34.68	34.72	34.69	34.68	34.12	34.12	34.08	34.11	34.09	34.08
SR3	Sacramento R at I-80	62.971	35.27	35.27	35.23	35.26	35.24	35.23	34.71	34.71	34.68	34.71	34.68	34.68
SR4	Sacramento R at I Street bridge	59.692	34.96	34.96	34.92	34.96	34.93	34.92	34.39	34.39	34.35	34.39	34.36	34.35
SR5	Sacramento R at upstream end of Project reach	57.003	33.75	33.75	33.68	33.74	33.69	33.68	33.20	33.20	33.13	33.19	33.14	33.13
SR6	Sacramento R near Davis Road	54.746	32.86	32.86	32.89	32.85	32.86	32.88	32.32	32.32	32.35	32.32	32.32	32.34
SR7	Sacramento R at downstream end of Project reach	51.754	31.41	31.41	31.55	31.43	31.52	31.55	30.89	30.90	31.03	30.91	31.00	31.03
SR8	Sacramento R at Babel Slough	50	30.74	30.74	30.87	30.75	30.84	30.88	30.23	30.23	30.36	30.25	30.33	30.36
SR9	Sacramento R at Freeport bridge	46.427	29.04	29.04	29.17	29.05	29.14	29.17	28.56	28.57	28.69	28.58	28.66	28.69
SR10	Sacramento R at Walnut Grove	26.75	17.27	17.27	17.32	17.27	17.31	17.32	17.17	17.17	17.22	17.18	17.21	17.22
SB1	Sacramento Bypass below Sacramento Weir	1.49	33.73	33.73	33.70	33.73	33.71	33.70	33.28	33.28	33.25	33.28	33.26	33.25
YB1	Yolo Bypass at I-5	50.496	34.78	34.77	34.77	34.77	34.77	34.77	34.65	34.65	34.64	34.65	34.64	34.64
YB2	Yolo Bypass at Sacramento Bypass	44.13	31.95	31.95	31.94	31.95	31.94	31.94	31.76	31.76	31.75	31.76	31.75	31.75
YB3	Yolo Bypass at Lisbon Gage	35.672	28.72	28.72	28.70	28.71	28.71	28.70	28.58	28.58	28.56	28.58	28.57	28.56
SC1	Ship Channel at Turning Basin	42.954	19.88	19.88	19.88	19.88	19.88	19.88	19.78	19.78	19.77	19.78	19.78	19.77
SC2	Ship Channel at Cache Slough	19.536	19.89	19.89	19.88	19.89	19.89	19.88	19.78	19.78	19.77	19.78	19.77	19.77

Table 3. 0.5% AEP Computed Maximum Water Surface Elevations

ID	Location	River Mile	0.5% AEP Computed Maximum Water Surface Elevation (ft. NAVD88)											
			Existing	Current with Alt. 1	Current with Alt. 2	Current with Alt. 3	Current with Alt. 4	Current with Alt. 5	No Action (Future without Project)	Future with Alt. 1	Future with Alt. 2	Future with Alt. 3	Future with Alt. 4	Future with Alt. 5
SR1	Sacramento R at Natomas Cross Canal	79.205	44.61	44.61	44.61	44.61	44.61	44.61	44.57	44.57	44.57	44.57	44.57	44.57
SR2	Sacramento R at Sacramento Weir	63.81	37.55	37.55	37.50	37.55	37.52	37.50	36.01	36.01	35.96	36.00	35.97	35.96
SR3	Sacramento R at I-80	62.971	37.68	37.68	37.64	37.68	37.65	37.64	36.51	36.51	36.47	36.50	36.48	36.47
SR4	Sacramento R at I Street bridge	59.692	37.80	37.80	37.74	37.80	37.75	37.74	36.24	36.24	36.20	36.24	36.21	36.20
SR5	Sacramento R at upstream end of Project reach	57.003	36.49	36.49	36.38	36.48	36.40	36.38	35.02	35.02	34.94	35.01	34.96	34.94
SR6	Sacramento R near Davis Road	54.746	35.50	35.51	35.51	35.50	35.49	35.50	34.11	34.11	34.14	34.11	34.12	34.13
SR7	Sacramento R at downstream end of Project reach	51.754	33.88	33.88	33.99	33.90	33.97	34.00	32.63	32.63	32.78	32.65	32.74	32.78
SR8	Sacramento R at Babel Slough	50	33.16	33.17	33.27	33.18	33.25	33.28	31.96	31.96	32.10	31.97	32.07	32.10
SR9	Sacramento R at Freeport bridge	46.427	31.27	31.27	31.36	31.28	31.34	31.36	30.21	30.21	30.34	30.23	30.31	30.34
SR10	Sacramento R at Walnut Grove	26.75	18.37	18.37	18.42	18.38	18.41	18.42	18.05	18.05	18.10	18.05	18.09	18.10
SB1	Sacramento Bypass below Sacramento Weir	1.49	35.85	35.85	35.81	35.84	35.82	35.81	34.98	34.98	34.95	34.98	34.96	34.95
YB1	Yolo Bypass at I-5	50.496	36.09	36.09	36.09	36.09	36.09	36.09	35.94	35.94	35.93	35.93	35.93	35.93
YB2	Yolo Bypass at Sacramento Bypass	44.13	33.32	33.32	33.30	33.31	33.31	33.30	33.06	33.06	33.05	33.06	33.05	33.05
YB3	Yolo Bypass at Lisbon Gage	35.672	29.80	29.80	29.79	29.80	29.79	29.79	29.62	29.62	29.61	29.62	29.61	29.61
SC1	Ship Channel at Turning Basin	42.954	21.05	21.05	21.05	21.05	21.05	21.05	20.92	20.92	20.92	20.92	20.92	20.92
SC2	Ship Channel at Cache Slough	19.536	20.83	20.83	20.82	20.83	20.83	20.82	20.69	20.69	20.69	20.69	20.69	20.69

Table 4. 0.2% AEP Computed Maximum Water Surface Elevations

ID	Location	River Mile	0.2% AEP Computed Maximum Water Surface Elevation (ft. NAVD88)											
			Existing	Current with Alt. 1	Current with Alt. 2	Current with Alt. 3	Current with Alt. 4	Current with Alt. 5	No Action (Future without Project)	Future with Alt. 1	Future with Alt. 2	Future with Alt. 3	Future with Alt. 4	Future with Alt. 5
SR1	Sacramento R at Natomas Cross Canal	79.205	45.62	45.62	45.62	45.62	45.62	45.62	45.63	45.63	45.63	45.63	45.63	45.63
SR2	Sacramento R at Sacramento Weir	63.81	38.26	38.25	38.22	38.25	38.23	38.22	38.28	38.28	38.23	38.28	38.24	38.23
SR3	Sacramento R at I-80	62.971	38.43	38.42	38.39	38.42	38.40	38.39	38.46	38.46	38.42	38.46	38.43	38.42
SR4	Sacramento R at I Street bridge	59.692	38.45	38.45	38.39	38.44	38.41	38.39	38.51	38.51	38.43	38.50	38.45	38.43
SR5	Sacramento R at upstream end of Project reach	57.003	37.07	37.07	36.95	37.06	36.97	36.94	37.11	37.11	36.98	37.09	37.01	36.98
SR6	Sacramento R near Davis Road	54.746	36.02	36.02	36.01	36.01	35.99	36.00	36.06	36.06	36.05	36.05	36.03	36.04
SR7	Sacramento R at downstream end of Project reach	51.754	34.27	34.27	34.36	34.29	34.34	34.37	34.31	34.32	34.41	34.33	34.39	34.42
SR8	Sacramento R at Babel Slough	50	33.54	33.54	33.63	33.55	33.61	33.63	33.58	33.58	33.67	33.59	33.65	33.67
SR9	Sacramento R at Freeport bridge	46.427	31.59	31.59	31.66	31.60	31.64	31.66	31.63	31.63	31.70	31.64	31.69	31.70
SR10	Sacramento R at Walnut Grove	26.75	18.86	18.86	18.88	18.86	18.88	18.88	18.85	18.85	18.88	18.86	18.87	18.88
SB1	Sacramento Bypass below Sacramento Weir	1.49	36.73	36.73	36.70	36.72	36.71	36.70	36.77	36.77	36.73	36.76	36.74	36.73
YB1	Yolo Bypass at I-5	50.496	37.21	37.21	37.21	37.21	37.21	37.21	37.22	37.22	37.22	37.22	37.22	37.22
YB2	Yolo Bypass at Sacramento Bypass	44.13	34.26	34.26	34.23	34.25	34.23	34.23	34.21	34.21	34.20	34.21	34.21	34.20
YB3	Yolo Bypass at Lisbon Gage	35.672	30.62	30.62	30.60	30.62	30.60	30.60	30.57	30.57	30.56	30.57	30.56	30.56
SC1	Ship Channel at Turning Basin	42.954	22.43	22.43	22.42	22.43	22.42	22.42	22.38	22.38	22.36	22.38	22.37	22.36
SC2	Ship Channel at Cache Slough	19.536	22.31	22.31	22.29	22.31	22.30	22.29	22.25	22.25	22.24	22.25	22.24	22.24

Table 5. Impact on Maximum Water Surface Elevation – Project Alternative 1

ID	Location	River Mile	Impact on Maximum Water Surface Elevation (feet)								
			1% AEP			0.5% AEP			0.2% AEP		
			Existing to Current with Alt. 1	Existing to Future with Alt. 1	No Action to Future with Alt. 1	Existing to Current with Alt. 1	Existing to Future with Alt. 1	No Action to Future with Alt. 1	Existing to Current with Alt. 1	Existing to Future with Alt. 1	No Action to Future with Alt. 1
			[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
SR1	Sacramento R at Natomas Cross Canal	79.205	0	-0.05	0	0	-0.04	0	0	+0.01	0
SR2	Sacramento R at Sacramento Weir	63.81	0	-0.60	0	0	-1.54	0	-0.01	+0.02	0
SR3	Sacramento R at I-80	62.971	0	-0.56	0	0	-1.17	0	-0.01	+0.03	0
SR4	Sacramento R at I Street bridge	59.692	0	-0.57	0	0	-1.56	0	0	+0.06	0
SR5	Sacramento R at upstream end of Project reach	57.003	0	-0.55	0	0	-1.47	0	0	+0.04	0
SR6	Sacramento R near Davis Road	54.746	0	-0.54	0	+0.01	-1.39	0	0	+0.04	0
SR7	Sacramento R at downstream end of Project reach	51.754	0	-0.51	+0.01	0	-1.25	0	0	+0.05	+0.01
SR8	Sacramento R at Babel Slough	50	0	-0.51	0	+0.01	-1.20	0	0	+0.04	0
SR9	Sacramento R at Freeport bridge	46.427	0	-0.47	+0.01	0	-1.06	0	0	+0.04	0
SR10	Sacramento R at Walnut Grove	26.75	0	-0.10	0	0	-0.32	0	0	-0.01	0
SR max	Maximum impact on Sacramento R (RM)	[1]	+0.01	-0.01	+0.01	+0.01	-0.04	+0.01	+0.01	+0.08 (59.003)	+0.01
SB1	Sacramento Bypass below Sacramento Weir	1.49	0	-0.45	0	0	-0.87	0	0	+0.04	0
SB max	Maximum impact on Sacramento Bypass (RM)	[1]	0	-0.19	0	0	-0.26	0	0	+0.05	0
YB1	Yolo Bypass at I-5	50.496	-0.01	-0.13	0	0	-0.15	0	0	+0.01	0
YB2	Yolo Bypass at Sacramento Bypass	44.13	0	-0.19	0	0	-0.26	0	0	-0.05	0
YB3	Yolo Bypass at Lisbon Gage	35.672	0	-0.14	0	0	-0.18	0	0	-0.05	0
YB max	Maximum impact on Yolo Bypass (RM)	[1]	0	-0.09	0	0	-0.12	0	0	+0.01	0
SC1	Ship Channel at Turning Basin	42.954	0	-0.10	0	0	-0.13	0	0	-0.05	0
SC2	Ship Channel at Cache Slough	19.536	0	-0.11	0	0	-0.14	0	0	-0.06	0
SC max	Maximum impact on Ship Channel (RM)	[1]	0	-0.10	0	0	-0.12	+0.01	0	-0.05	0

[1] Location not shown if maximum water surface elevation impact is less than +0.05.

Table 6. Impact on Maximum Water Surface Elevation – Project Alternative 2

ID	Location	River Mile	Impact on Maximum Water Surface Elevation (feet)								
			1% AEP			0.5% AEP			0.2% AEP		
			Existing to Current with Alt. 2	Existing to Future with Alt. 2	No Action to Future with Alt. 2	Existing to Current with Alt. 2	Existing to Future with Alt. 2	No Action to Future with Alt. 2	Existing to Current with Alt. 2	Existing to Future with Alt. 2	No Action to Future with Alt. 2
			[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
SR1	Sacramento R at Natomas Cross Canal	79.205	0	-0.06	-0.01	0	-0.04	0	0	+0.01	0
SR2	Sacramento R at Sacramento Weir	63.81	-0.04	-0.64	-0.04	-0.05	-1.59	-0.05	-0.04	-0.03	-0.05
SR3	Sacramento R at I-80	62.971	-0.04	-0.59	-0.03	-0.04	-1.21	-0.04	-0.04	-0.01	-0.04
SR4	Sacramento R at I Street bridge	59.692	-0.04	-0.61	-0.04	-0.06	-1.60	-0.04	-0.06	-0.02	-0.08
SR5	Sacramento R at upstream end of Project reach	57.003	-0.07	-0.62	-0.07	-0.11	-1.55	-0.08	-0.12	-0.09	-0.13
SR6	Sacramento R near Davis Road	54.746	+0.03	-0.51	+0.03	+0.01	-1.36	+0.03	-0.01	+0.03	-0.01
SR7	Sacramento R at downstream end of Project reach	51.754	+0.14	-0.38	+0.14	+0.11	-1.10	+0.15	+0.09	+0.14	+0.10
SR8	Sacramento R at Babel Slough	50	+0.13	-0.38	+0.13	+0.11	-1.06	+0.14	+0.09	+0.13	+0.09
SR9	Sacramento R at Freeport bridge	46.427	+0.13	-0.35	+0.13	+0.09	-0.93	+0.13	+0.07	+0.11	+0.07
SR10	Sacramento R at Walnut Grove	26.75	+0.05	-0.05	+0.05	+0.05	-0.27	+0.05	+0.02	+0.02	+0.03
SR max	Maximum impact on Sacramento R (RM)	[1]	+0.31 (54.00)	+0.01	+0.30 (54.00)	+0.34 (54.00)	-0.04	+0.33 (54.00)	+0.36 (54.00)	+0.41 (54.00)	+0.37 (54.00)
SB1	Sacramento Bypass below Sacramento Weir	1.49	-0.03	-0.48	-0.03	-0.04	-0.90	-0.03	-0.03	0	-0.04
SB max	Maximum impact on Sacramento Bypass (RM)	[1]	-0.01	-0.20	-0.01	-0.01	-0.27	-0.01	-0.02	+0.01	-0.01
YB1	Yolo Bypass at I-5	50.496	-0.01	-0.14	-0.01	0	-0.16	-0.01	0	+0.01	-0.01
YB2	Yolo Bypass at Sacramento Bypass	44.13	-0.01	-0.20	-0.01	-0.02	-0.27	-0.01	-0.03	-0.06	0
YB3	Yolo Bypass at Lisbon Gage	35.672	-0.02	-0.16	-0.01	-0.01	-0.19	-0.01	-0.02	-0.06	-0.01
YB max	Maximum impact on Yolo Bypass (RM)	[1]	0	-0.09	-0.02	0	-0.11	-0.01	0	+0.01	-0.01
SC1	Ship Channel at Turning Basin	42.954	0	-0.11	0	0	-0.13	0	-0.01	-0.07	0
SC2	Ship Channel at Cache Slough	19.536	-0.01	-0.12	-0.01	-0.01	-0.14	0	-0.02	-0.07	-0.02
SC max	Maximum impact on Ship Channel (RM)	[1]	0	-0.10	-0.01	0	-0.12	0	-0.01	-0.06	-0.01

[1] Location not shown if maximum water surface elevation impact is less than +0.05.

Table 7. Impact on Maximum Water Surface Elevation – Project Alternative 3

ID	Location	River Mile	Impact on Maximum Water Surface Elevation (feet)								
			1% AEP			0.5% AEP			0.2% AEP		
			Existing to Current with Alt. 3	Existing to Future with Alt. 3	No Action to Future with Alt. 3	Existing to Current with Alt. 3	Existing to Future with Alt. 3	No Action to Future with Alt. 3	Existing to Current with Alt. 3	Existing to Future with Alt. 3	No Action to Future with Alt. 3
			[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
SR1	Sacramento R at Natomas Cross Canal	79.205	0	-0.05	0	0	-0.04	0	0	+0.01	0
SR2	Sacramento R at Sacramento Weir	63.81	0	-0.61	-0.01	0	-1.55	-0.01	-0.01	+0.02	0
SR3	Sacramento R at I-80	62.971	-0.01	-0.56	0	0	-1.18	-0.01	-0.01	+0.03	0
SR4	Sacramento R at I Street bridge	59.692	0	-0.57	0	0	-1.56	0	-0.01	+0.05	-0.01
SR5	Sacramento R at upstream end of Project reach	57.003	-0.01	-0.56	-0.01	-0.01	-1.48	-0.01	-0.01	+0.02	-0.02
SR6	Sacramento R near Davis Road	54.746	-0.01	-0.54	0	0	-1.39	0	-0.01	+0.03	-0.01
SR7	Sacramento R at downstream end of Project reach	51.754	+0.02	-0.50	+0.02	+0.02	-1.23	+0.02	+0.02	+0.06	+0.02
SR8	Sacramento R at Babel Slough	50	+0.01	-0.49	+0.02	+0.02	-1.19	+0.01	+0.01	+0.05	+0.01
SR9	Sacramento R at Freeport bridge	46.427	+0.01	-0.46	+0.02	+0.01	-1.04	+0.02	+0.01	+0.05	+0.01
SR10	Sacramento R at Walnut Grove	26.75	0	-0.09	+0.01	+0.01	-0.32	0	0	0	+0.01
SR max	Maximum impact on Sacramento R (RM)	[1]	+0.05 (52.255)	-0.01	+0.05 (52.255)	+0.06 (52.255)	-0.04	+0.06 (52.255)	+0.06 (52.255)	+0.11 (52.255)	+0.07 (52.255)
SB1	Sacramento Bypass below Sacramento Weir	1.49	0	-0.45	0	-0.01	-0.87	0	-0.01	+0.03	-0.01
SB max	Maximum impact on Sacramento Bypass (RM)	[1]	0	-0.19	0	0	-0.26	0	0	+0.04	0
YB1	Yolo Bypass at I-5	50.496	-0.01	-0.13	0	0	-0.16	0	0	+0.01	0
YB2	Yolo Bypass at Sacramento Bypass	44.13	0	-0.19	0	-0.01	-0.26	-0.01	-0.01	-0.05	0
YB3	Yolo Bypass at Lisbon Gage	35.672	-0.01	-0.14	0	0	-0.18	0	0	-0.05	0
YB max	Maximum impact on Yolo Bypass (RM)	[1]	0	-0.09	0	0	-0.10	0	0	+0.01	0
SC1	Ship Channel at Turning Basin	42.954	0	-0.10	0	0	-0.13	0	0	-0.05	0
SC2	Ship Channel at Cache Slough	19.536	0	-0.11	0	0	-0.14	0	0	-0.06	0
SC max	Maximum impact on Ship Channel (RM)	[1]	0	-0.10	0	0	-0.12	0	0	-0.05	0

[1] Location not shown if maximum water surface elevation impact is less than +0.05.

Table 8. Impact on Maximum Water Surface Elevation – Project Alternative 4

ID	Location	River Mile	Impact on Maximum Water Surface Elevation (feet)								
			1% AEP			0.5% AEP			0.2% AEP		
			Existing to Current with Alt. 4	Existing to Future with Alt. 4	No Action to Future with Alt. 4	Existing to Current with Alt. 4	Existing to Future with Alt. 4	No Action to Future with Alt. 4	Existing to Current with Alt. 4	Existing to Future with Alt. 4	No Action to Future with Alt. 4
			[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
SR1	Sacramento R at Natomas Cross Canal	79.205	0	-0.05	0	0	-0.04	0	0	+0.01	0
SR2	Sacramento R at Sacramento Weir	63.81	-0.03	-0.63	-0.03	-0.03	-1.58	-0.04	-0.03	-0.02	-0.04
SR3	Sacramento R at I-80	62.971	-0.03	-0.59	-0.03	-0.03	-1.20	-0.03	-0.03	0	-0.03
SR4	Sacramento R at I Street bridge	59.692	-0.03	-0.60	-0.03	-0.05	-1.59	-0.03	-0.04	0	-0.06
SR5	Sacramento R at upstream end of Project reach	57.003	-0.06	-0.61	-0.06	-0.09	-1.53	-0.06	-0.10	-0.06	-0.10
SR6	Sacramento R near Davis Road	54.746	0	-0.54	0	-0.01	-1.38	+0.01	-0.03	+0.01	-0.03
SR7	Sacramento R at downstream end of Project reach	51.754	+0.11	-0.41	+0.11	+0.09	-1.14	+0.11	+0.07	+0.12	+0.08
SR8	Sacramento R at Babel Slough	50	+0.10	-0.41	+0.10	+0.09	-1.09	+0.11	+0.07	+0.11	+0.07
SR9	Sacramento R at Freeport bridge	46.427	+0.10	-0.38	+0.10	+0.07	-0.96	+0.10	+0.05	+0.10	+0.06
SR10	Sacramento R at Walnut Grove	26.75	+0.04	-0.06	+0.04	+0.04	-0.28	+0.04	+0.02	+0.01	+0.02
SR max	Maximum impact on Sacramento R (RM)	[1]	+0.28 (54.00)	+0.01	+0.27 (54.00)	+0.32 (54.00)	-0.04	+0.31 (54.00)	+0.34 (54.00)	+0.39 (54.00)	+0.35 (54.00)
SB1	Sacramento Bypass below Sacramento Weir	1.49	-0.02	-0.47	-0.02	-0.03	-0.89	-0.02	-0.02	+0.01	-0.03
SB max	Maximum impact on Sacramento Bypass (RM)	[1]	-0.01	-0.20	-0.01	-0.01	-0.27	-0.01	-0.01	+0.02	0
YB1	Yolo Bypass at I-5	50.496	-0.01	-0.14	-0.01	0	-0.16	-0.01	0	+0.01	0
YB2	Yolo Bypass at Sacramento Bypass	44.13	-0.01	-0.20	-0.01	-0.01	-0.27	-0.01	-0.03	-0.05	0
YB3	Yolo Bypass at Lisbon Gage	35.672	-0.01	-0.15	-0.01	-0.01	-0.19	-0.01	-0.02	-0.06	0
YB max	Maximum impact on Yolo Bypass (RM)	[1]	0	-0.09	-0.01	0	-0.11	-0.01	0	+0.01	-0.01
SC1	Ship Channel at Turning Basin	42.954	0	-0.10	0	0	-0.13	0	-0.01	-0.06	0
SC2	Ship Channel at Cache Slough	19.536	0	-0.12	0	0	-0.14	0	-0.01	-0.07	-0.01
SC max	Maximum impact on Ship Channel (RM)	[1]	0	-0.10	-0.01	0	-0.12	0	-0.01	-0.06	-0.01

[1] Location not shown if maximum water surface elevation impact is less than +0.05.

Table 9. Impact on Maximum Water Surface Elevation – Project Alternative 5

ID	Location	River Mile	Impact on Maximum Water Surface Elevation (feet)								
			1% AEP			0.5% AEP			0.2% AEP		
			Existing to Current with Alt. 5	Existing to Future with Alt. 5	No Action to Future with Alt. 5	Existing to Current with Alt. 5	Existing to Future with Alt. 5	No Action to Future with Alt. 5	Existing to Current with Alt. 5	Existing to Future with Alt. 5	No Action to Future with Alt. 5
			[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
SR1	Sacramento R at Natomas Cross Canal	79.205	0	-0.06	-0.01	0	-0.04	0	0	+0.01	0
SR2	Sacramento R at Sacramento Weir	63.81	-0.04	-0.64	-0.04	-0.05	-1.59	-0.05	-0.04	-0.03	-0.05
SR3	Sacramento R at I-80	62.971	-0.04	-0.59	-0.03	-0.04	-1.21	-0.04	-0.04	-0.01	-0.04
SR4	Sacramento R at I Street bridge	59.692	-0.04	-0.61	-0.04	-0.06	-1.60	-0.04	-0.06	-0.02	-0.08
SR5	Sacramento R at upstream end of Project reach	57.003	-0.07	-0.62	-0.07	-0.11	-1.55	-0.08	-0.13	-0.09	-0.13
SR6	Sacramento R near Davis Road	54.746	+0.02	-0.52	+0.02	0	-1.37	+0.02	-0.02	+0.02	-0.02
SR7	Sacramento R at downstream end of Project reach	51.754	+0.14	-0.38	+0.14	+0.12	-1.10	+0.15	+0.10	+0.15	+0.11
SR8	Sacramento R at Babel Slough	50	+0.14	-0.38	+0.13	+0.12	-1.06	+0.14	+0.09	+0.13	+0.09
SR9	Sacramento R at Freeport bridge	46.427	+0.13	-0.35	+0.13	+0.09	-0.93	+0.13	+0.07	+0.11	+0.07
SR10	Sacramento R at Walnut Grove	26.75	+0.05	-0.05	+0.05	+0.05	-0.27	+0.05	+0.02	+0.02	+0.03
SR max	Maximum impact on Sacramento R (RM)	[1]	+0.30 (54.00)	+0.01	+0.29 (54.00)	+0.33 (54.00)	-0.04	+0.32 (54.00)	+0.35 (54.00)	+0.40 (54.00)	+0.36 (54.00)
SB1	Sacramento Bypass below Sacramento Weir	1.49	-0.03	-0.48	-0.03	-0.04	-0.90	-0.03	-0.03	0	-0.04
SB max	Maximum impact on Sacramento Bypass (RM)	[1]	-0.01	-0.14	-0.01	-0.01	-0.27	-0.01	-0.02	+0.01	-0.01
YB1	Yolo Bypass at I-5	50.496	-0.01	-0.20	-0.01	0	-0.16	-0.01	0	+0.01	-0.01
YB2	Yolo Bypass at Sacramento Bypass	44.13	-0.02	-0.16	-0.01	-0.02	-0.27	-0.01	-0.03	-0.06	0
YB3	Yolo Bypass at Lisbon Gage	35.672	0	-0.09	-0.01	-0.01	-0.19	-0.01	-0.02	-0.06	-0.01
YB max	Maximum impact on Yolo Bypass (RM)	[1]	0	-0.11	-0.02	0	-0.11	-0.01	0	+0.01	-0.01
SC1	Ship Channel at Turning Basin	42.954	-0.01	-0.12	0	0	-0.13	0	-0.01	-0.07	0
SC2	Ship Channel at Cache Slough	19.536	0	-0.10	-0.01	-0.01	-0.14	0	-0.02	-0.07	-0.02
SC max	Maximum impact on Ship Channel (RM)	[1]	-0.01	-0.14	-0.01	0	-0.12	0	-0.01	-0.06	-0.01

[1] Location not shown if maximum water surface elevation impact is less than +0.05.

Table 10. Impact on Maximum Water Surface Elevation – Existing to No Action

ID	Location	River Mile	Impact on Maximum Water Surface Elevation (feet)		
			1% AEP [1]	0.5% AEP [2]	0.2% AEP [3]
SR1	Sacramento R at Natomas Cross Canal	79.205	-0.05	-0.04	+0.01
SR2	Sacramento R at Sacramento Weir	63.81	-0.60	-1.54	+0.02
SR3	Sacramento R at I-80	62.971	-0.56	-1.17	+0.03
SR4	Sacramento R at I Street bridge	59.692	-0.57	-1.56	+0.06
SR5	Sacramento R at upstream end of Project reach	57.003	-0.55	-1.47	+0.04
SR6	Sacramento R near Davis Road	54.746	-0.54	-1.39	+0.04
SR7	Sacramento R at downstream end of Project reach	51.754	-0.52	-1.25	+0.04
SR8	Sacramento R at Babel Slough	50	-0.51	-1.20	+0.04
SR9	Sacramento R at Freeport bridge	46.427	-0.48	-1.06	+0.04
SR10	Sacramento R at Walnut Grove	26.75	-0.10	-0.32	-0.01
SR max	Maximum impact on Sacramento R (RM)	[1]	-0.01	-0.04	+0.08 (59.003)
SB1	Sacramento Bypass below Sacramento Weir	1.49	-0.45	-0.87	+0.04
SB max	Maximum impact on Sacramento Bypass (RM)	[1]	-0.19	-0.26	+0.05 (1.68)
YB1	Yolo Bypass at I-5	50.496	-0.13	-0.15	+0.01
YB2	Yolo Bypass at Sacramento Bypass	44.13	-0.19	-0.26	-0.05
YB3	Yolo Bypass at Lisbon Gage	35.672	-0.14	-0.18	-0.05
YB max	Maximum impact on Yolo Bypass (RM)	[1]	-0.09	-0.10	+0.01
SC1	Ship Channel at Turning Basin	42.954	-0.10	-0.13	-0.05
SC2	Ship Channel at Cache Slough	19.536	-0.11	-0.14	-0.06
SC max	Maximum impact on Ship Channel (RM)	[1]	-0.10	-0.12	-0.05

[1] Location not shown if maximum water surface elevation impact is less than +0.05.

Table 11. 1% AEP Computed Peak Flow

Location	1% AEP Computed Peak Flow (cfs)											
	Existing	**Current with Alt. 1**	**Current with Alt. 2**	**Current with Alt. 3**	**Current with Alt. 4**	**Current with Alt. 5**	**No Action** (Future without Project)	**Future with Alt. 1**	**Future with Alt. 2**	**Future with Alt. 3**	**Future with Alt. 4**	**Future with Alt. 5**
Sacramento R. abv Sacramento Weir	119,300	119,300	119,400	119,300	119,400	119,400	120,200	120,200	120,300	120,200	120,300	120,300
Sacramento R. blw Sacramento Weir [1]	75,300	75,300	75,400	75,300	75,400	75,400	75,300	75,300	75,400	75,300	75,400	75,400
	-34,400	-34,400	-33,300	-34,300	-33,600	-33,300	-14,100	-14,100	-13,100	-14,000	-13,300	-13,100
Sacramento R. blw American R.	126,000	126,000	127,100	126,100	126,800	127,100	122,200	122,200	123,200	122,300	123,000	123,200
Sacramento R. at Freeport	125,700	125,700	126,700	125,800	126,400	126,700	121,800	121,800	122,800	121,900	122,600	122,800
Sacramento Weir	133,300	133,300	132,400	133,200	132,600	132,400	116,500	116,500	115,600	116,400	115,800	115,600
Fremont Weir	401,900	401,900	401,800	401,900	401,800	401,800	400,700	400,700	400,700	400,700	400,700	400,700
Yolo Byp. blw Sacramento Byp.	551,600	551,600	550,600	551,500	550,900	550,600	537,100	537,100	536,200	537,000	536,400	536,200

[1] Due to Sacramento Weir operation, flow at this location is bi-directional. Positive value is peak flow in downstream direction; negative value is peak flow in upstream direction.

Table 12. 0.5% AEP Computed Peak Flow

Location	0.5% AEP Computed Peak Flow (cfs)											
	Existing	**Current with Alt. 1**	**Current with Alt. 2**	**Current with Alt. 3**	**Current with Alt. 4**	**Current with Alt. 5**	**No Action** (Future without Project)	**Future with Alt. 1**	**Future with Alt. 2**	**Future with Alt. 3**	**Future with Alt. 4**	**Future with Alt. 5**
Sacramento R. abv Sacramento Weir	123,800	123,800	123,900	123,800	123,900	123,900	124,000	124,000	124,100	124,000	124,100	124,200
Sacramento R. blw Sacramento Weir [1]	76,300	76,300	76,400	76,300	76,400	76,400	76,300	76,300	76,400	76,300	76,400	76,400
	-94,200	-94,200	-92,800	-94,000	-93,200	-92,800	-39,600	-39,600	-38,400	-39,500	-38,700	-38,400
Sacramento R. blw American R.	149,200	149,200	150,900	149,400	150,500	150,900	134,000	134,000	135,200	134,100	134,900	135,200
Sacramento R. at Freeport	145,200	145,200	146,400	145,300	146,100	146,400	133,700	133,700	134,900	133,900	134,600	134,900
Sacramento Weir	196,200	196,200	195,200	196,100	195,400	195,200	151,500	151,500	150,500	151,400	150,700	150,500
Fremont Weir	445,700	445,700	445,700	445,700	445,700	445,700	445,800	445,800	445,800	445,800	445,800	445,800
Yolo Byp. blw Sacramento Byp.	656,800	656,800	655,800	656,700	656,000	655,800	632,600	632,600	631,700	632,500	631,900	631,600

[1] Due to Sacramento Weir operation, flow at this location is bi-directional. Positive value is peak flow in downstream direction; negative value is peak flow in upstream direction.

Table 13. 0.2% AEP Computed Peak Flow

Location	0.2% AEP Computed Peak Flow (cfs)											
	Existing	**Current with Alt. 1**	**Current with Alt. 2**	**Current with Alt. 3**	**Current with Alt. 4**	**Current with Alt. 5**	**No Action** (Future without Project)	**Future with Alt. 1**	**Future with Alt. 2**	**Future with Alt. 3**	**Future with Alt. 4**	**Future with Alt. 5**
Sacramento R. abv Sacramento Weir	126,100	126,100	126,200	126,100	126,200	126,200	126,400	126,400	126,600	126,500	126,600	126,600
Sacramento R. blw Sacramento Weir [1]	77,600	77,600	77,700	77,600	77,700	77,700	77,600	77,600	77,700	77,600	77,700	77,700
	-99,900	-99,900	-98,600	-99,800	-98,900	-98,600	-88,500	-88,500	-86,700	-88,300	-87,200	-86,700
Sacramento R. blw American R.	163,600	163,600	165,500	163,800	165,000	165,500	155,500	155,500	158,100	155,800	157,500	158,100
Sacramento R. at Freeport	149,300	149,300	150,400	149,400	150,100	150,400	149,600	149,600	150,700	149,700	150,500	150,700
Sacramento Weir	204,200	204,200	203,300	204,100	203,500	203,300	199,800	199,800	198,500	199,700	198,800	198,500
Fremont Weir	498,000	498,000	498,000	498,000	498,000	498,000	498,300	498,300	498,300	498,300	498,300	498,300
Yolo Byp. blw Sacramento Byp.	726,500	726,600	723,600	726,200	724,200	723,500	724,500	724,500	723,700	724,400	723,900	723,700

[1] Due to Sacramento Weir operation, flow at this location is bi-directional. Positive value is peak flow in downstream direction; negative value is peak flow in upstream direction.

Table 14. Impact on Peak Flow – Project Alternative 1

Location	Impact on Peak Flow (%)								
	1% AEP			**0.5% AEP**			**0.2% AEP**		
	Existing to Current with Alt. 1	**Existing to Future with Alt. 1**	**No Action to Future with Alt. 1**	**Existing to Current with Alt. 1**	**Existing to Future with Alt. 1**	**No Action to Future with Alt. 1**	**Existing to Current with Alt. 1**	**Existing to Future with Alt. 1**	**No Action to Future with Alt. 1**
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Sacramento R. abv Sacramento Weir	0%	+0.8%	0%	0%	+0.2%	0%	0%	+0.2%	0%
Sacramento R. blw Sacramento Weir[1]									
peak flow in downstream direction	0%	0%	0%	0%	0%	0%	0%	0%	0%
peak flow in upstream direction	0%	-59.0%	0%	0%	-58.0%	0%	0%	-11.4%	0%
Sacramento R. blw American R.	0%	-3.0%	0%	0%	-10.2%	0%	0%	-5.0%	0%
Sacramento R. at Freeport	0%	-3.1%	0%	0%	-7.9%	0%	0%	+0.2%	0%
Sacramento Weir	0%	-12.6%	0%	0%	-22.8%	0%	0%	-2.2%	0%
Fremont Weir	0%	-0.3%	0%	0%	0%	0%	0%	+0.1%	0%
Yolo Byp. blw Sacramento Byp.	0%	-2.6%	0%	0%	-3.7%	0%	0%	-0.3%	0%

[1] Due to Sacramento Weir operation, flow at this location is bi-directional.

Table 15. Impact on Peak Flow – Project Alternative 2

Location	Impact on Peak Flow (%)								
	1% AEP			0.5% AEP			0.2% AEP		
	Existing to Current with Alt. 2	Existing to Future with Alt. 2	No Action to Future with Alt. 2	Existing to Current with Alt. 2	Existing to Future with Alt. 2	No Action to Future with Alt. 2	Existing to Current with Alt. 2	Existing to Future with Alt. 2	No Action to Future with Alt. 2
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Sacramento R. abv Sacramento Weir	+0.1%	+0.8%	+0.1%	+0.1%	+0.2%	+0.1%	+0.1%	+0.4%	+0.2%
Sacramento R. blw Sacramento Weir[1]									
peak flow in downstream direction	+0.1%	+0.1%	+0.1%	+0.1%	+0.1%	+0.1%	+0.1%	+0.1%	+0.1%
peak flow in upstream direction	-3.2%	-61.9%	-7.1%	-1.5%	-59.2%	-3.0%	-1.3%	-13.2%	-2.0%
Sacramento R. blw American R.	+0.9%	-2.2%	+0.8%	+1.1%	-9.4%	+0.9%	+1.2%	-3.4%	+1.7%
Sacramento R. at Freeport	+0.8%	-2.3%	+0.8%	+0.8%	-7.1%	+0.9%	+0.7%	+0.9%	+0.7%
Sacramento Weir	-0.7%	-13.3%	-0.8%	-0.5%	-23.3%	-0.7%	-0.4%	-2.8%	-0.7%
Fremont Weir	0%	-0.3%	0%	0%	0%	0%	0%	+0.1%	0%
Yolo Byp. blw Sacramento Byp.	-0.2%	-2.8%	-0.2%	-0.2%	-3.8%	-0.1%	-0.4%	-0.4%	-0.1%

[1] Due to Sacramento Weir operation, flow at this location is bi-directional.

Table 16. Impact on Peak Flow – Project Alternative 3

Location	Impact on Peak Flow (%)								
	1% AEP			0.5% AEP			0.2% AEP		
	Existing to Current with Alt. 3	Existing to Future with Alt. 3	No Action to Future with Alt. 3	Existing to Current with Alt. 3	Existing to Future with Alt. 3	No Action to Future with Alt. 3	Existing to Current with Alt. 3	Existing to Future with Alt. 3	No Action to Future with Alt. 3
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Sacramento R. abv Sacramento Weir	0%	+0.8%	0%	0%	+0.2%	0%	0%	+0.3%	+0.1%
Sacramento R. blw Sacramento Weir[1]									
peak flow in downstream direction	0%	0%	0%	0%	0%	0%	0%	0%	0%
peak flow in upstream direction	-0.3%	-59.3%	-0.7%	-0.2%	-58.1%	-0.3%	-0.1%	-11.6%	-0.2%
Sacramento R. blw American R.	+0.1%	-2.9%	+0.1%	+0.1%	-10.1%	+0.1%	+0.1%	-4.8%	+0.2%
Sacramento R. at Freeport	+0.1%	-3.0%	+0.1%	+0.1%	-7.8%	+0.1%	+0.1%	+0.3%	+0.1%
Sacramento Weir	-0.1%	-12.7%	-0.1%	-0.1%	-22.8%	-0.1%	0%	-2.2%	-0.1%
Fremont Weir	0%	-0.3%	0%	0%	0%	0%	0%	+0.1%	0%
Yolo Byp. blw Sacramento Byp.	0%	-2.6%	0%	0%	-3.7%	0%	0%	-0.3%	0%

[1] Due to Sacramento Weir operation, flow at this location is bi-directional.

Table 17. Impact on Peak Flow – Project Alternative 4

Location	Impact on Peak Flow (%)								
	1% AEP			0.5% AEP			0.2% AEP		
	Existing to Current with Alt. 4	Existing to Future with Alt. 4	No Action to Future with Alt. 4	Existing to Current with Alt. 4	Existing to Future with Alt. 4	No Action to Future with Alt. 4	Existing to Current with Alt. 4	Existing to Future with Alt. 4	No Action to Future with Alt. 4
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Sacramento R. abv Sacramento Weir	+0.1%	+0.8%	+0.1%	+0.1%	+0.2%	+0.1%	+0.1%	+0.4%	+0.2%
Sacramento R. blw Sacramento Weir[1]									
peak flow in downstream direction	+0.1%	+0.1%	+0.1%	+0.1%	+0.1%	+0.1%	+0.1%	+0.1%	+0.1%
peak flow in upstream direction	-2.3%	-61.3%	-5.7%	-1.1%	-58.9%	-2.3%	-1.0%	-12.7%	-1.5%
Sacramento R. blw American R.	+0.6%	-2.4%	+0.7%	+0.9%	-9.6%	+0.7%	+0.9%	-3.7%	+1.3%
Sacramento R. at Freeport	+0.6%	-2.5%	+0.7%	+0.6%	-7.3%	+0.7%	+0.5%	+0.8%	+0.6%
Sacramento Weir	-0.5%	-13.1%	-0.6%	-0.4%	-23.2%	-0.5%	-0.3%	-2.6%	-0.5%
Fremont Weir	0%	-0.3%	0%	0%	0%	0%	0%	+0.1%	0%
Yolo Byp. blw Sacramento Byp.	-0.1%	-2.8%	-0.1%	-0.1%	-3.8%	-0.1%	-0.3%	-0.4%	-0.1%

[1] Due to Sacramento Weir operation, flow at this location is bi-directional.

Table 18. Impact on Peak Flow – Project Alternative 5

Location	Impact on Peak Flow (%)								
	1% AEP			0.5% AEP			0.2% AEP		
	Existing to Current with Alt. 5	Existing to Future with Alt. 5	No Action to Future with Alt. 5	Existing to Current with Alt. 5	Existing to Future with Alt. 5	No Action to Future with Alt. 5	Existing to Current with Alt. 5	Existing to Future with Alt. 5	No Action to Future with Alt. 5
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Sacramento R. abv Sacramento Weir	+0.1%	+0.8%	+0.1%	+0.1%	+0.3%	+0.2%	+0.1%	+0.4%	+0.2%
Sacramento R. blw Sacramento Weir[1]									
peak flow in downstream direction	+0.1%	+0.1%	+0.1%	+0.1%	+0.1%	+0.1%	+0.1%	+0.1%	+0.1%
peak flow in upstream direction	-3.2%	-61.9%	-7.1%	-1.5%	-59.2%	-3.0%	-1.3%	-13.2%	-2.0%
Sacramento R. blw American R.	+0.9%	-2.2%	+0.8%	+1.1%	-9.4%	+0.9%	+1.2%	-3.4%	+1.7%
Sacramento R. at Freeport	+0.8%	-2.3%	+0.8%	+0.8%	-7.1%	+0.9%	+0.7%	+0.9%	+0.7%
Sacramento Weir	-0.7%	-13.3%	-0.8%	-0.5%	-23.3%	-0.7%	-0.4%	-2.8%	-0.7%
Fremont Weir	0%	-0.3%	0%	0%	0%	0%	0%	+0.1%	0%
Yolo Byp. blw Sacramento Byp.	-0.2%	-2.8%	-0.2%	-0.2%	-3.8%	-0.2%	-0.4%	-0.4%	-0.1%

[1] Due to Sacramento Weir operation, flow at this location is bi-directional.

Table 19. Impact on Peak Flow – Existing to No Action			
Location	**Impact on Peak Flow (%)**		
	1% AEP	**0.5% AEP**	**0.2% AEP**
	[1]	[2]	[3]
Sacramento R. abv Sacramento Weir	+0.8%	+0.2%	+0.2%
Sacramento R. blw Sacramento Weir[1]			
peak flow in downstream direction	0%	0%	0%
peak flow in upstream direction	-59.0%	-58.0%	-11.4%
Sacramento R. blw American R.	-3.0%	-10.2%	-5.0%
Sacramento R. at Freeport	-3.1%	-7.9%	+0.2%
Sacramento Weir	-12.6%	-22.8%	-2.2%
Fremont Weir	-0.3%	0%	+0.1%
Yolo Byp. blw Sacramento Byp.	-2.6%	-3.7%	-0.3%

[1] Due to Sacramento Weir operation, flow at this location is bi-directional.

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Figure 130. Maximum Water Surface Elevation Impacts; Deep Water Ship Channel; Alternative 5; 0.2% AEP 105

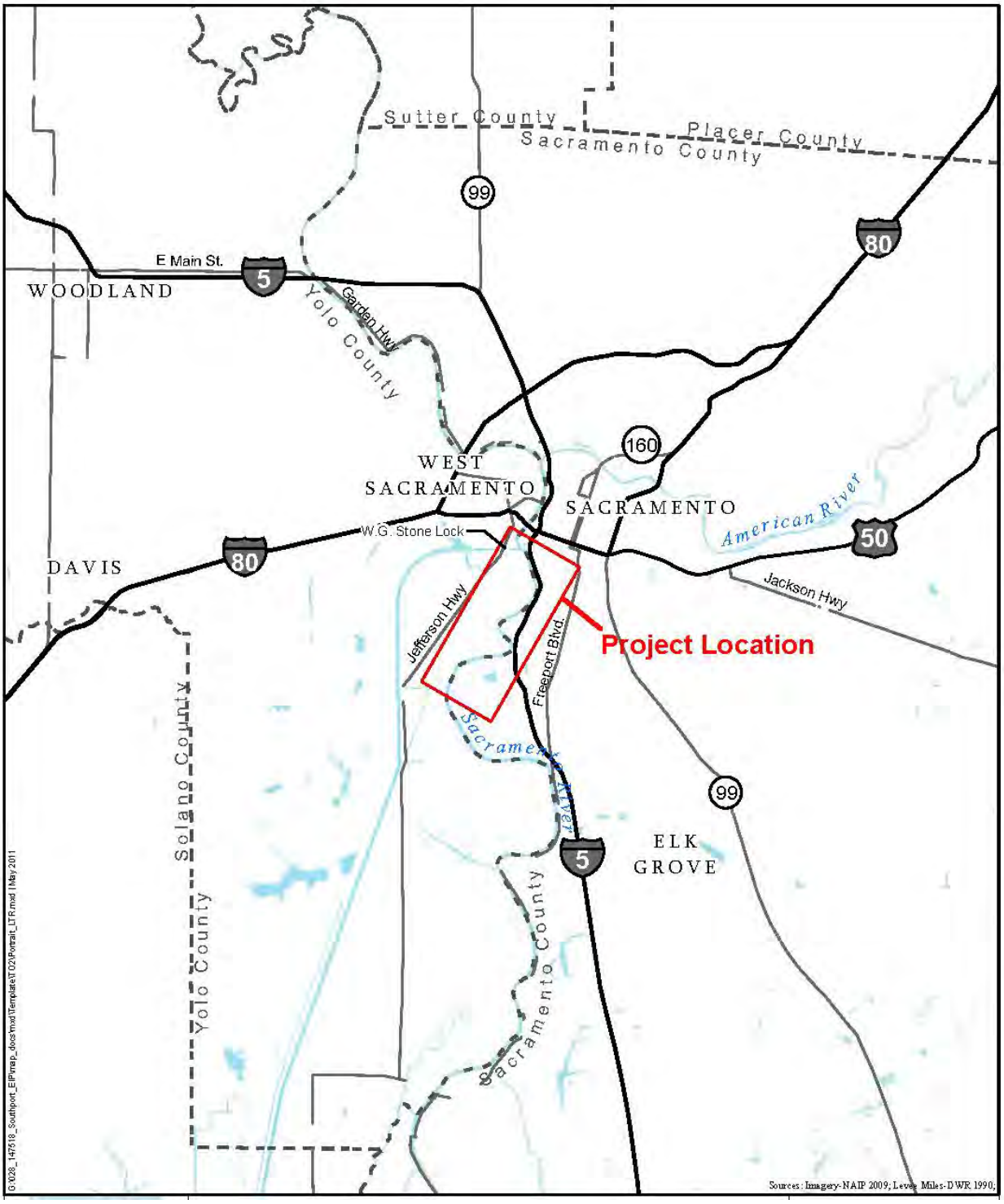


Figure 1. Project Location Map

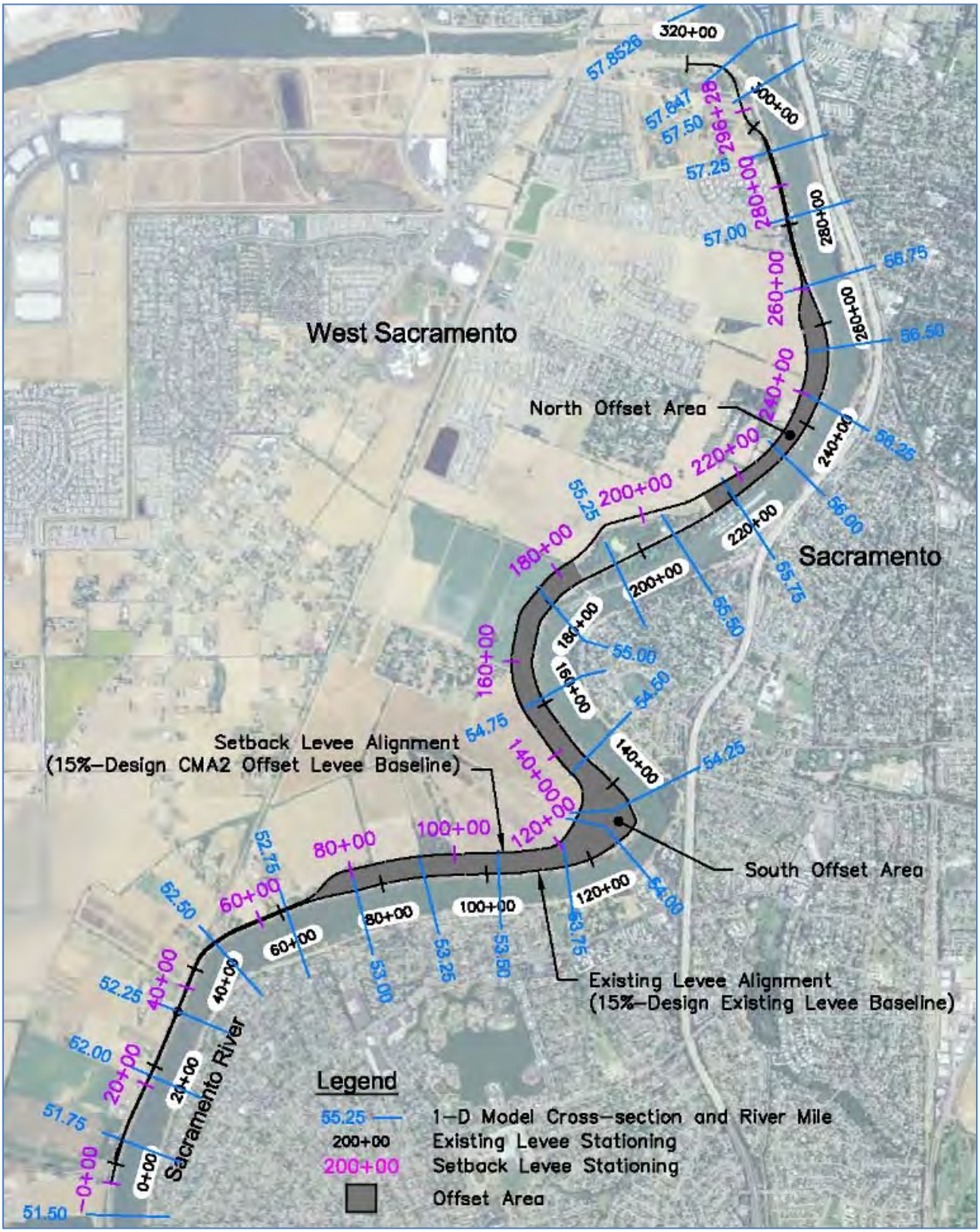


Figure 2. Site Map with River Mile Stations

Figure 3. USACE Sacramento River HEC-RAS Model Extents (Source: USACE)

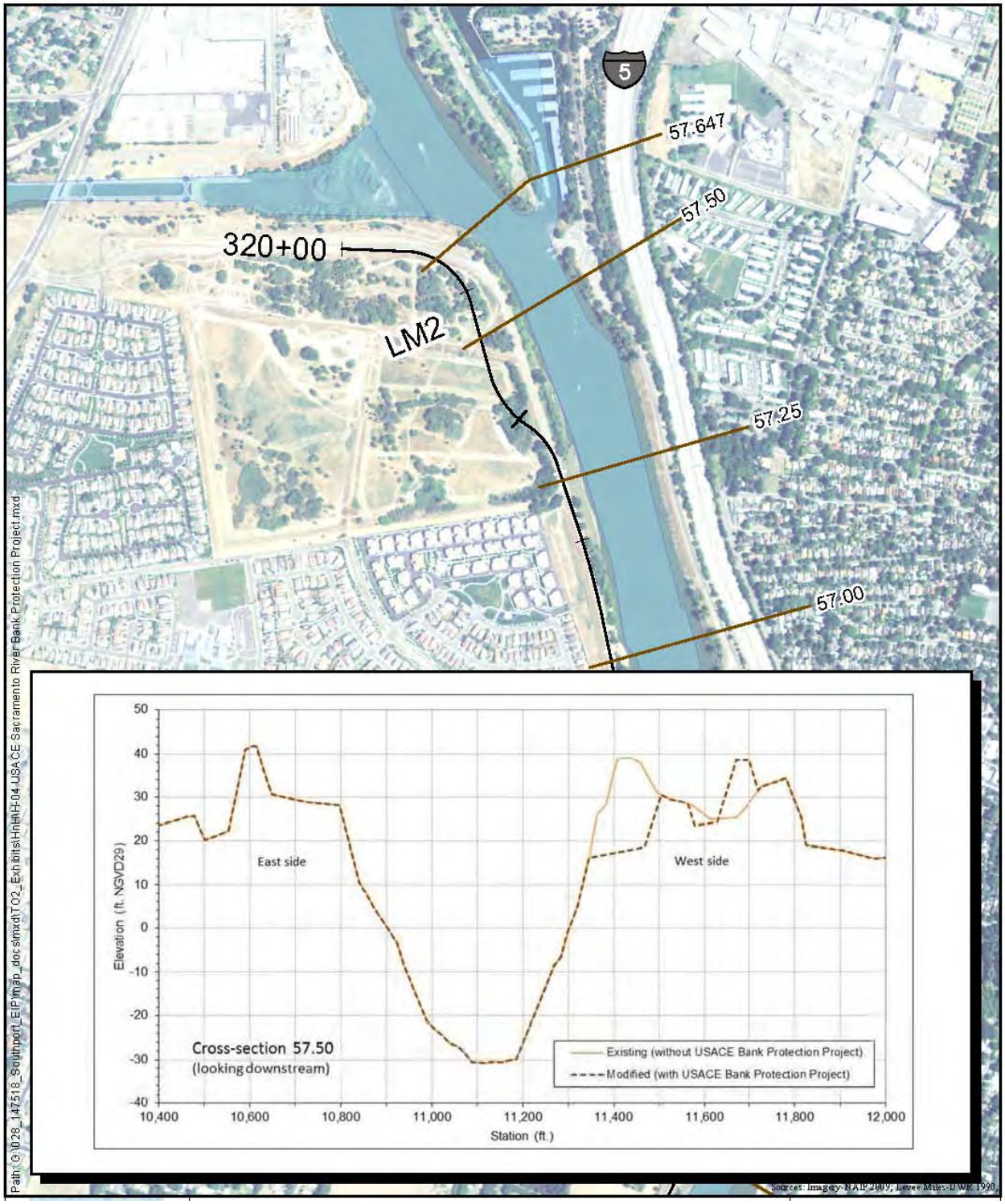


Figure 4. USACE Sacramento River Bank Protection Project Erosion Repair Site RM 57.2R

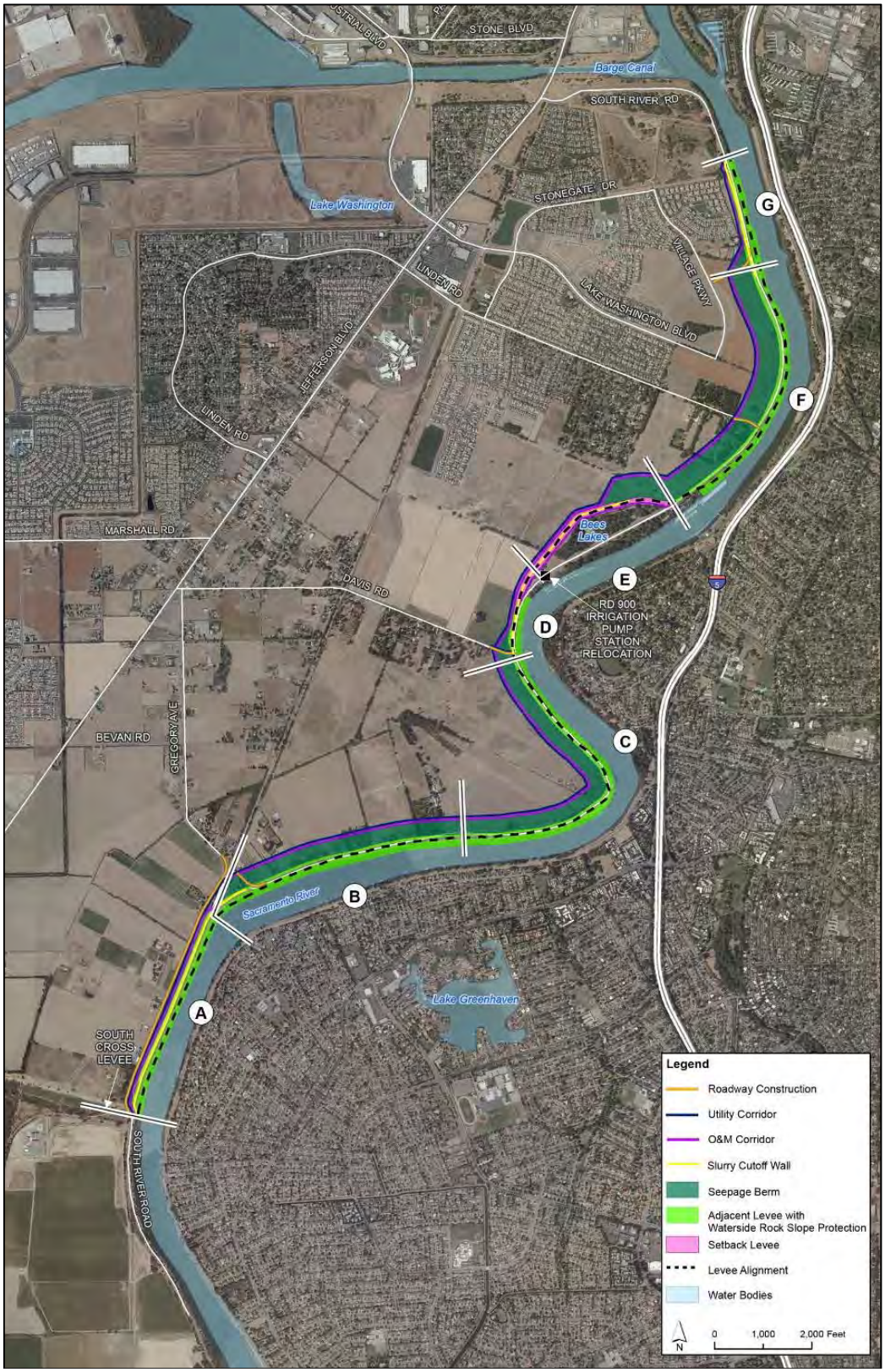


Figure 5. With Project, Alternative 1 (Source: ICF International)

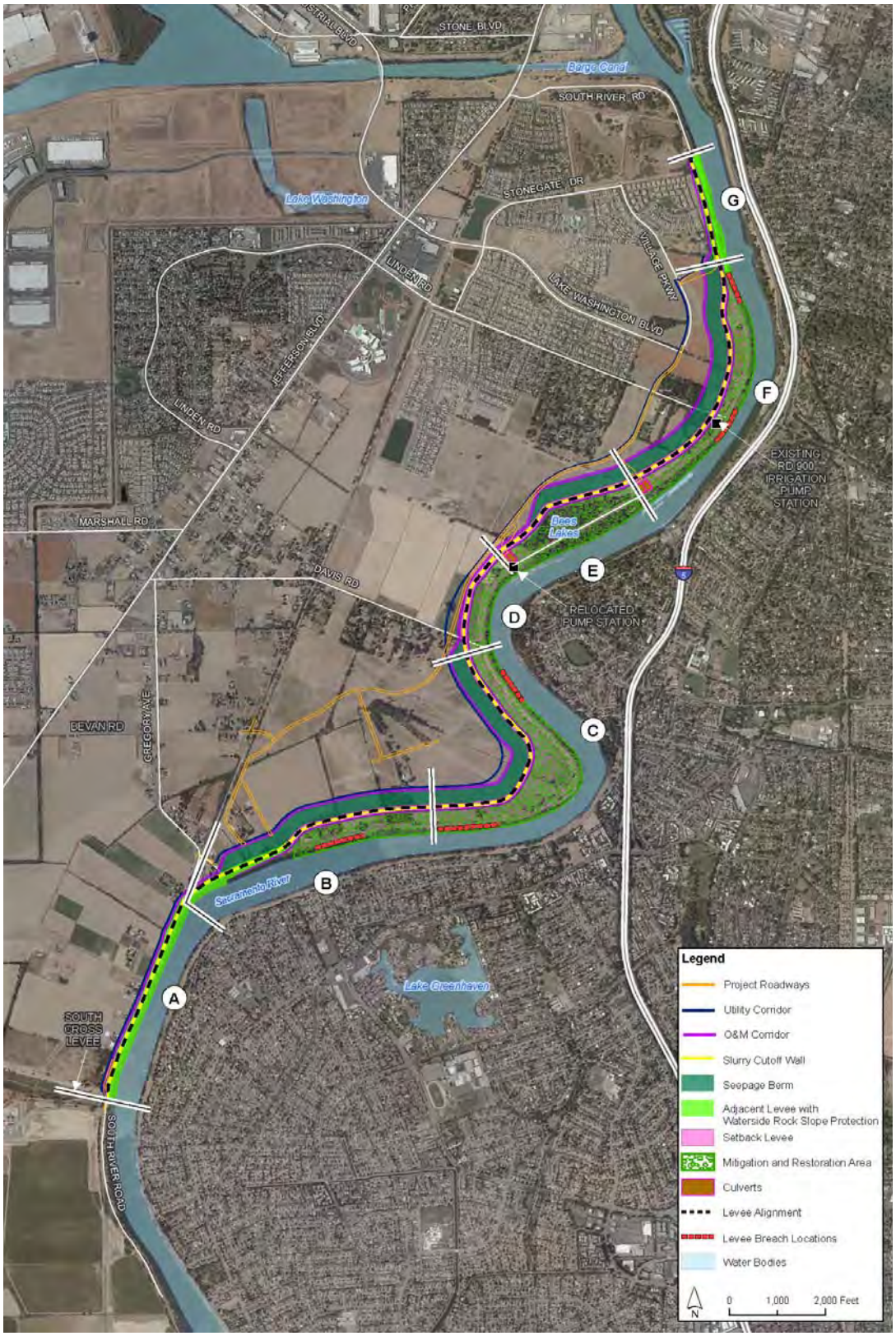


Figure 6. With Project, Alternative 2 (Source: ICF International)

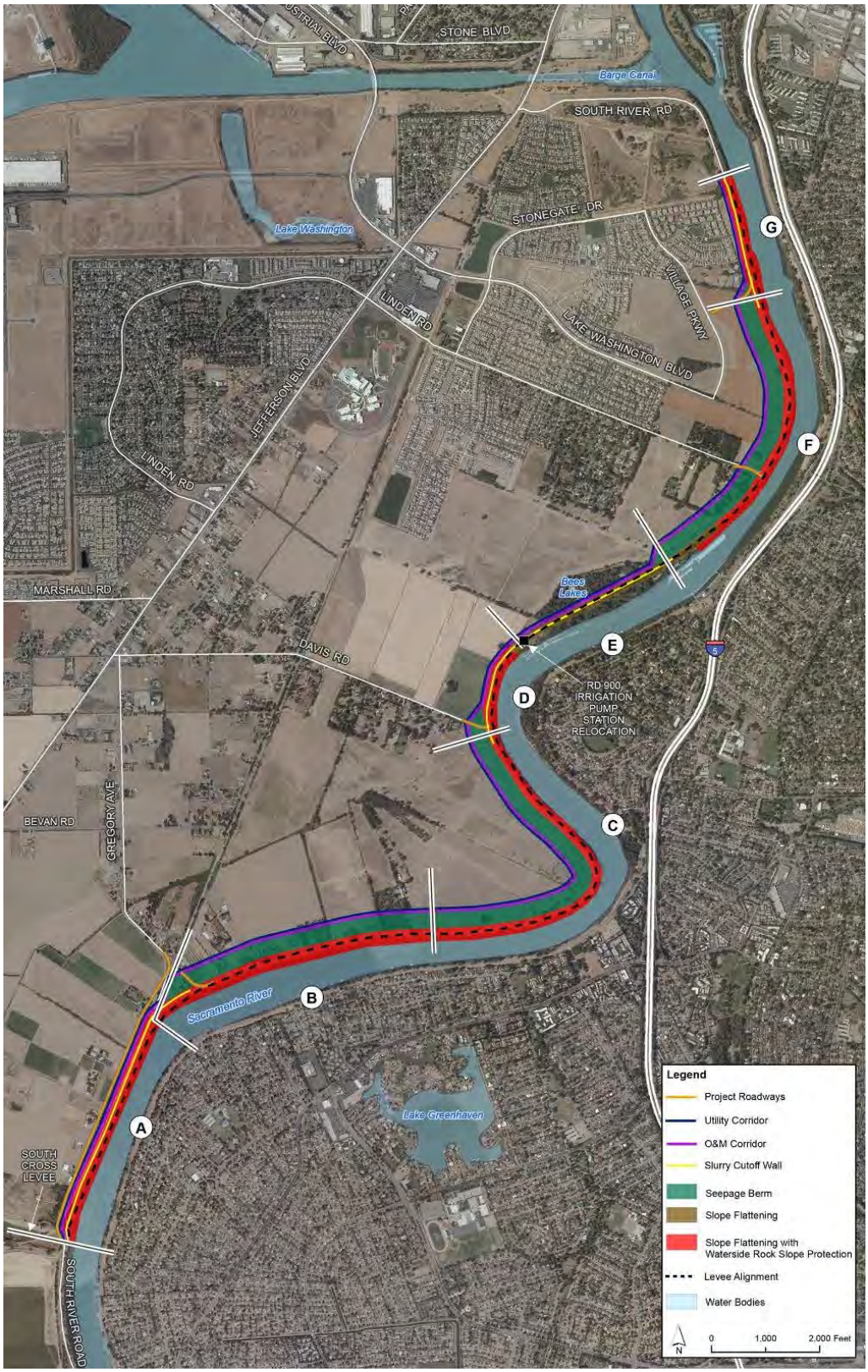


Figure 7. With Project, Alternative 3 (Source: ICF International)

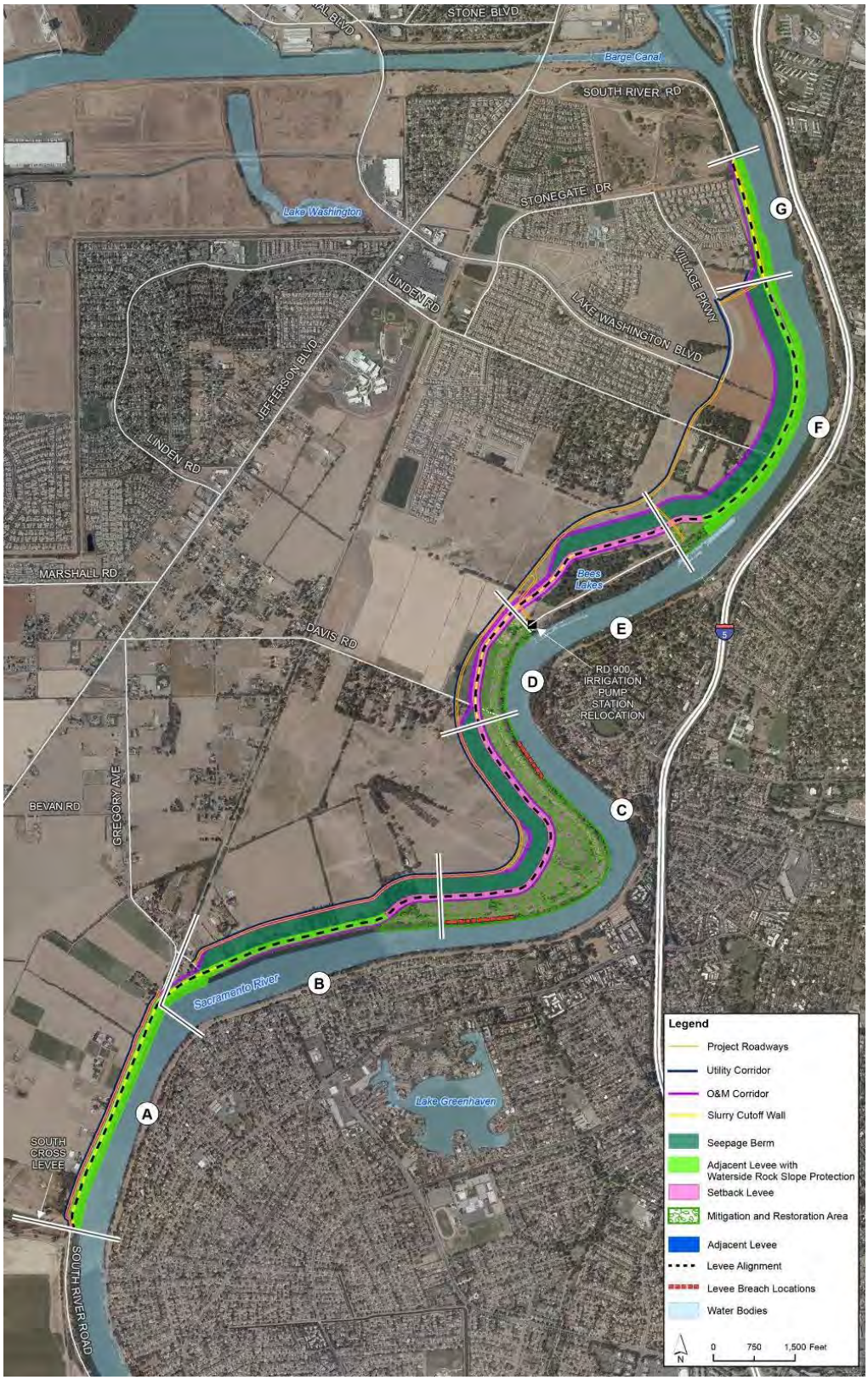


Figure 8. With Project, Alternative 4 (Source: ICF International)

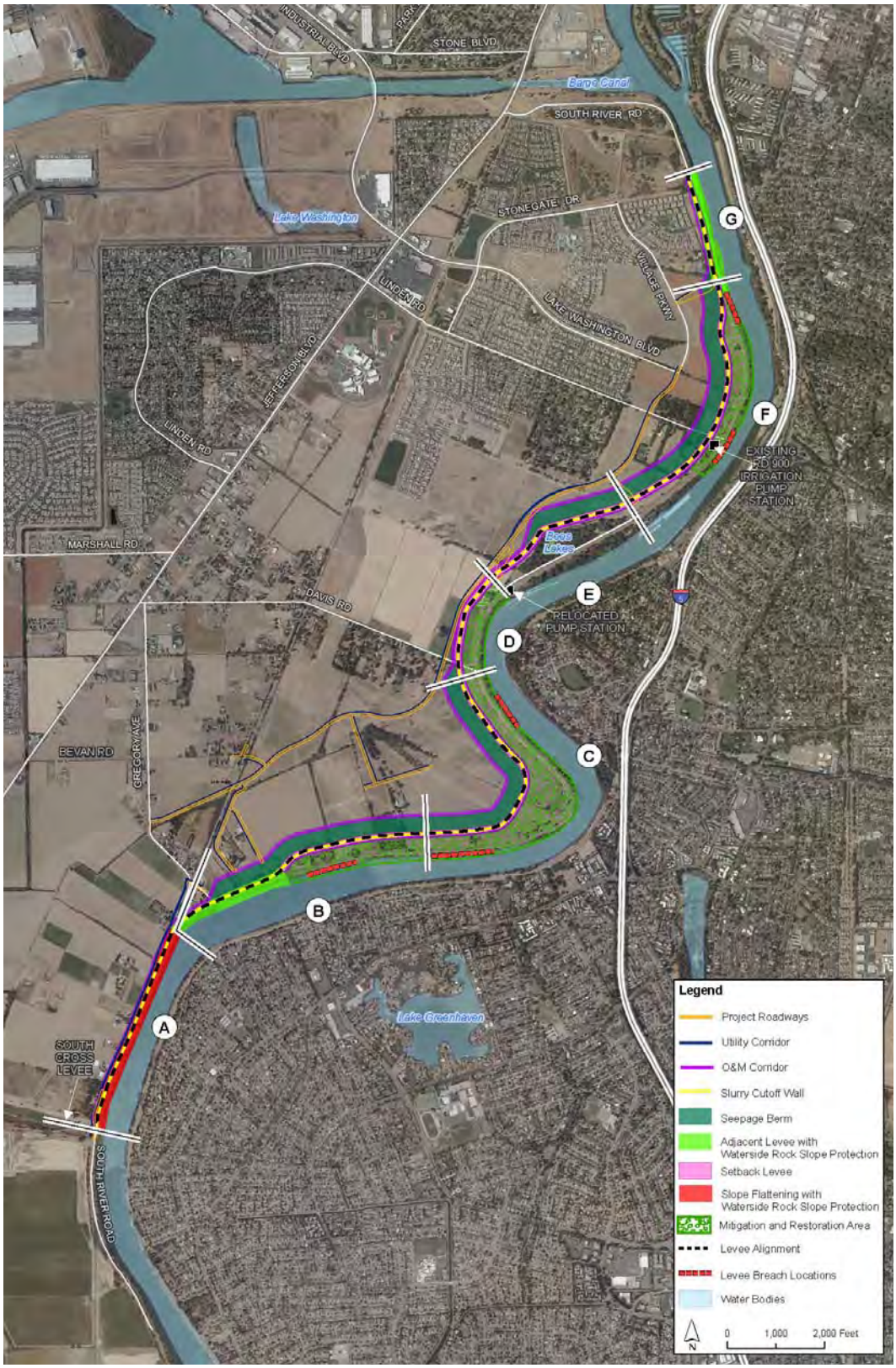


Figure 9. With Project, Alternative 5 (Source: ICF International)

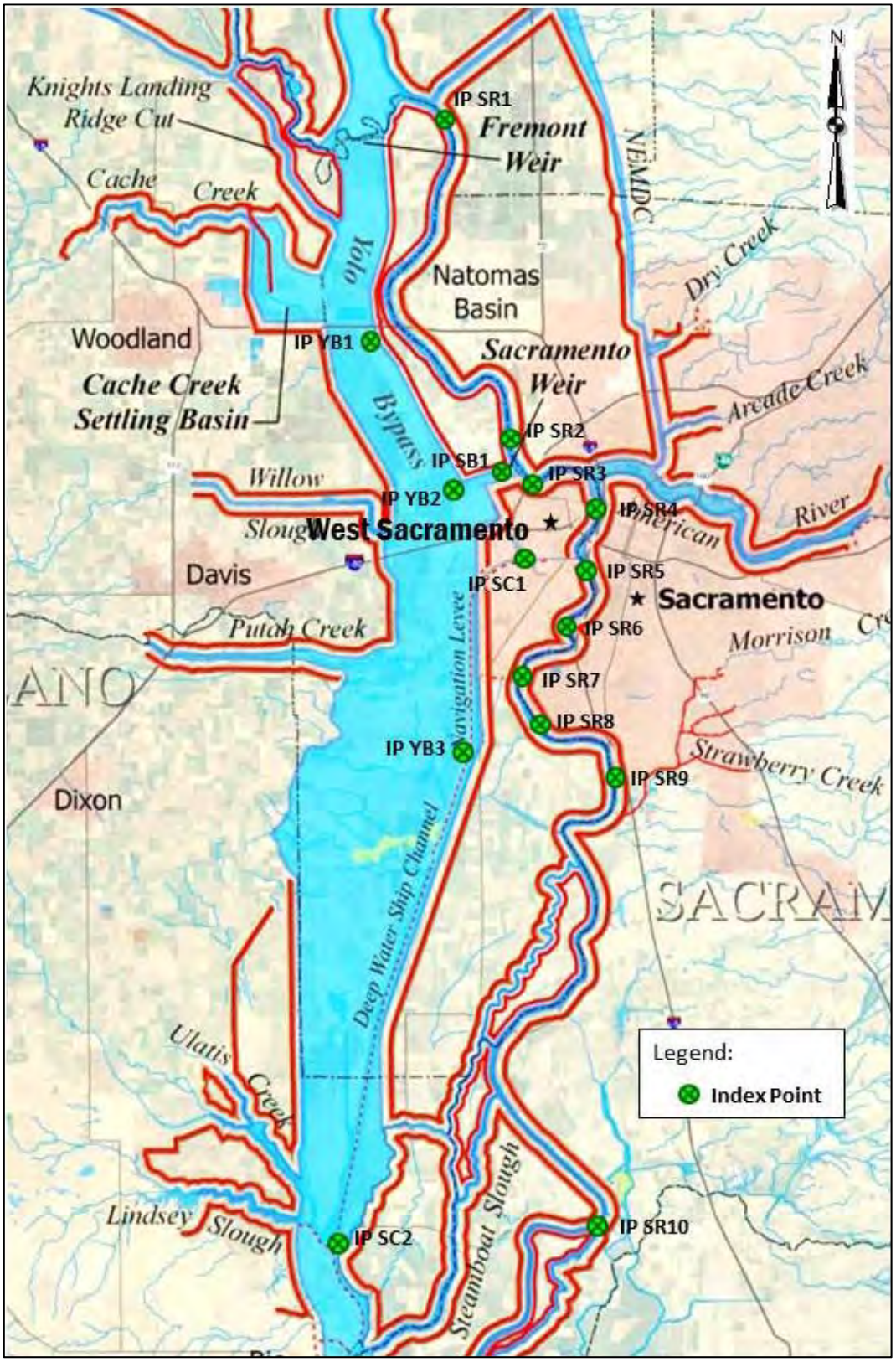


Figure 10. Index Point Locations

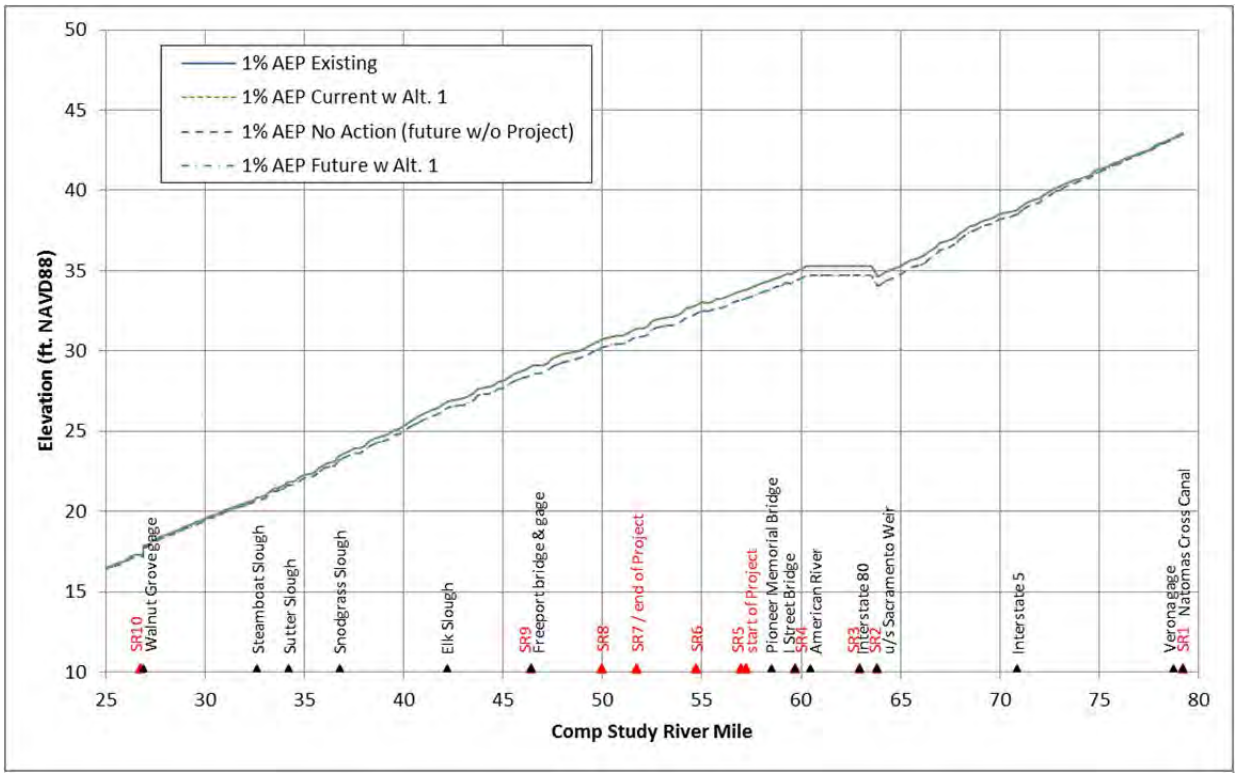


Figure 11. Maximum Water Surface Elevations; Sacramento River; Alternative 1; 1% AEP

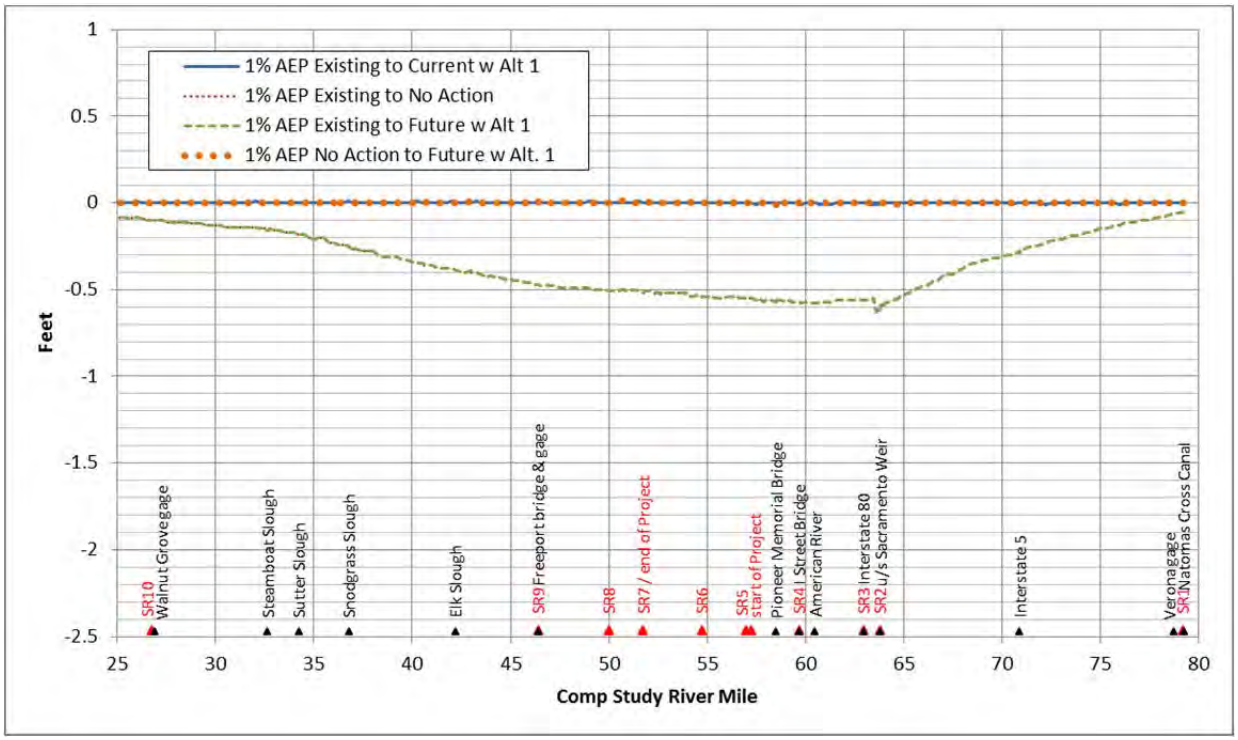


Figure 12. Maximum Water Surface Elevation Impacts; Sacramento River; Alternative 1; 1% AEP

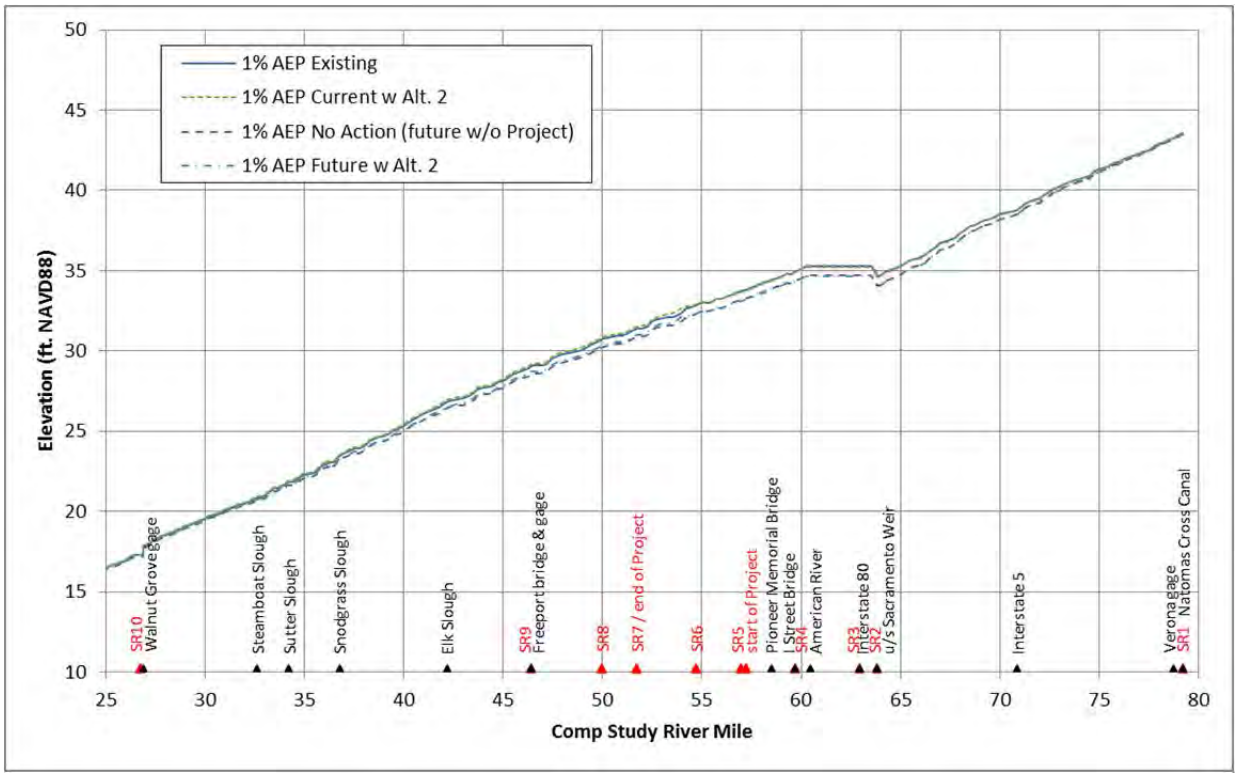


Figure 13. Maximum Water Surface Elevations; Sacramento River; Alternative 2; 1% AEP

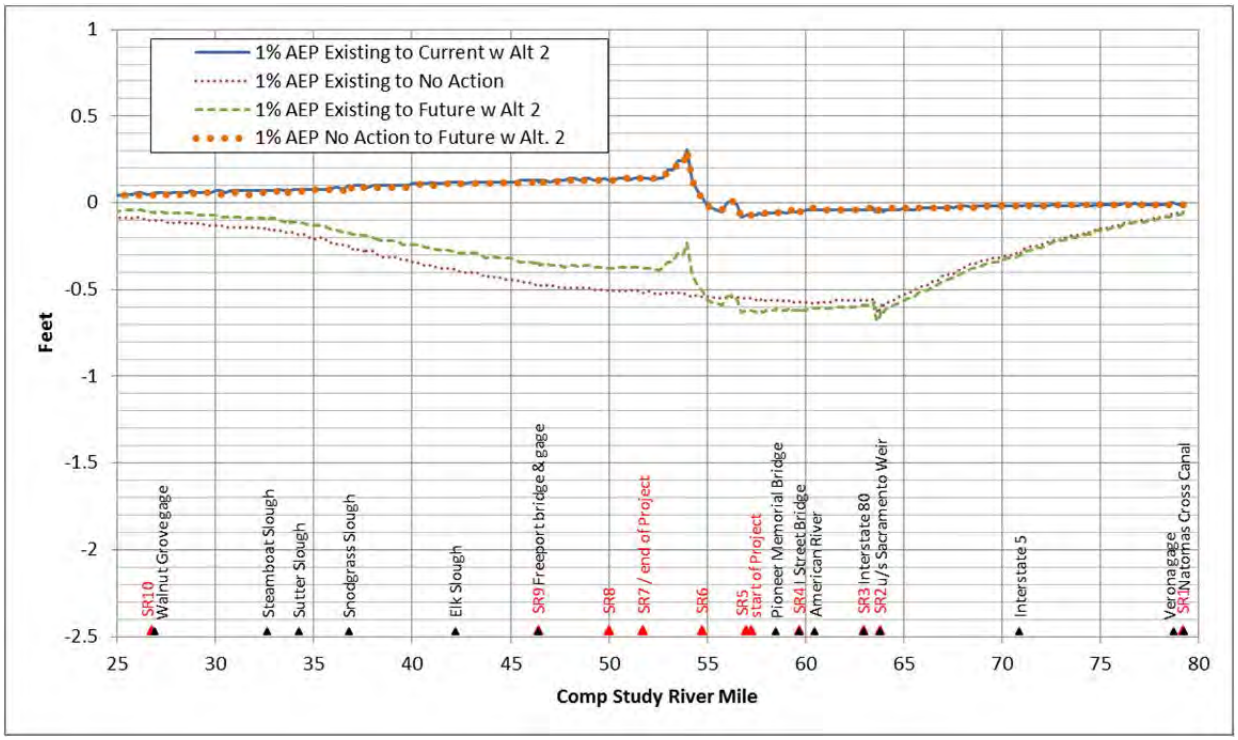


Figure 14. Maximum Water Surface Elevation Impacts; Sacramento River; Alternative 2; 1% AEP

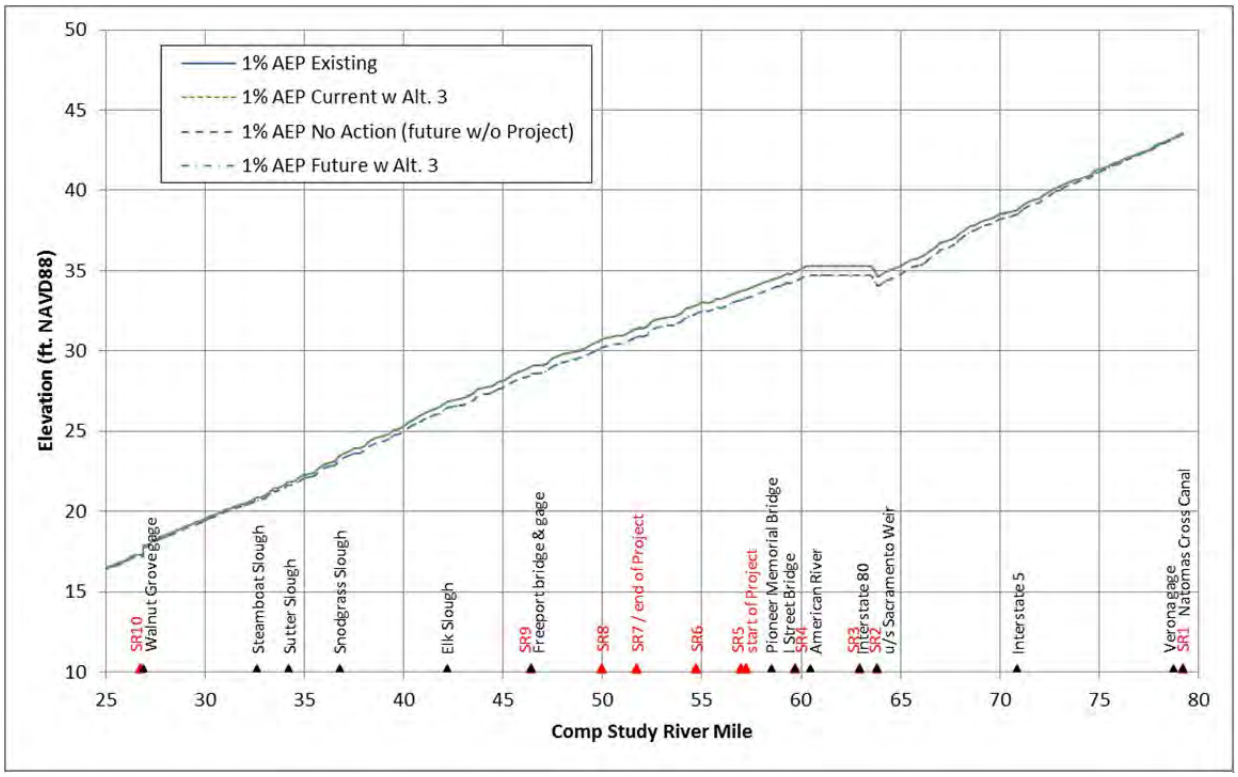


Figure 15. Maximum Water Surface Elevations; Sacramento River; Alternative 3; 1% AEP

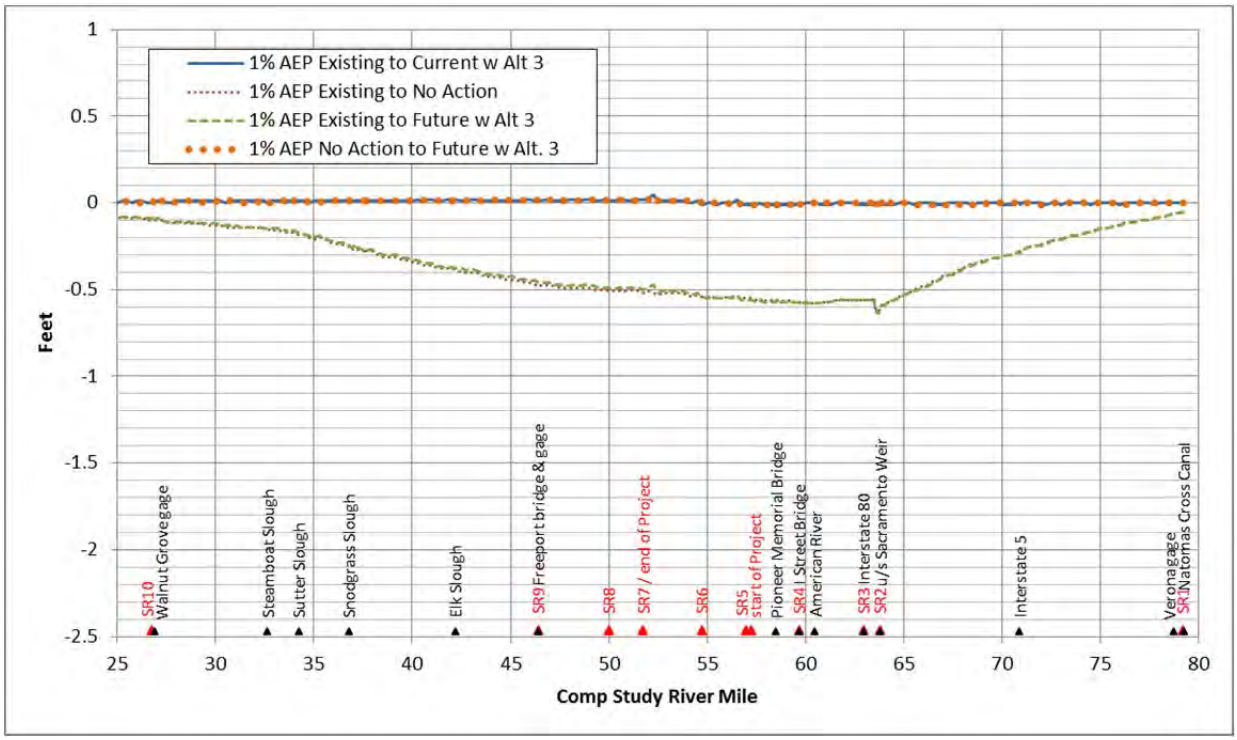


Figure 16. Maximum Water Surface Elevation Impacts; Sacramento River; Alternative 3; 1% AEP

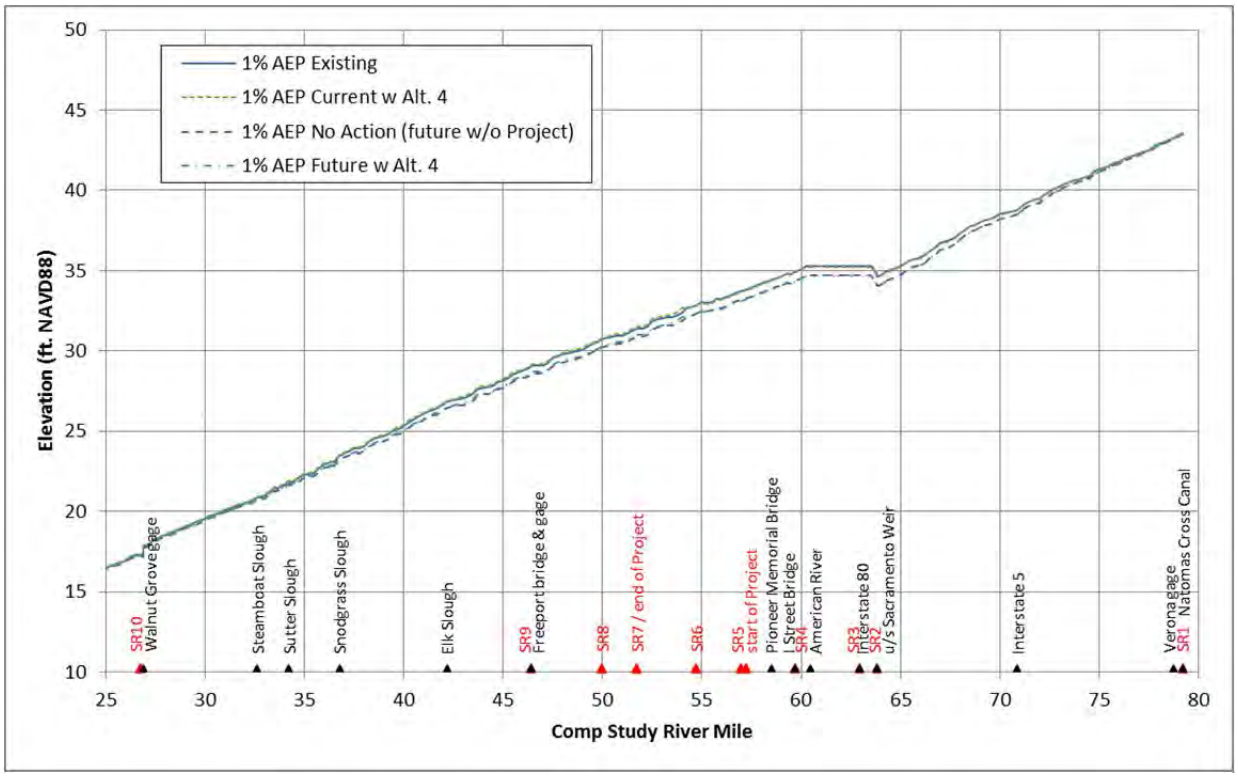


Figure 17. Maximum Water Surface Elevations; Sacramento River; Alternative 4; 1% AEP

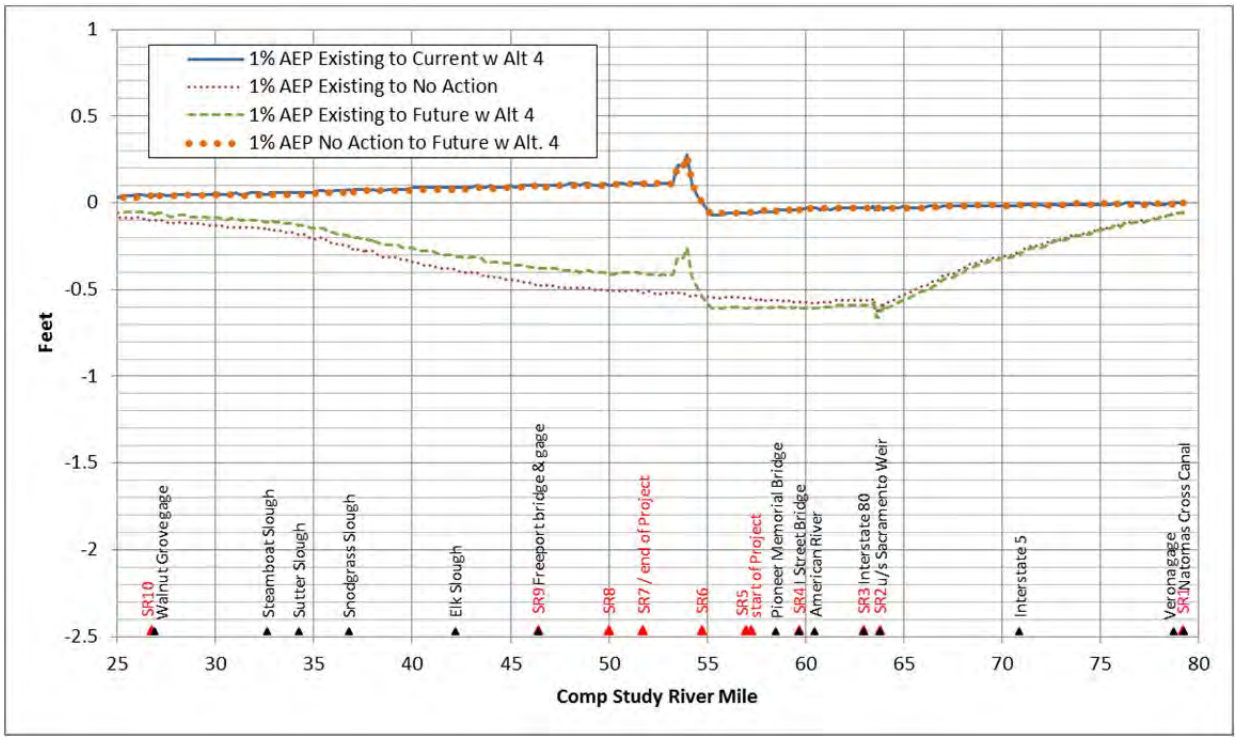


Figure 18. Maximum Water Surface Elevation Impacts; Sacramento River; Alternative 4; 1% AEP

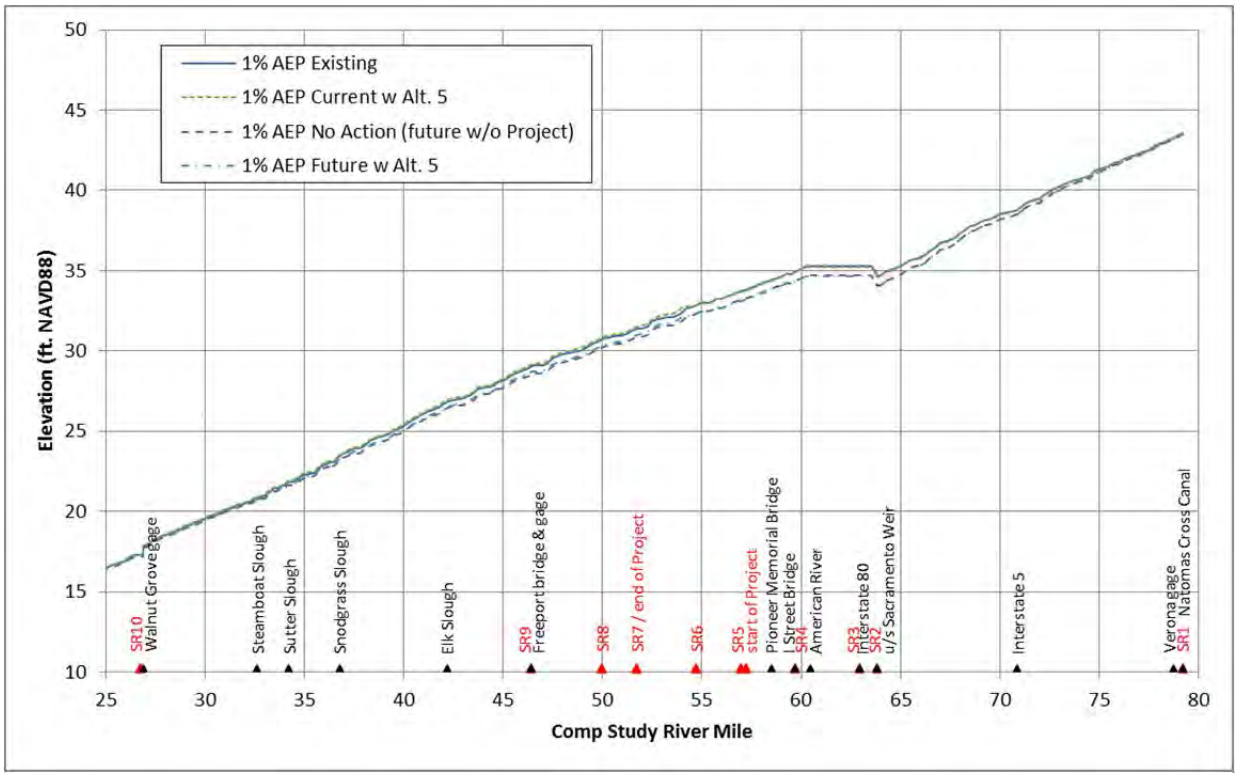


Figure 19. Maximum Water Surface Elevations; Sacramento River; Alternative 5; 1% AEP

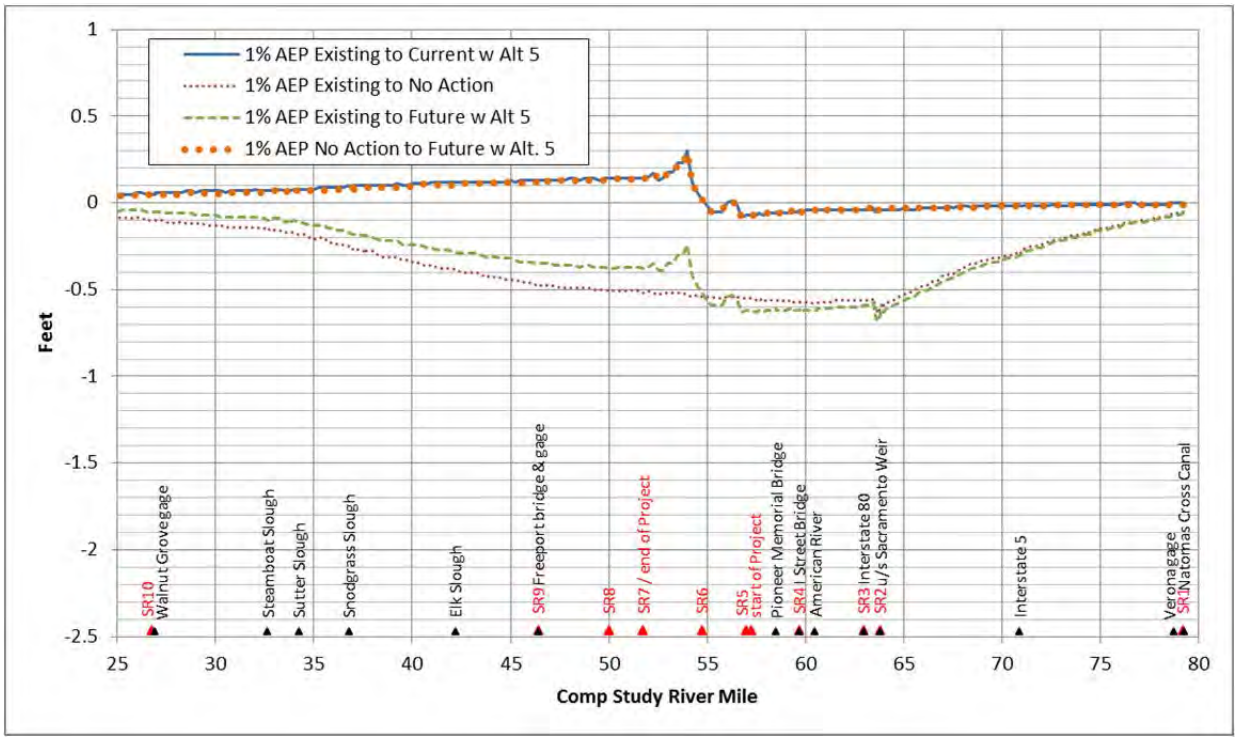


Figure 20. Maximum Water Surface Elevation Impacts; Sacramento River; Alternative 5; 1% AEP

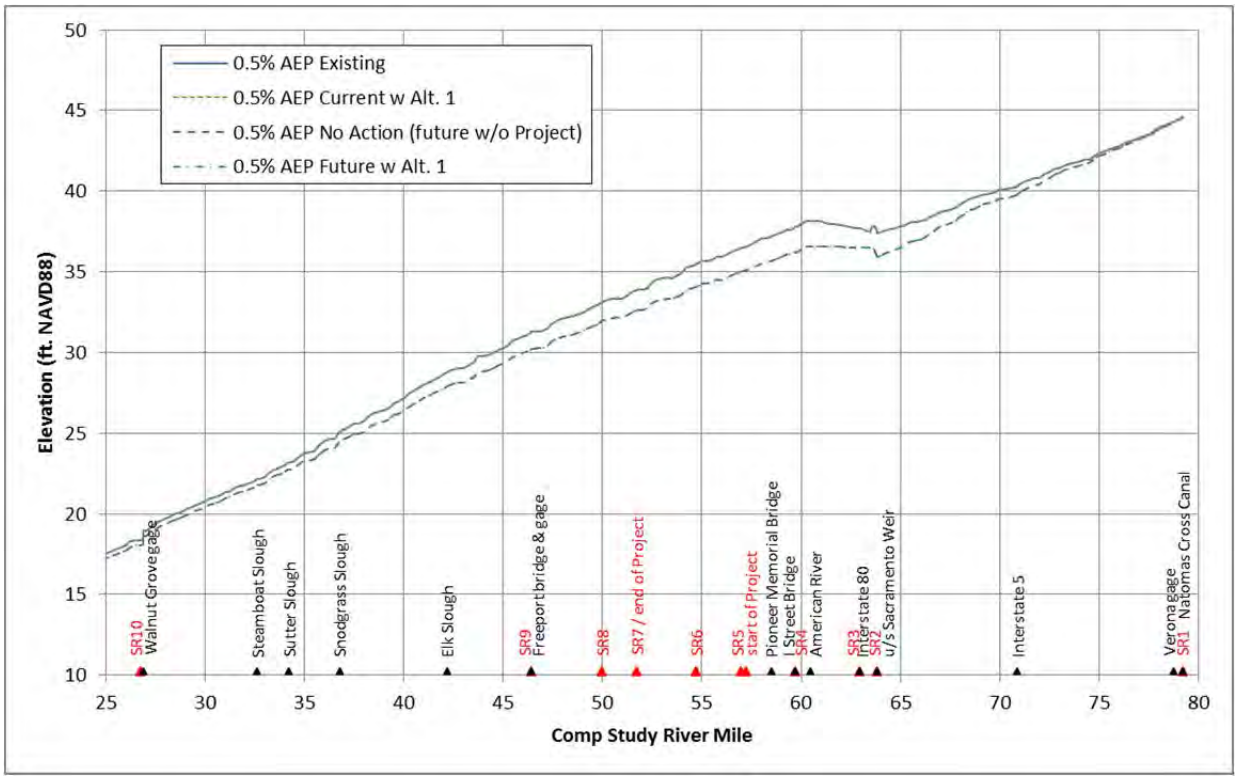


Figure 21. Maximum Water Surface Elevations; Sacramento River; Alternative 1; 0.5% AEP

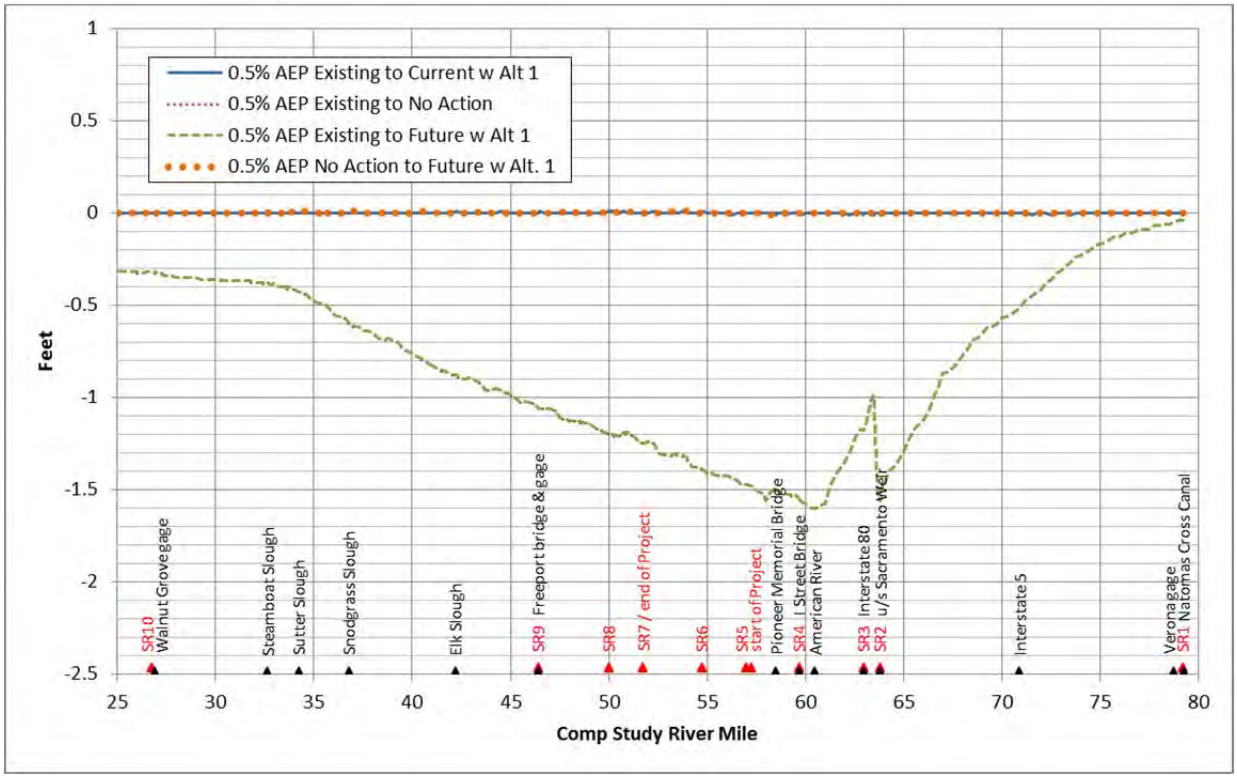


Figure 22. Maximum Water Surface Elevation Impacts; Sacramento River; Alternative 1; 0.5% AEP

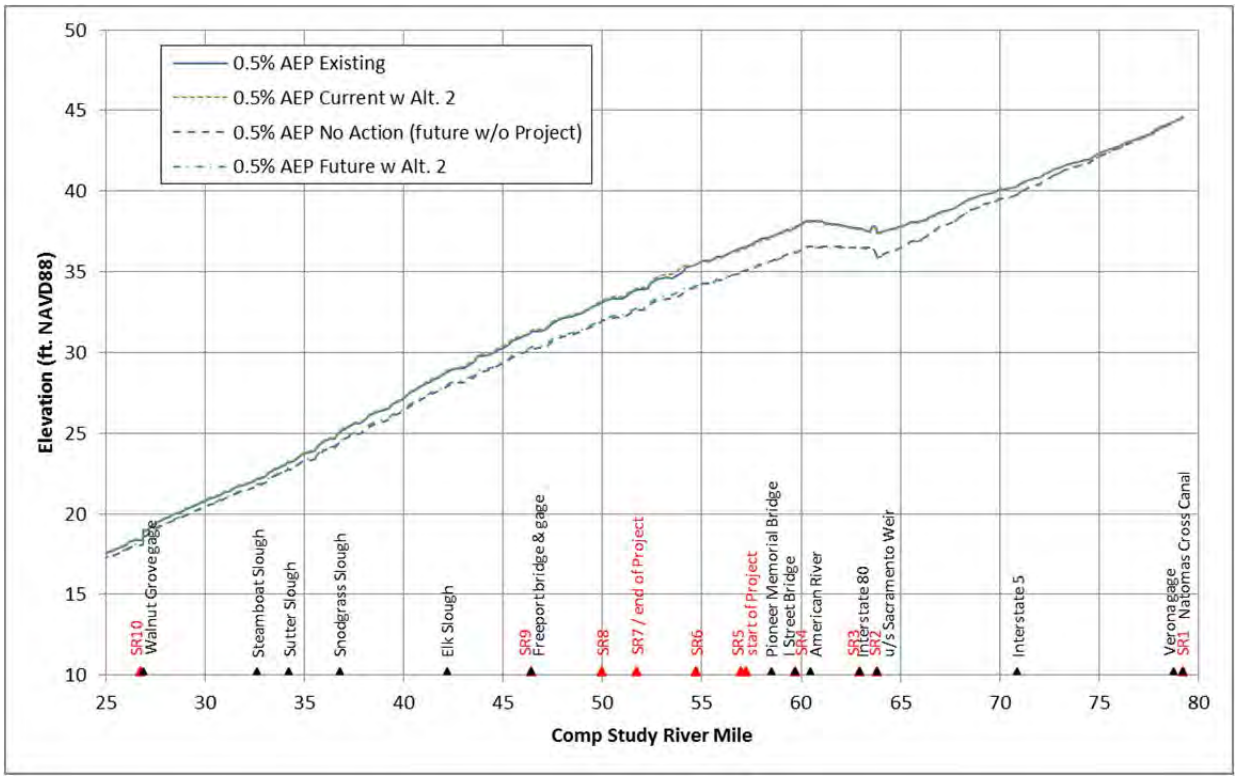


Figure 23. Maximum Water Surface Elevations; Sacramento River; Alternative 2; 0.5% AEP

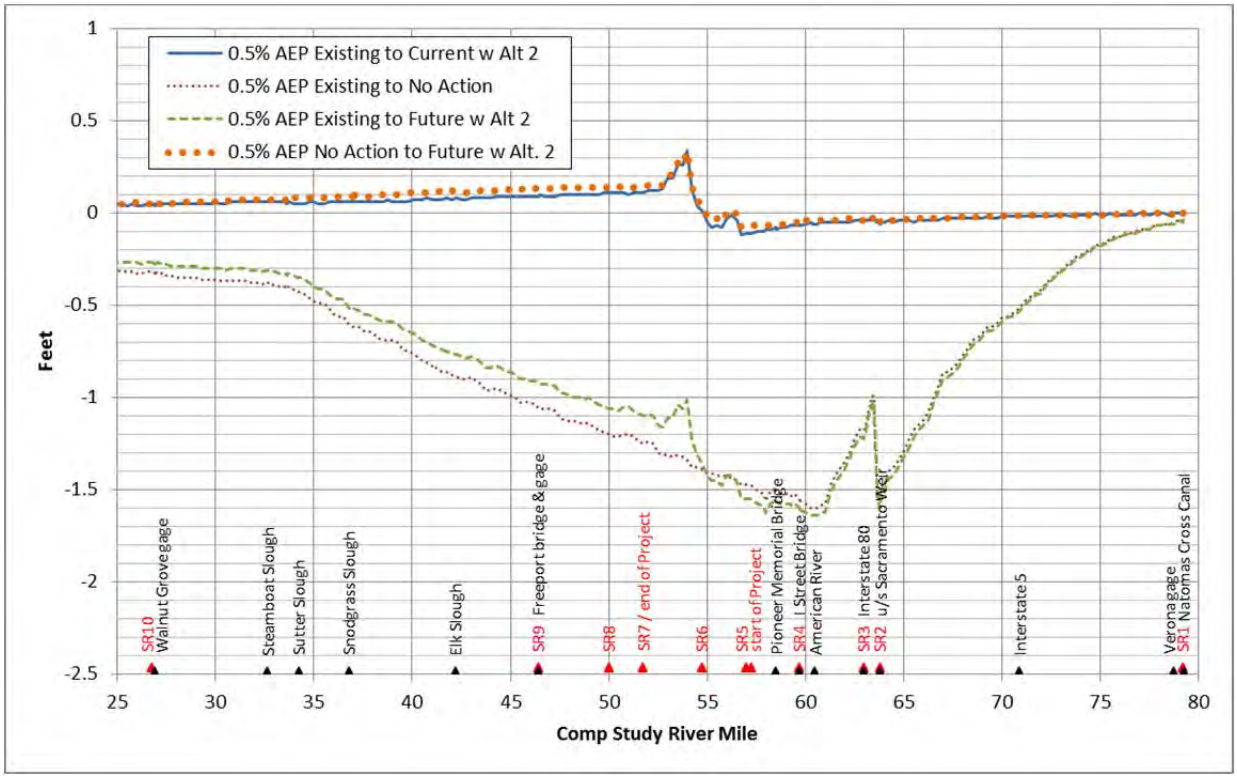


Figure 24. Maximum Water Surface Elevation Impacts; Sacramento River; Alternative 2; 0.5% AEP

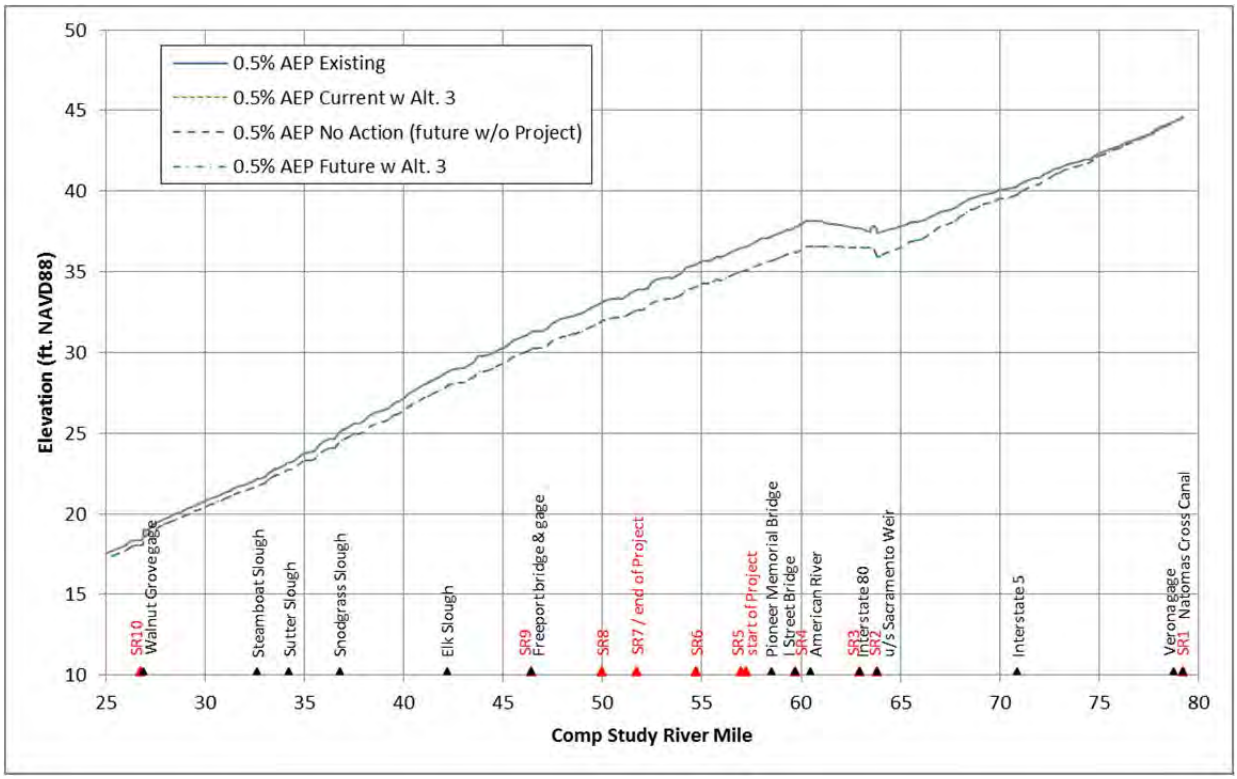


Figure 25. Maximum Water Surface Elevations; Sacramento River; Alternative 3; 0.5% AEP

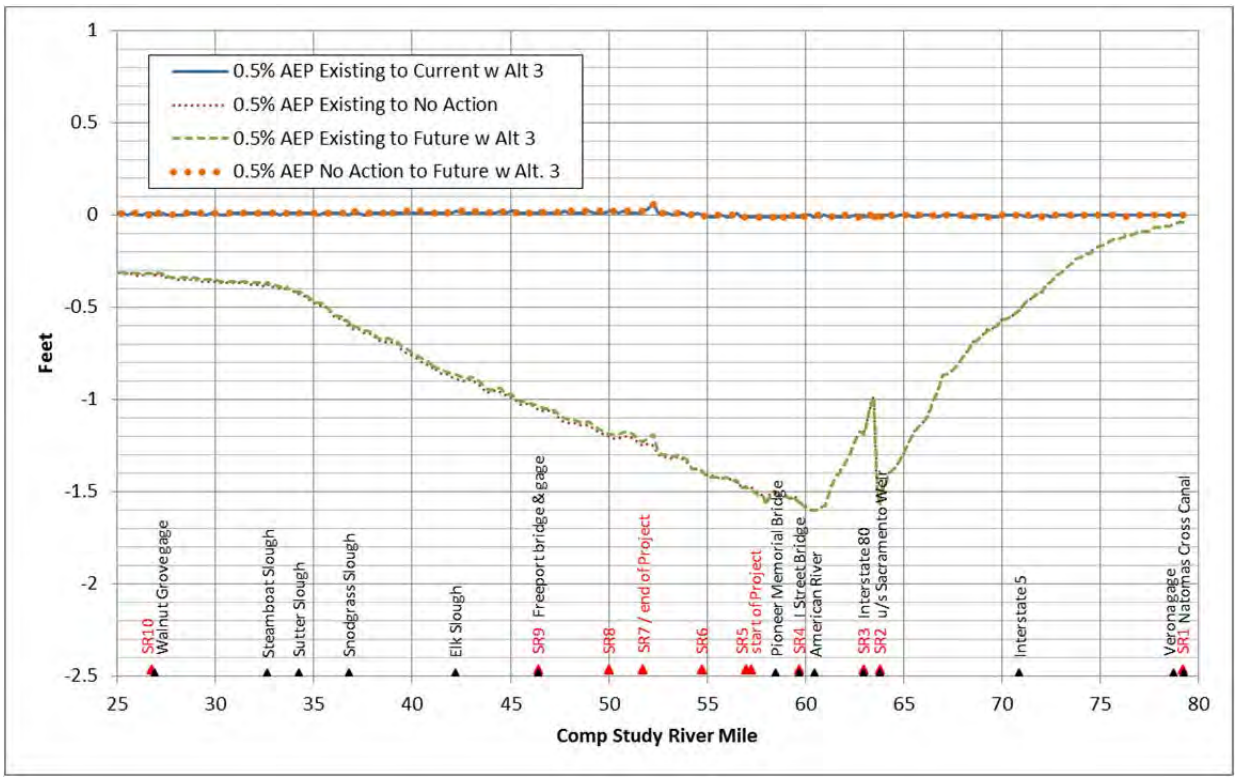


Figure 26. Maximum Water Surface Elevation Impacts; Sacramento River; Alternative 3; 0.5% AEP

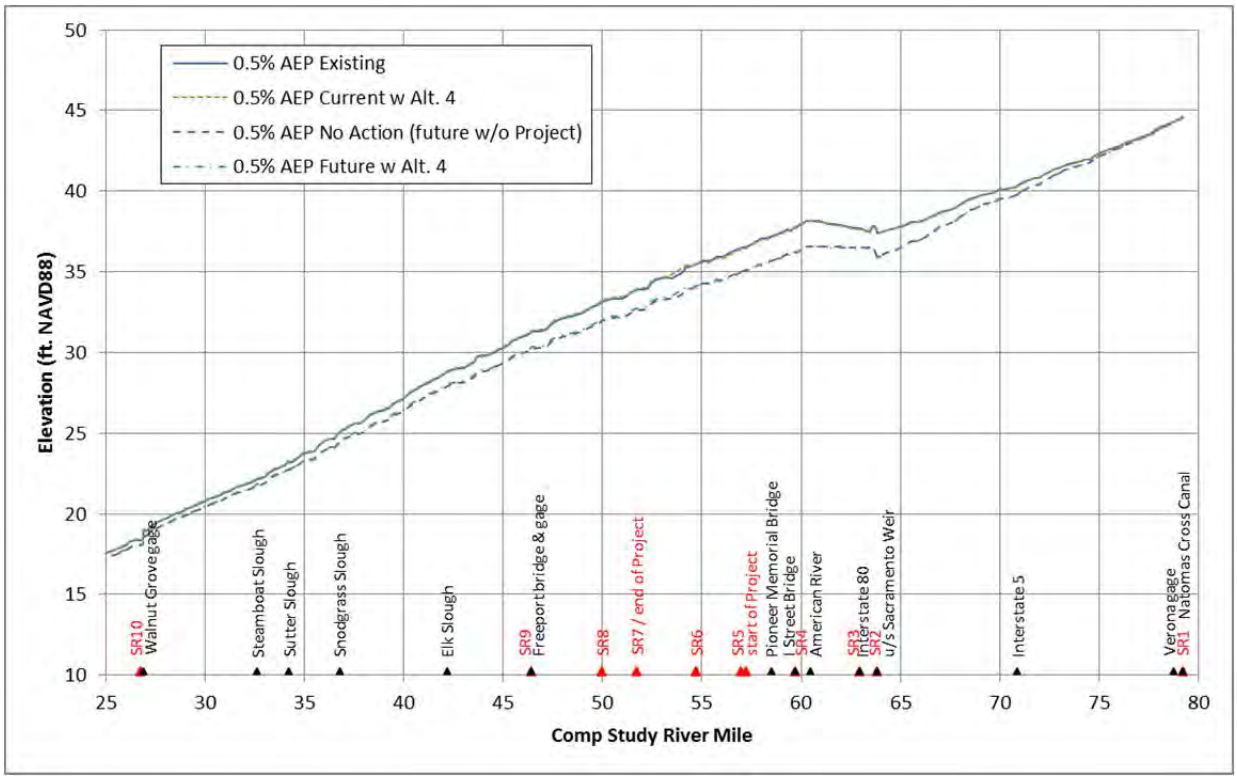


Figure 27. Maximum Water Surface Elevations; Sacramento River; Alternative 4; 0.5% AEP

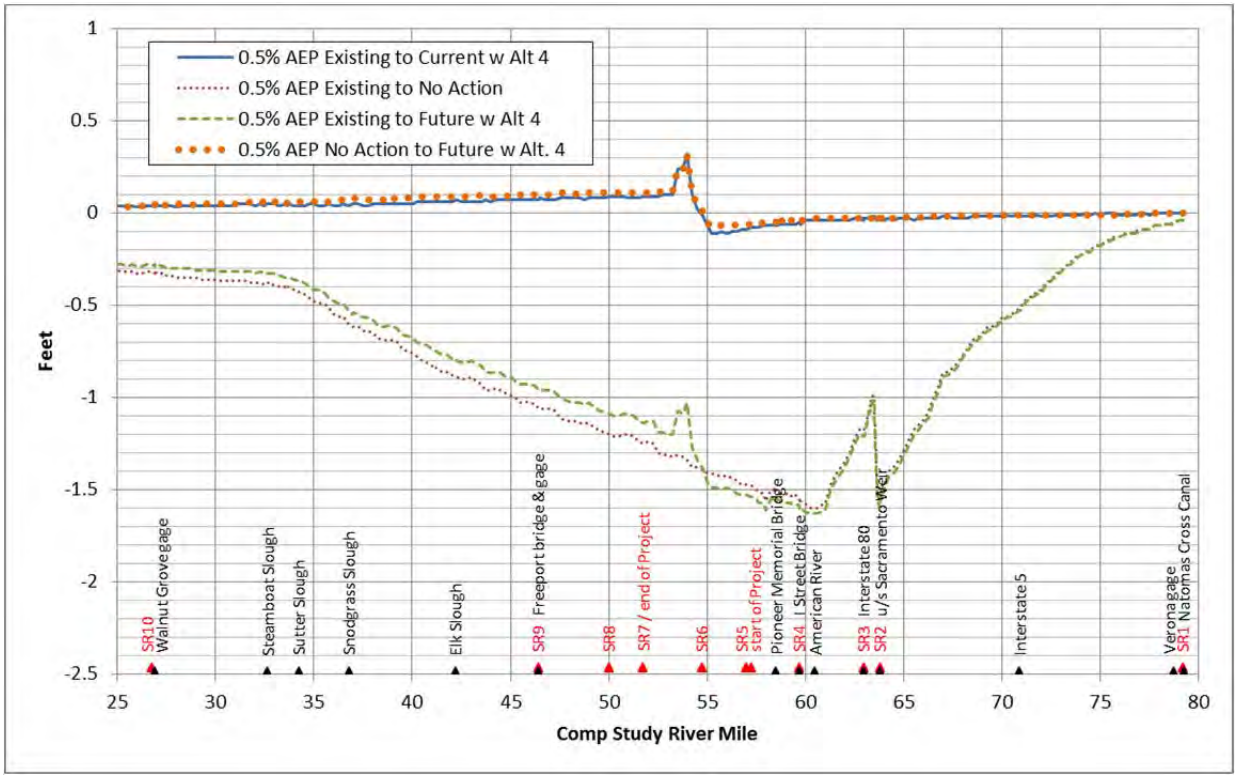


Figure 28. Maximum Water Surface Elevation Impacts; Sacramento River; Alternative 4; 0.5% AEP

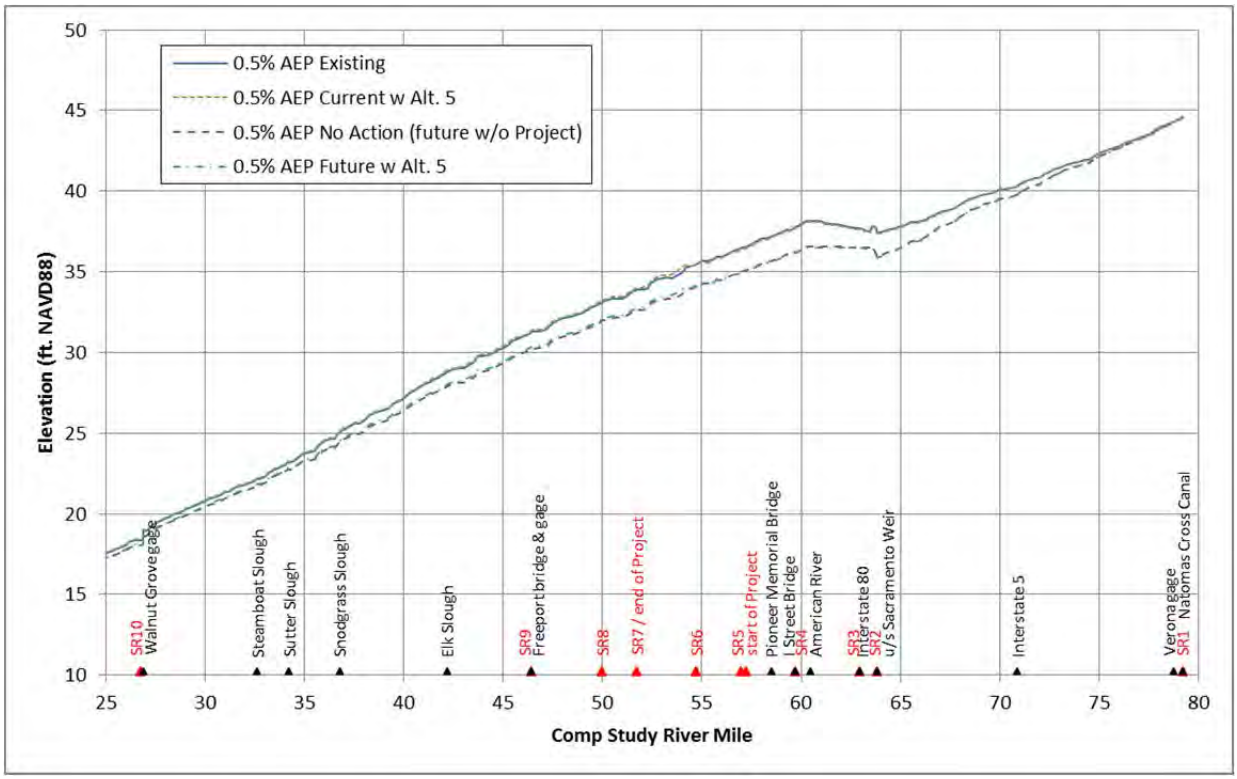


Figure 29. Maximum Water Surface Elevations; Sacramento River; Alternative 5; 0.5% AEP

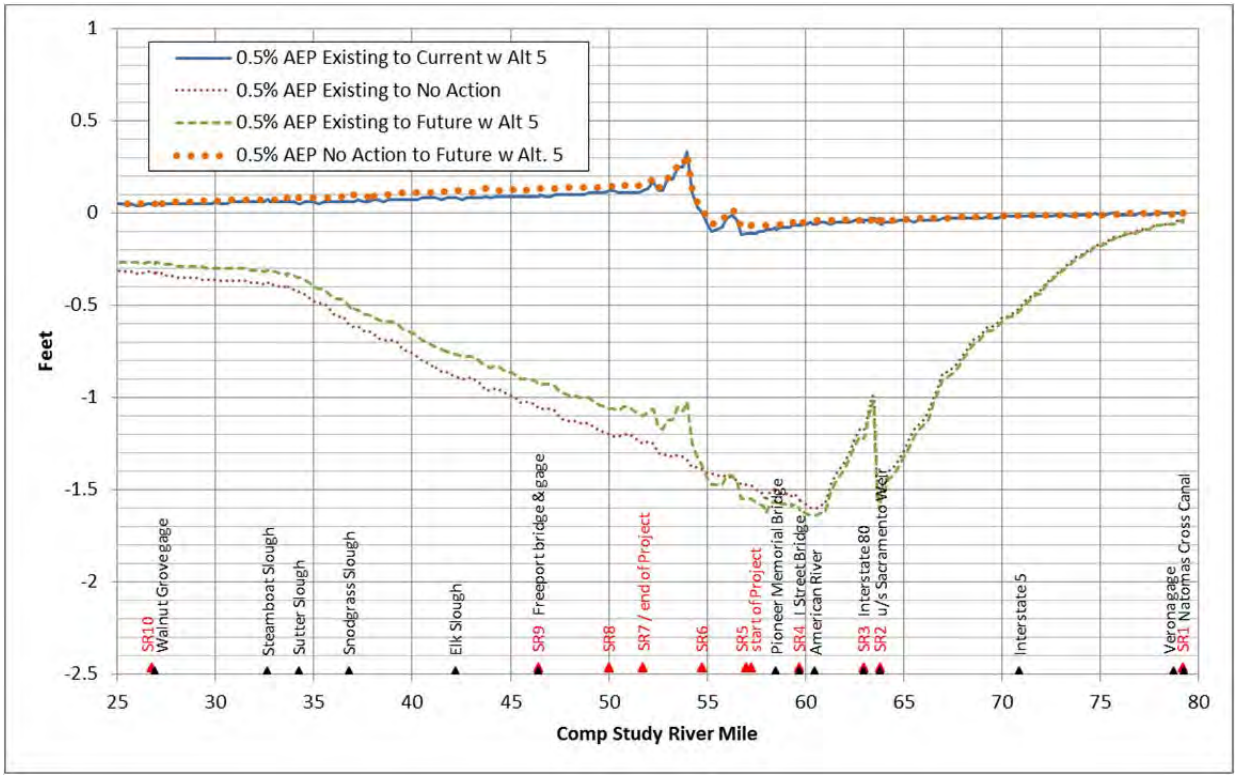


Figure 30. Maximum Water Surface Elevation Impacts; Sacramento River; Alternative 5; 0.5% AEP

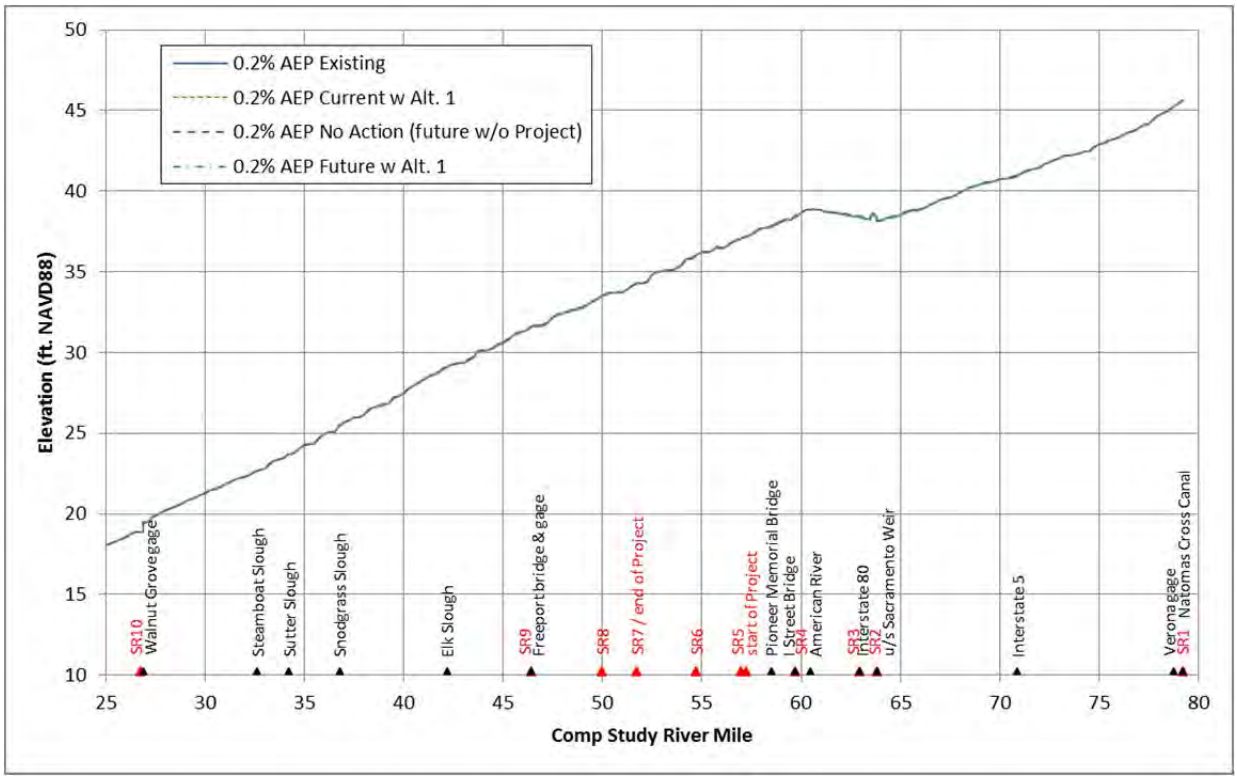


Figure 31. Maximum Water Surface Elevations; Sacramento River; Alternative 1; 0.2% AEP

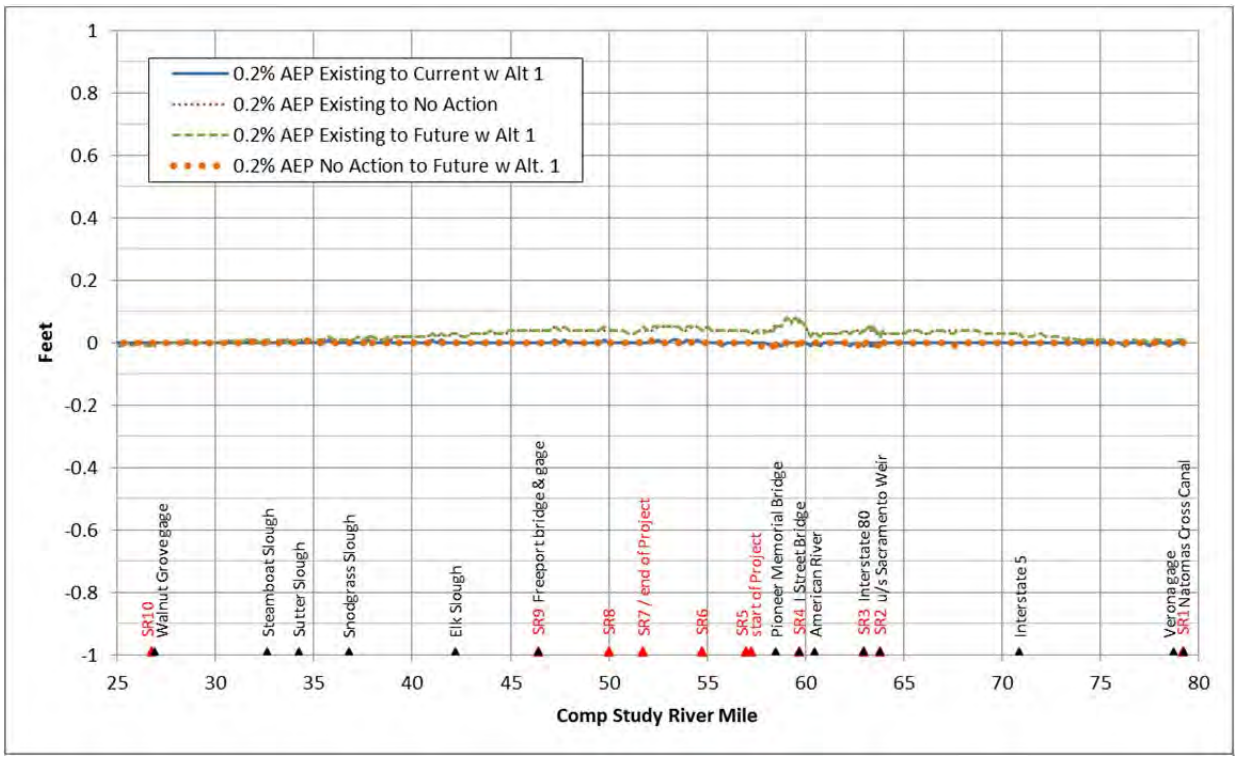


Figure 32. Maximum Water Surface Elevation Impacts; Sacramento River; Alternative 1; 0.2% AEP

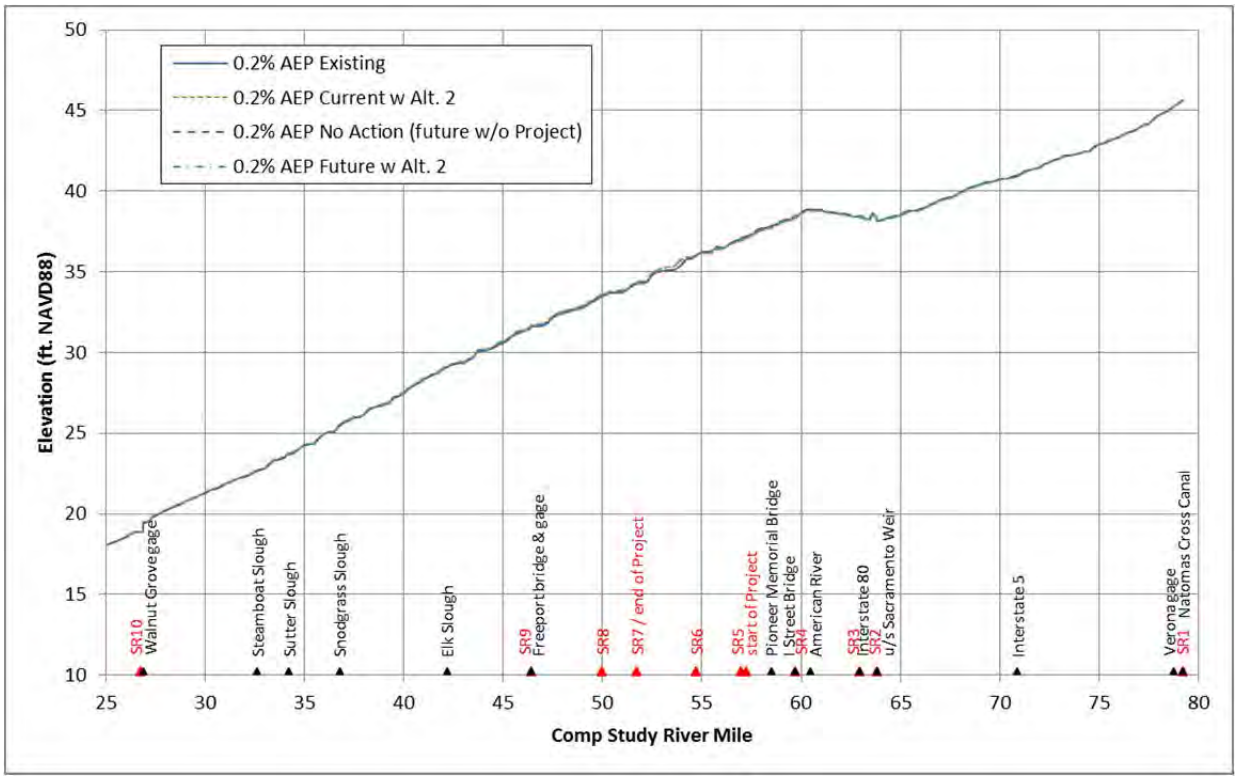


Figure 33. Maximum Water Surface Elevations; Sacramento River; Alternative 2; 0.2% AEP

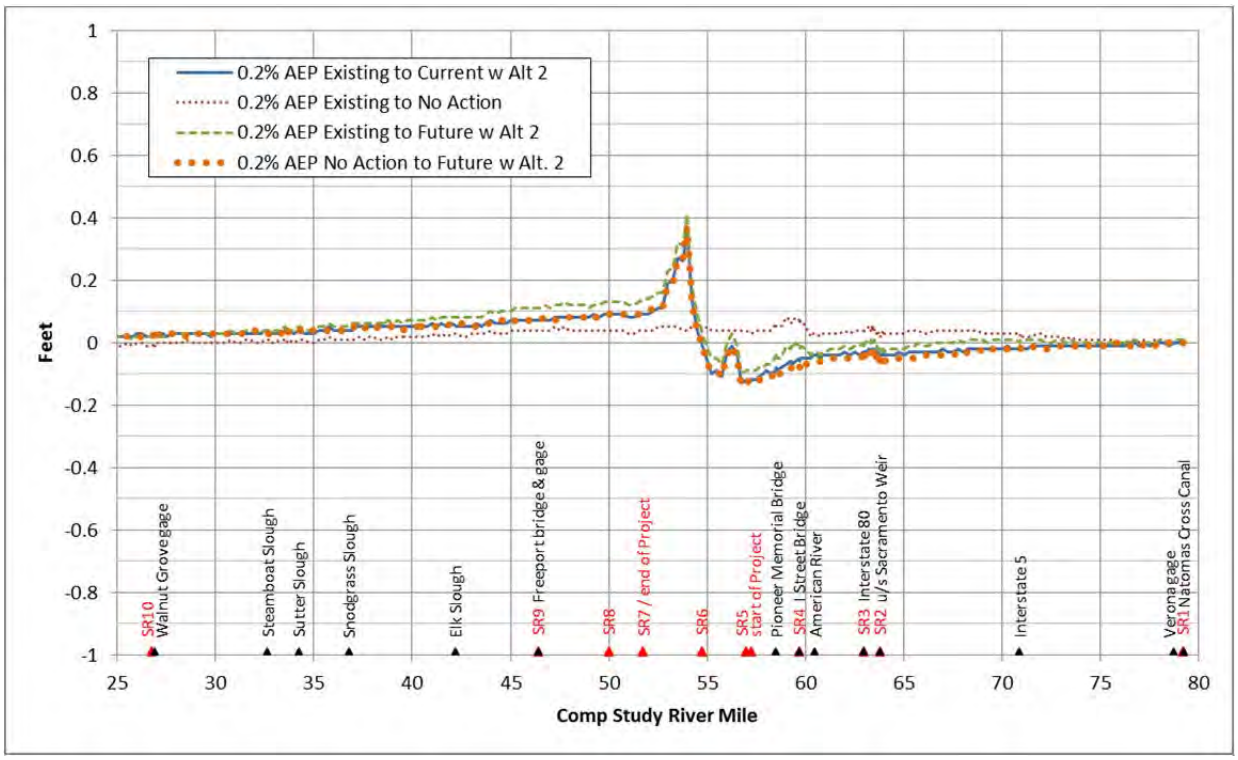


Figure 34. Maximum Water Surface Elevation Impacts; Sacramento River; Alternative 2; 0.2% AEP

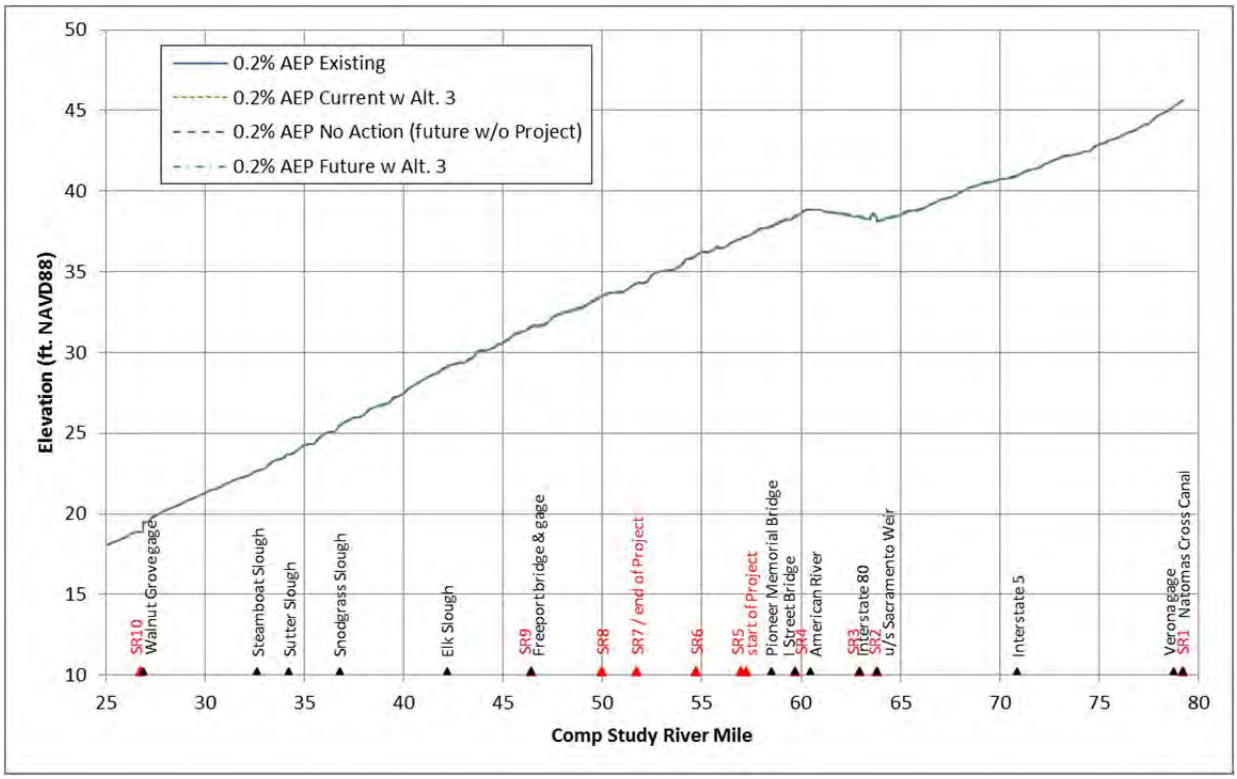


Figure 35. Maximum Water Surface Elevations; Sacramento River; Alternative 3; 0.2% AEP

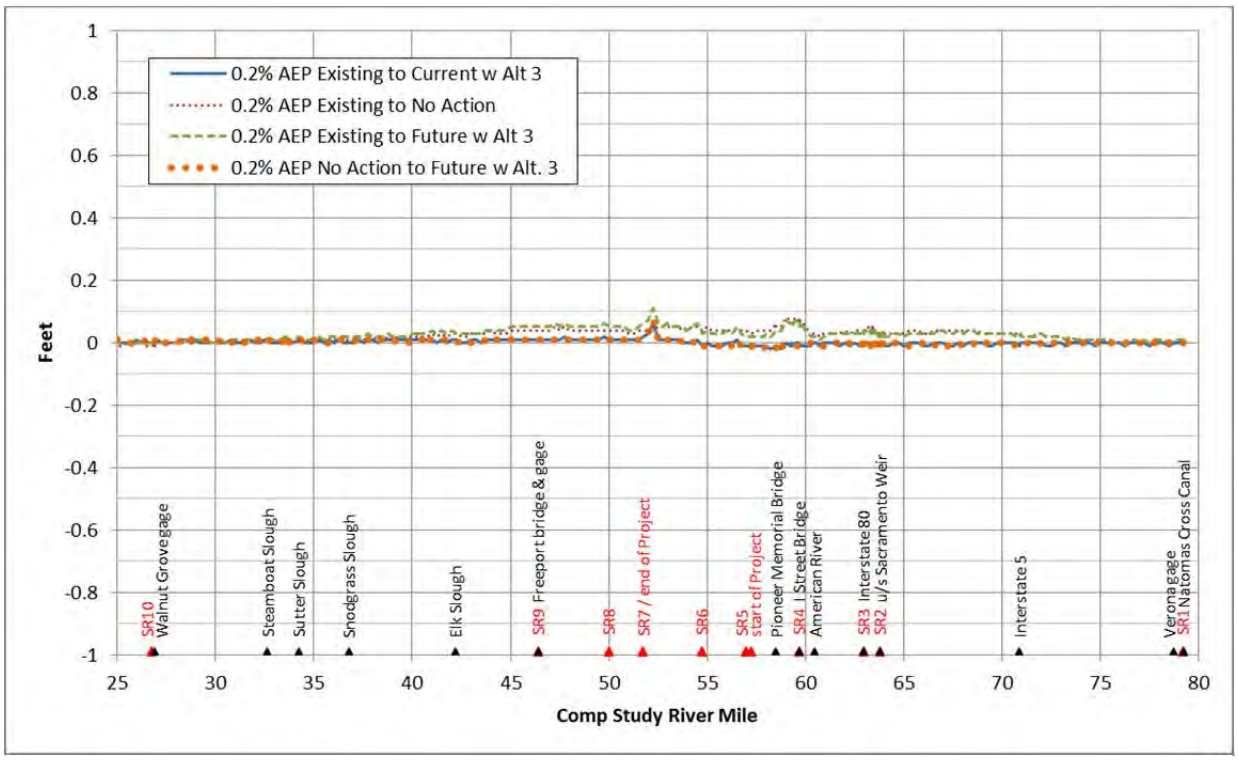


Figure 36. Maximum Water Surface Elevation Impacts; Sacramento River; Alternative 3; 0.2% AEP

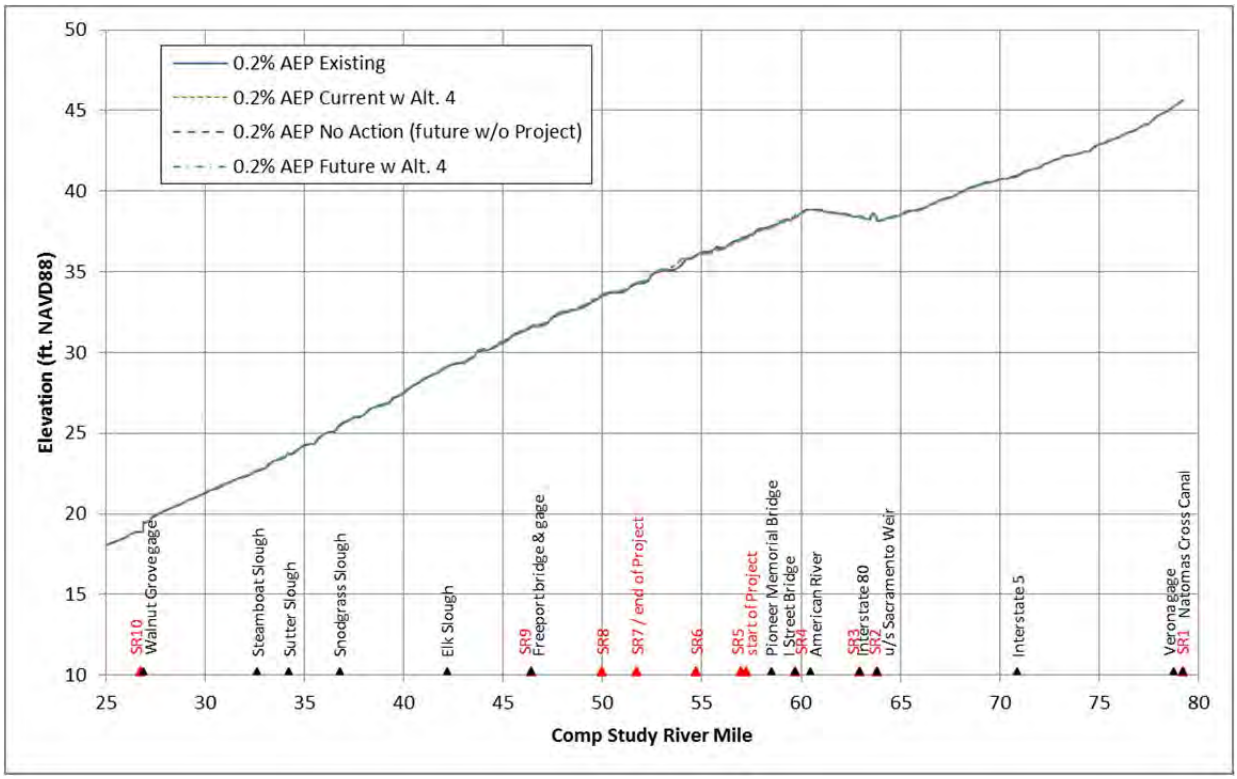


Figure 37. Maximum Water Surface Elevations; Sacramento River; Alternative 4; 0.2% AEP

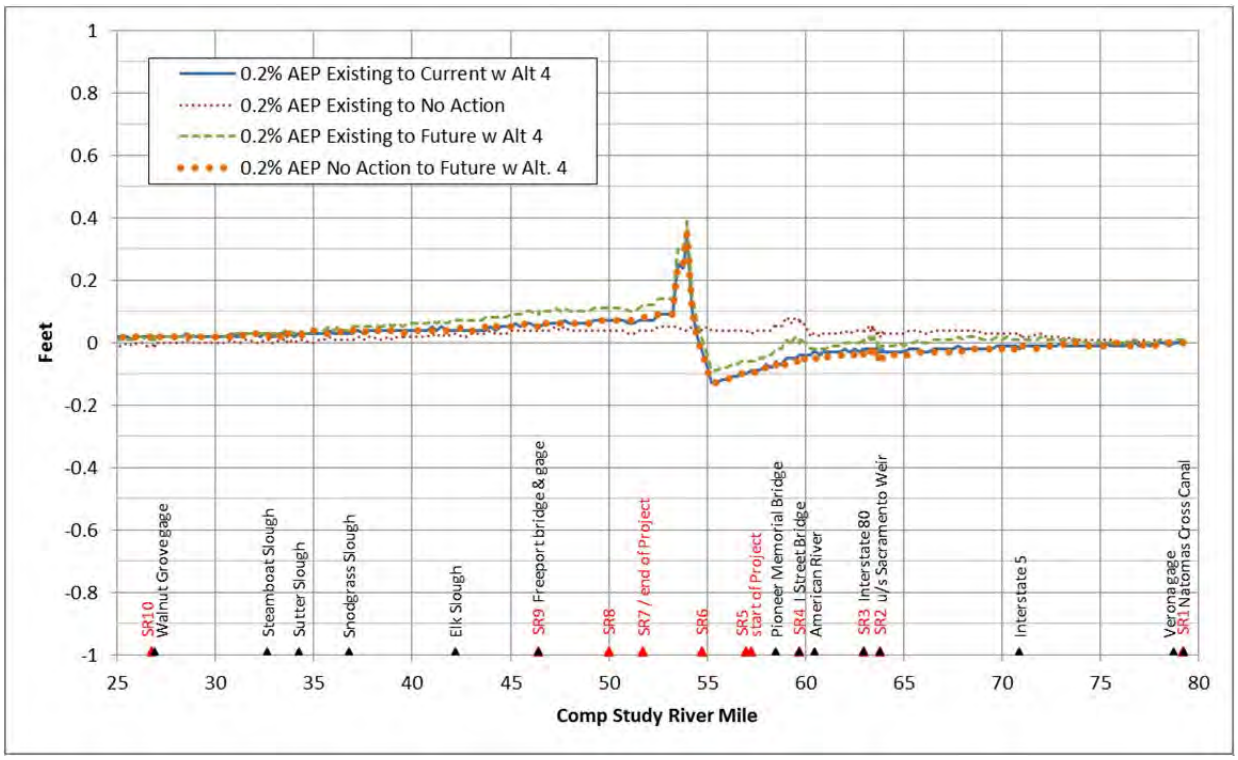


Figure 38. Maximum Water Surface Elevation Impacts; Sacramento River; Alternative 4; 0.2% AEP

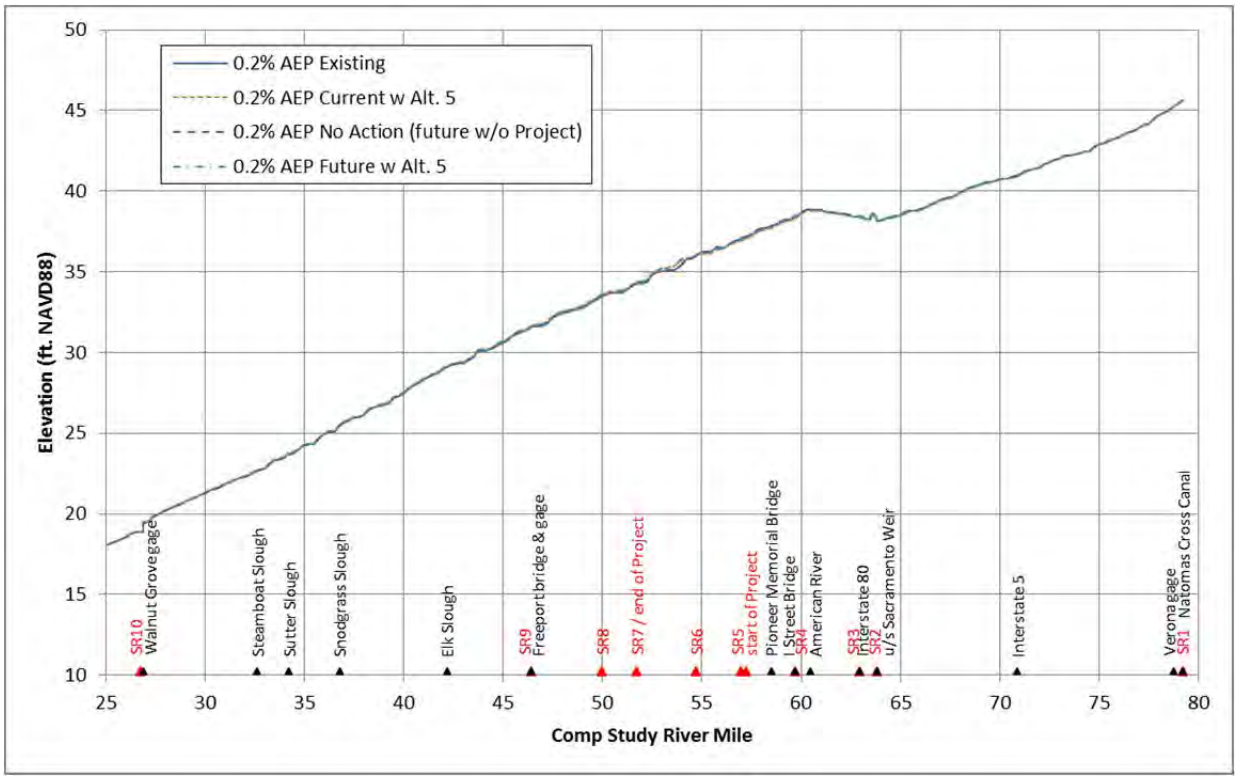


Figure 39. Maximum Water Surface Elevations; Sacramento River; Alternative 5; 0.2% AEP

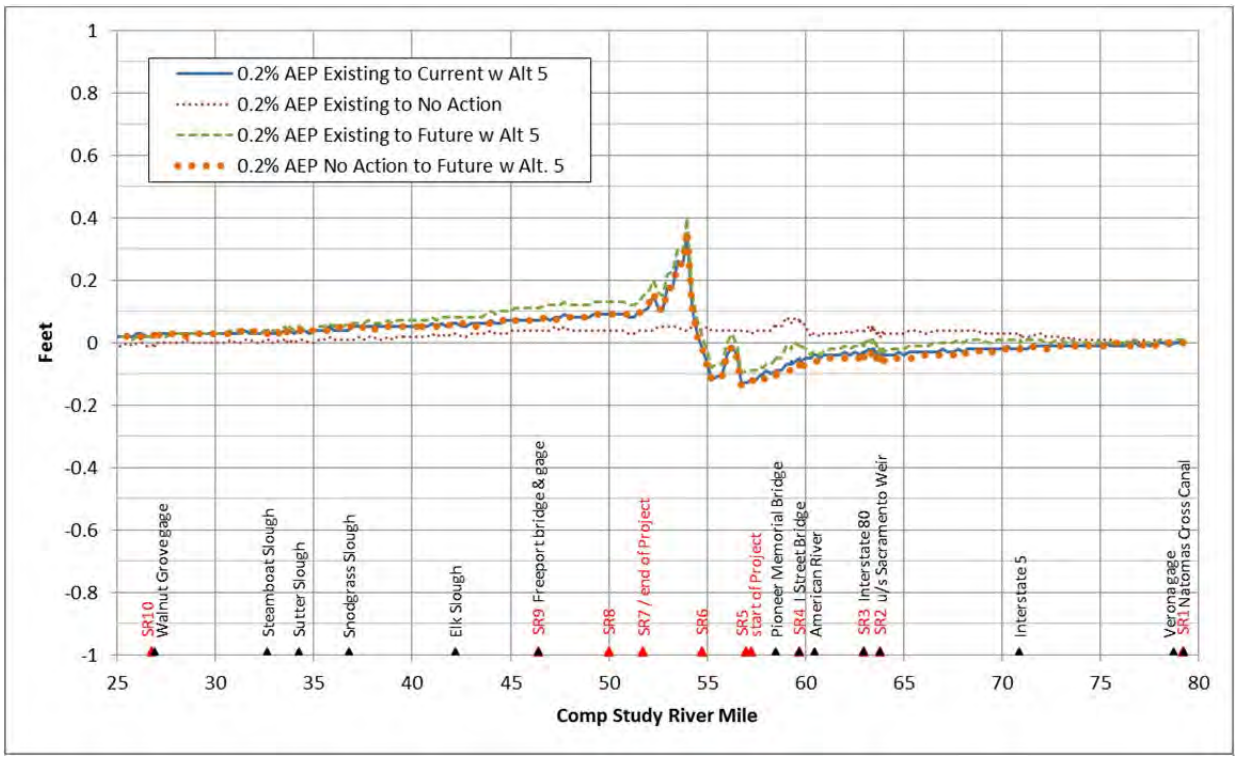


Figure 40. Maximum Water Surface Elevation Impacts; Sacramento River; Alternative 5; 0.2% AEP

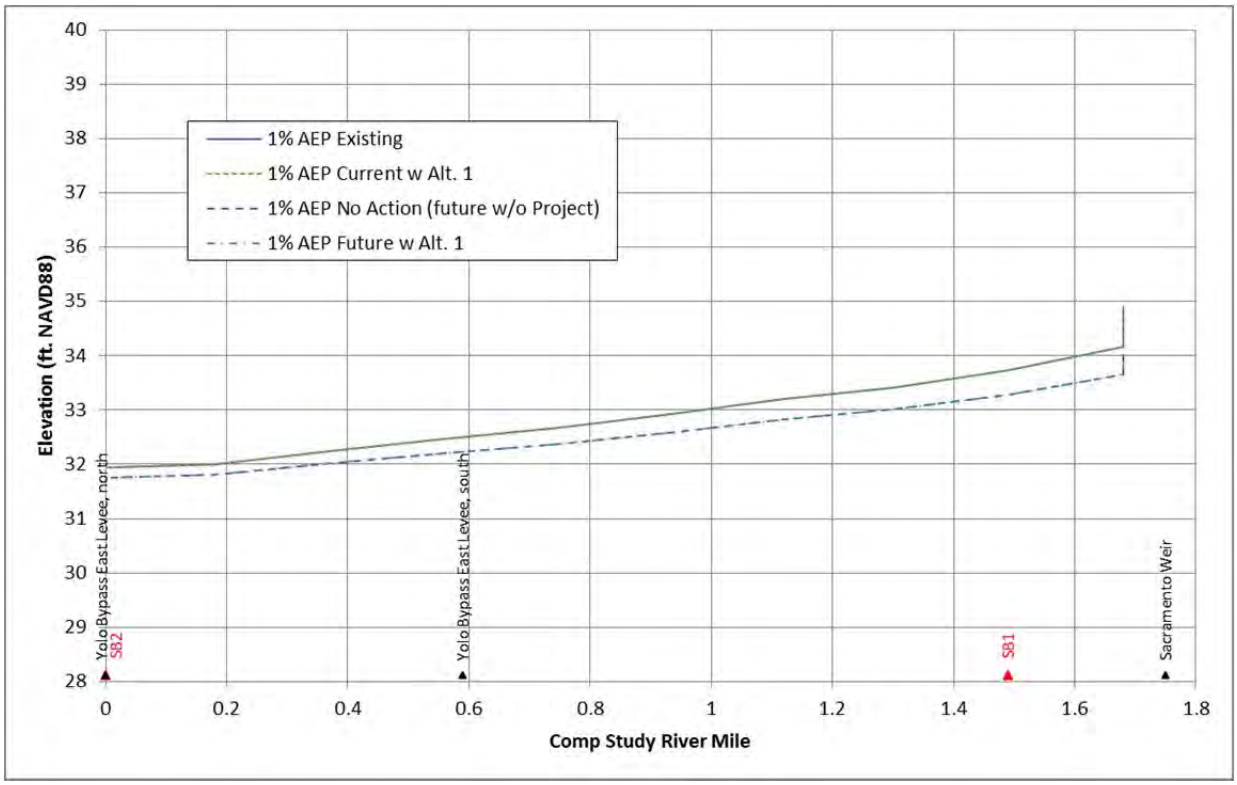


Figure 41. Maximum Water Surface Elevations; Sacramento Bypass; Alternative 1; 1% AEP

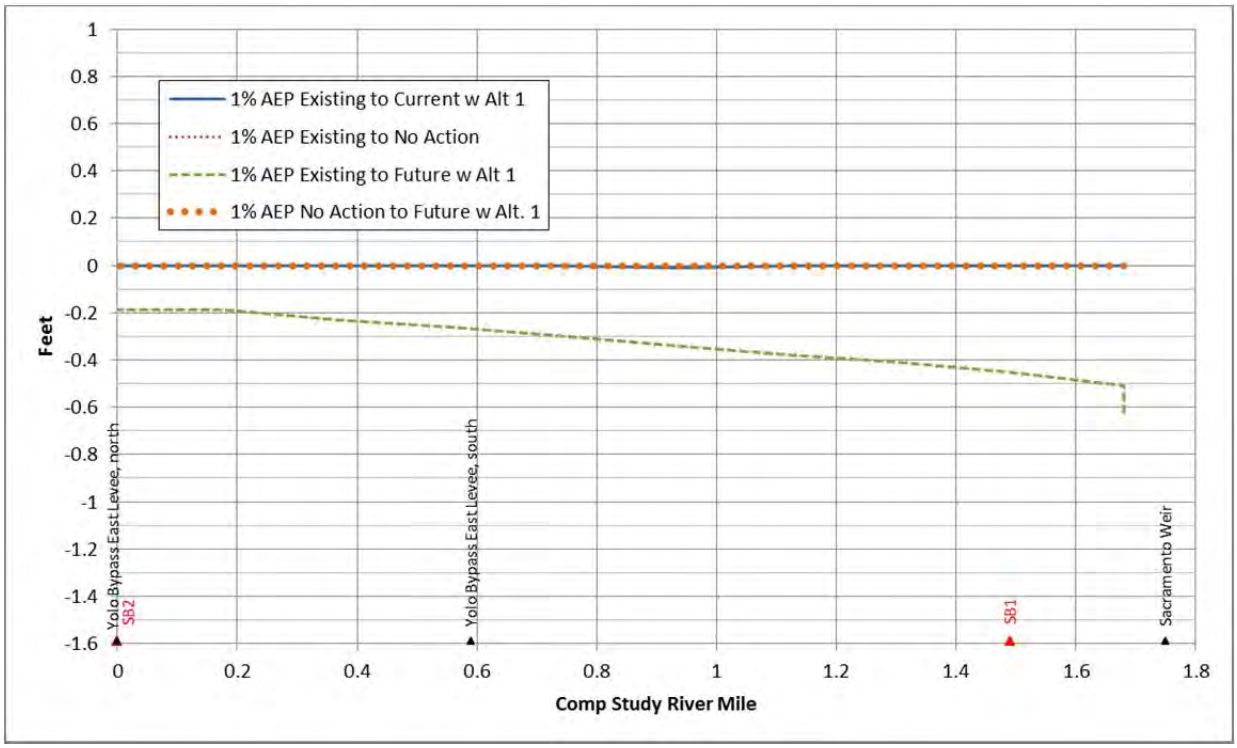


Figure 42. Maximum Water Surface Elevation Impacts; Sacramento Bypass; Alternative 1; 1% AEP

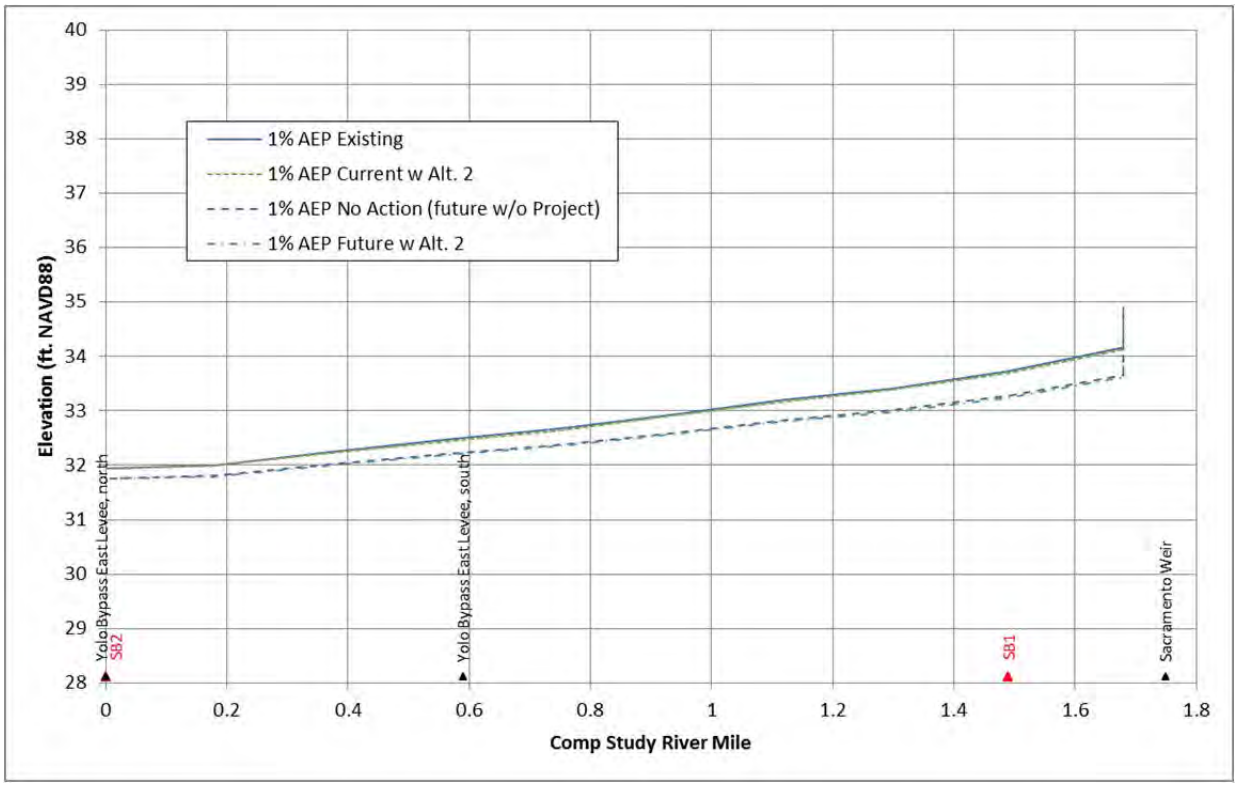


Figure 43. Maximum Water Surface Elevations; Sacramento Bypass; Alternative 2; 1% AEP

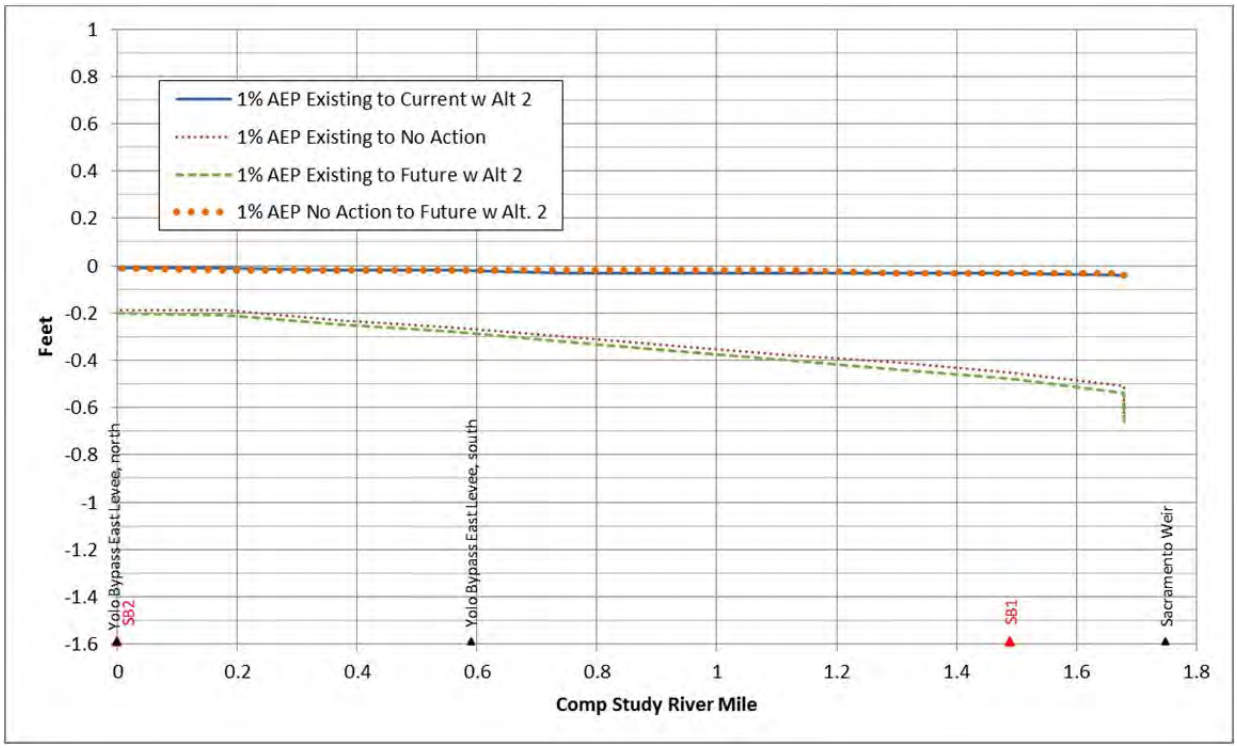


Figure 44. Maximum Water Surface Elevation Impacts; Sacramento Bypass; Alternative 2; 1% AEP

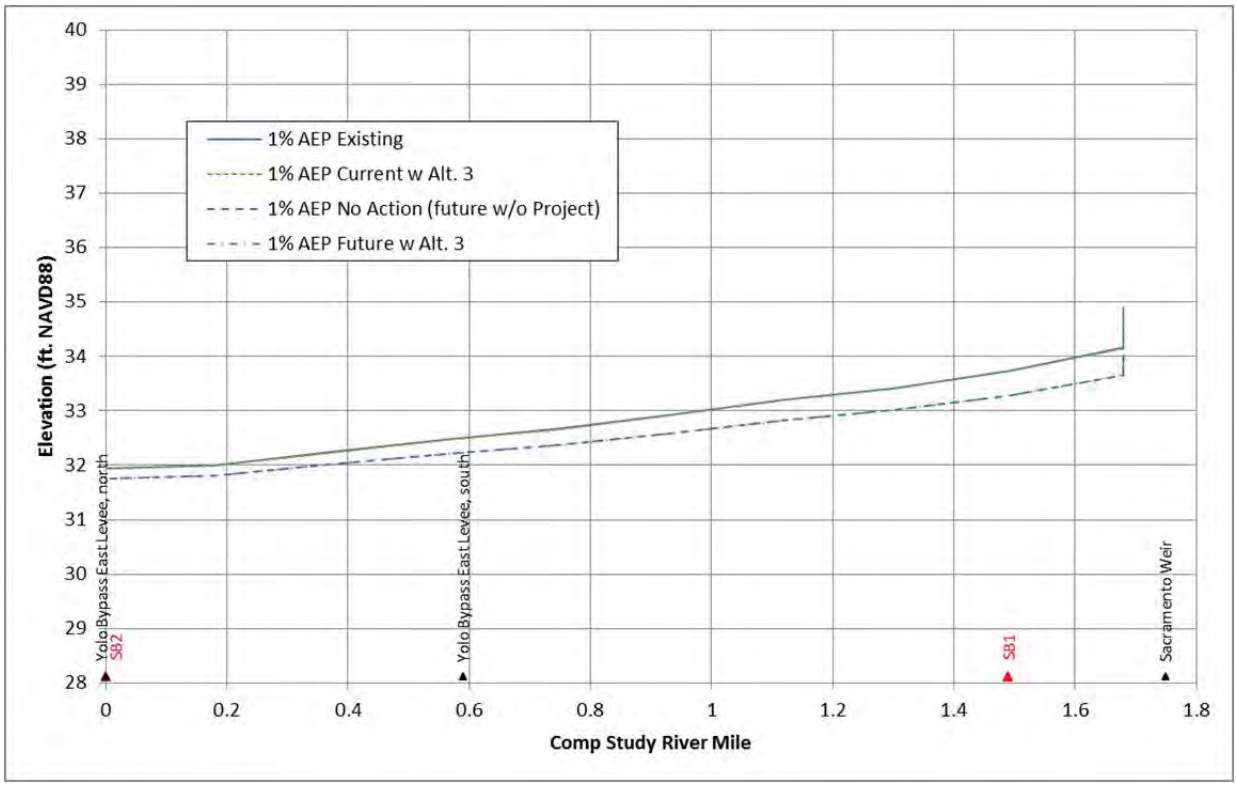


Figure 45. Maximum Water Surface Elevations; Sacramento Bypass; Alternative 3; 1% AEP

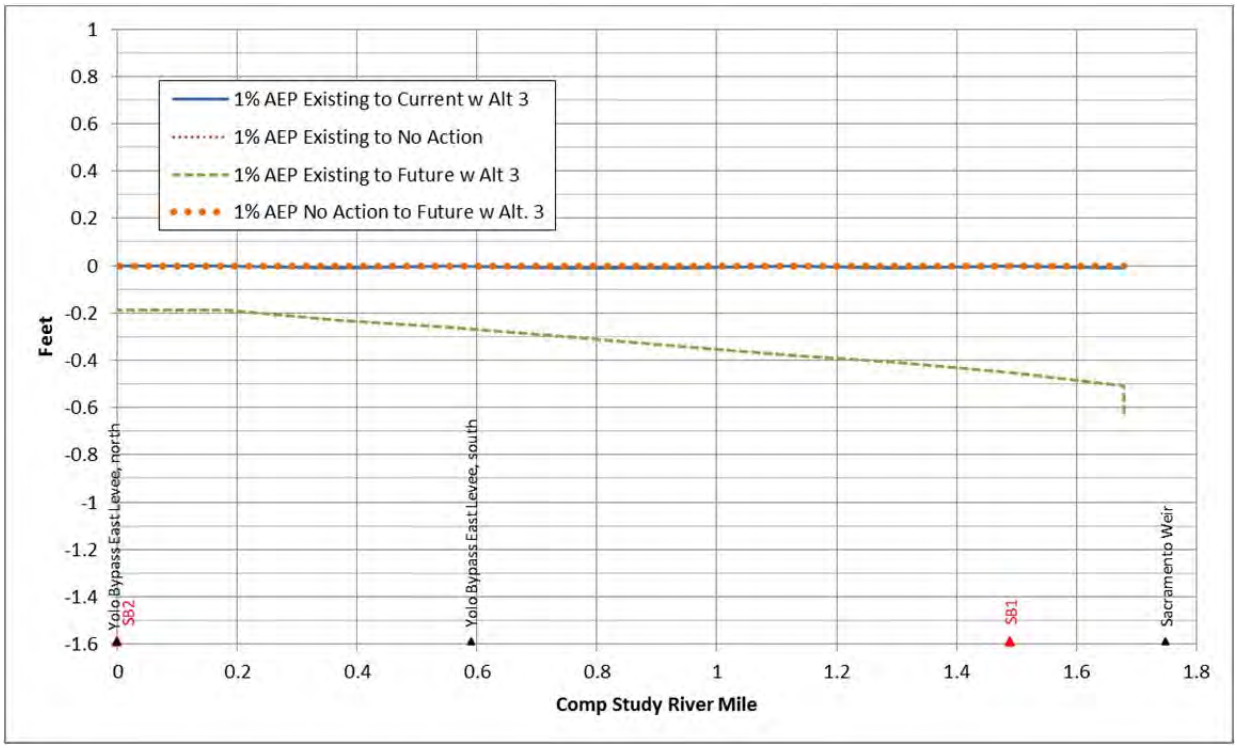


Figure 46. Maximum Water Surface Elevation Impacts; Sacramento Bypass; Alternative 3; 1% AEP

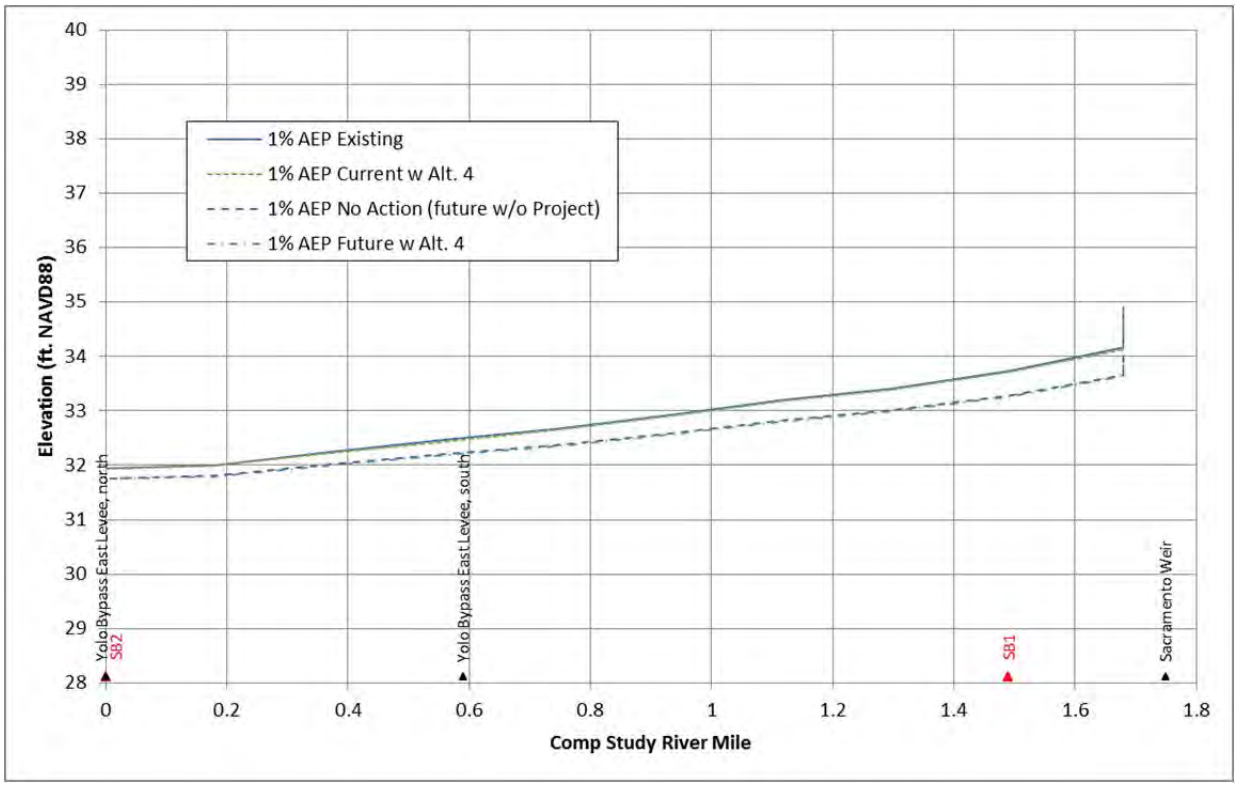


Figure 47. Maximum Water Surface Elevations; Sacramento Bypass; Alternative 4; 1% AEP

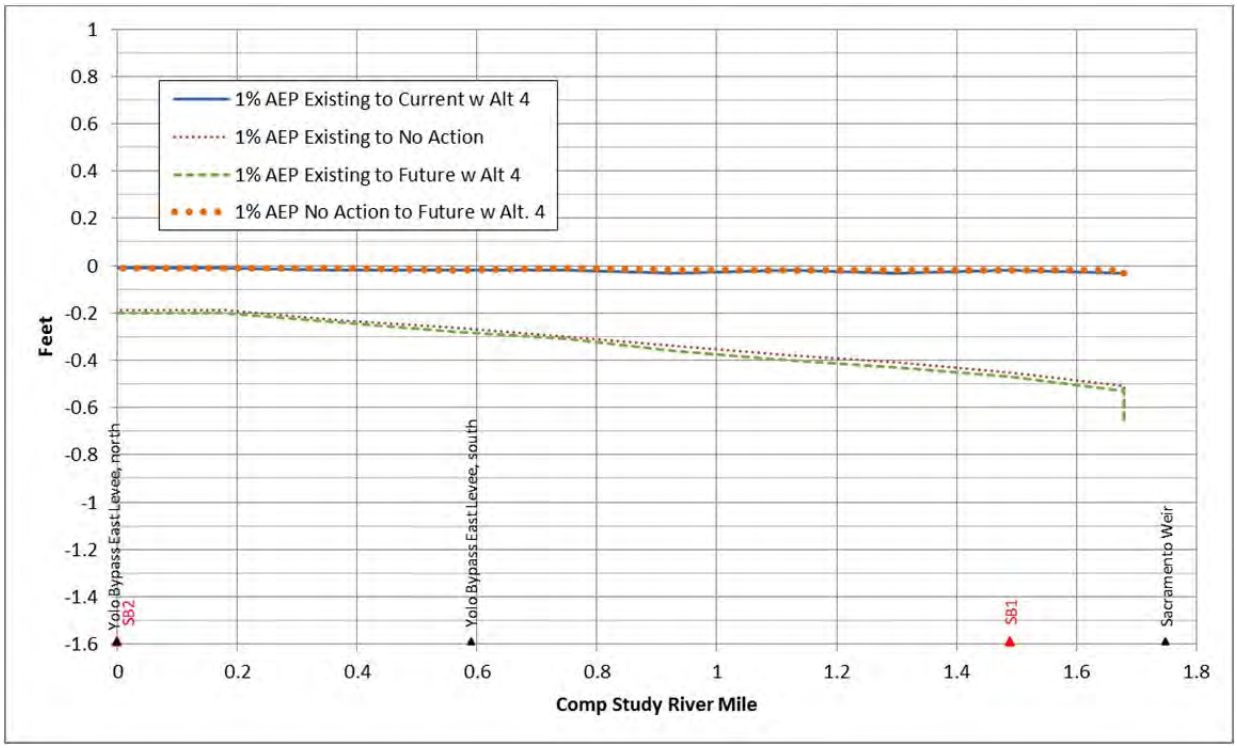


Figure 48. Maximum Water Surface Elevation Impacts; Sacramento Bypass; Alternative 4; 1% AEP

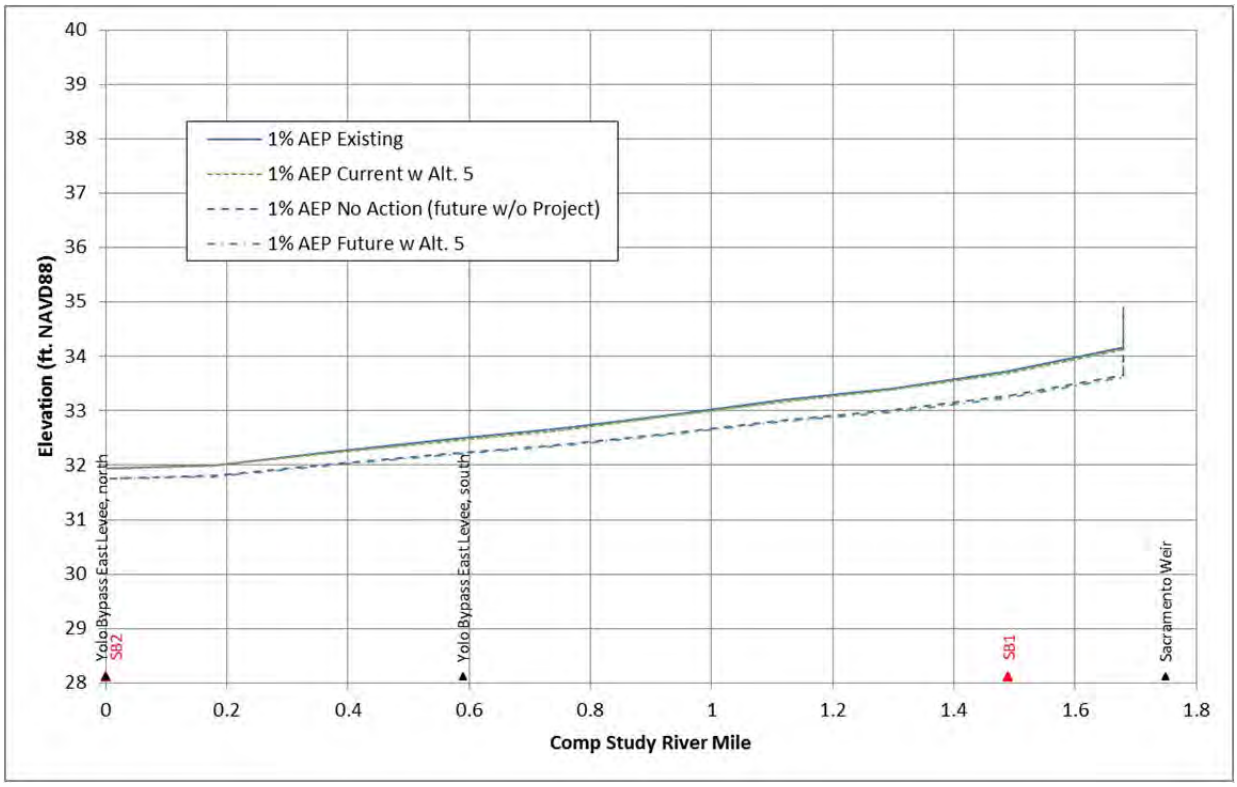


Figure 49. Maximum Water Surface Elevations; Sacramento Bypass; Alternative 5; 1% AEP

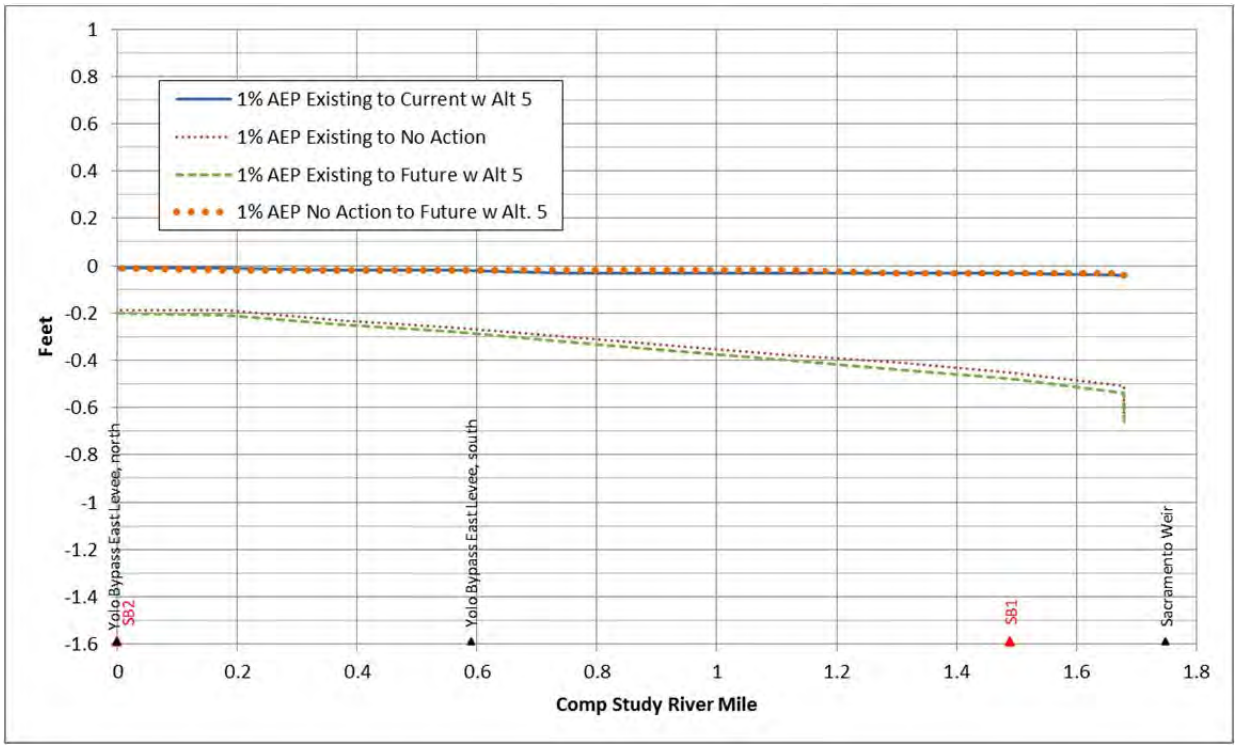


Figure 50. Maximum Water Surface Elevation Impacts; Sacramento Bypass; Alternative 5; 1% AEP

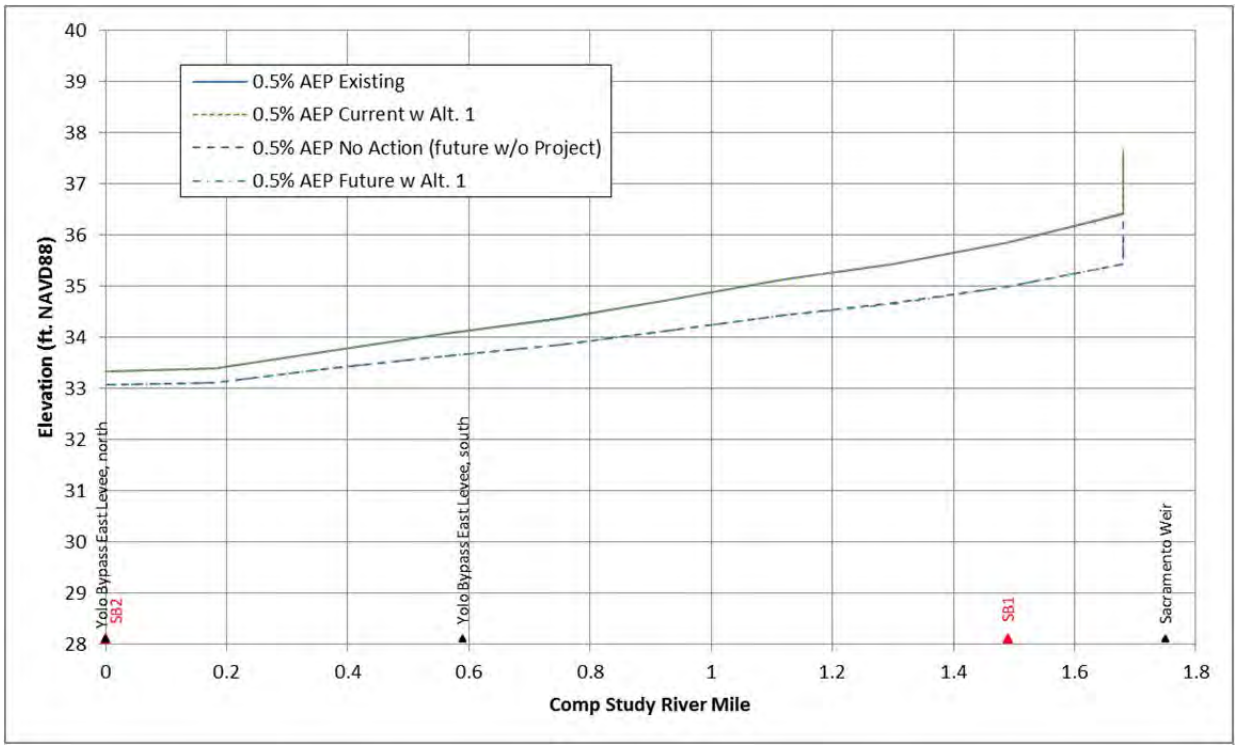


Figure 51. Maximum Water Surface Elevations; Sacramento Bypass; Alternative 1; 0.5% AEP

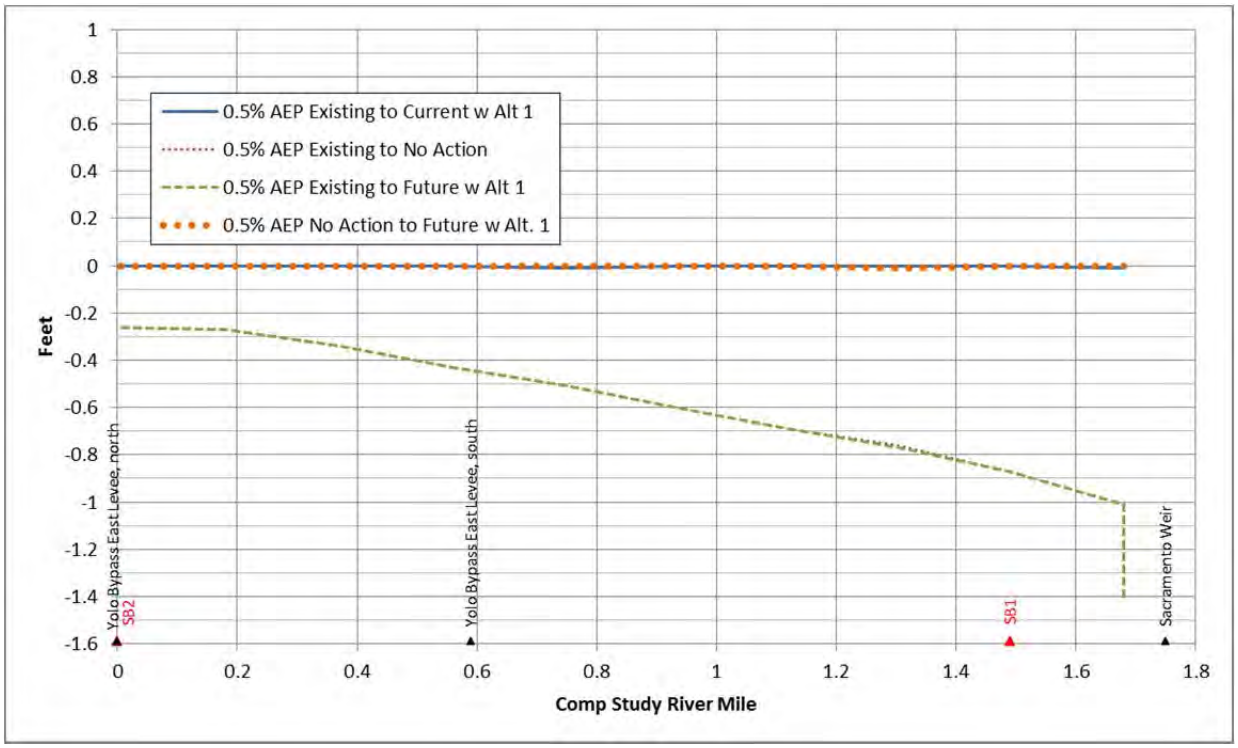


Figure 52. Maximum Water Surface Elevation Impacts; Sacramento Bypass; Alternative 1; 0.5% AEP

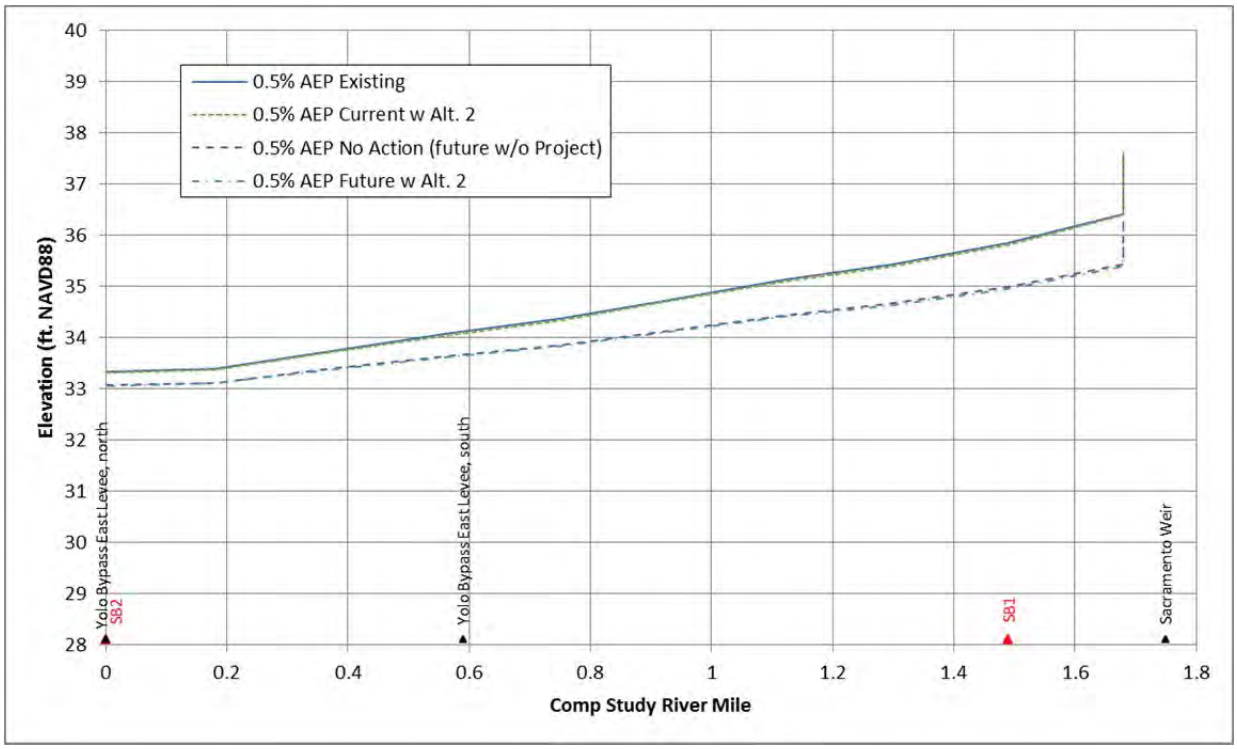


Figure 53. Maximum Water Surface Elevations; Sacramento Bypass; Alternative 2; 0.5% AEP

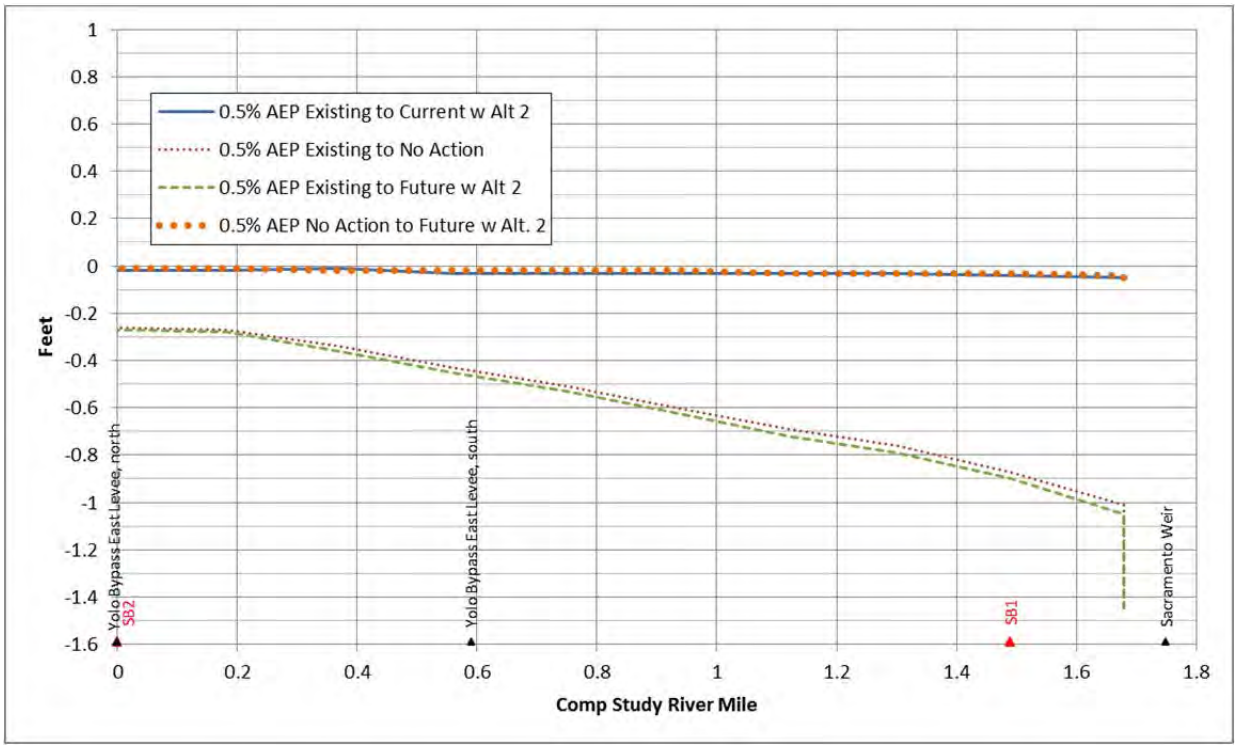


Figure 54. Maximum Water Surface Elevation Impacts; Sacramento Bypass; Alternative 2; 0.5% AEP

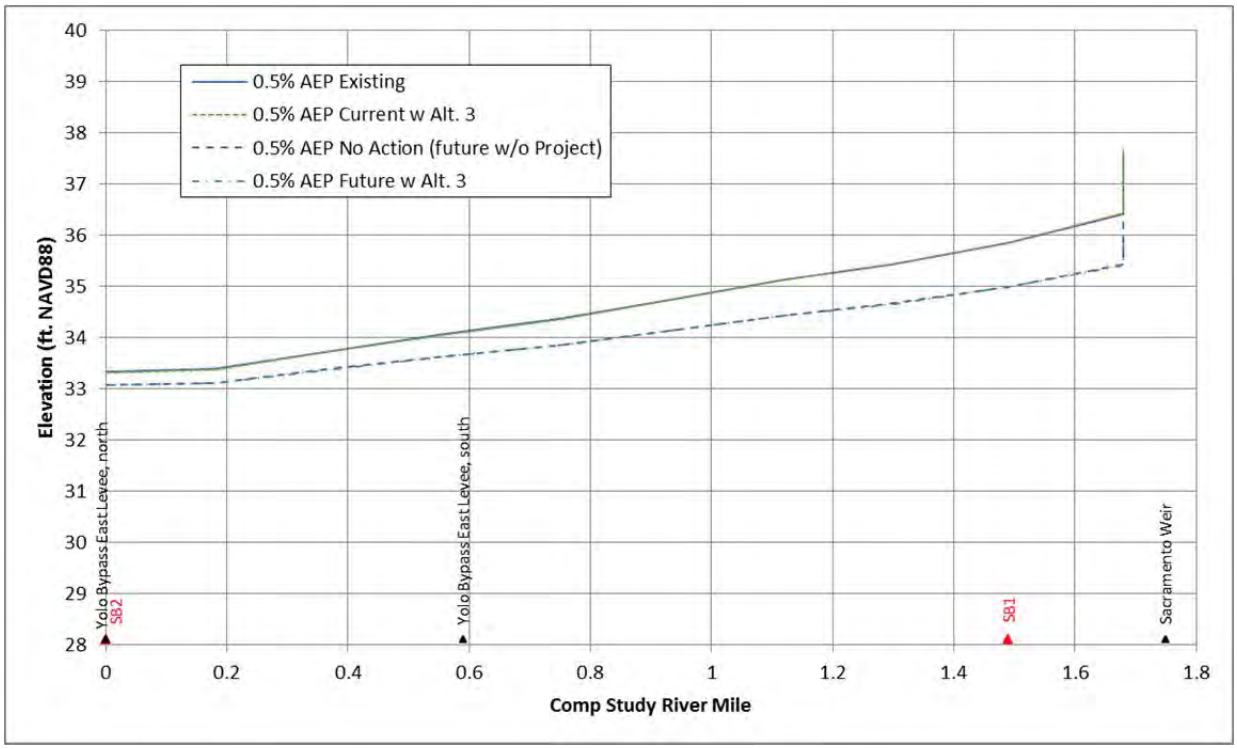


Figure 55. Maximum Water Surface Elevations; Sacramento Bypass; Alternative 3; 0.5% AEP

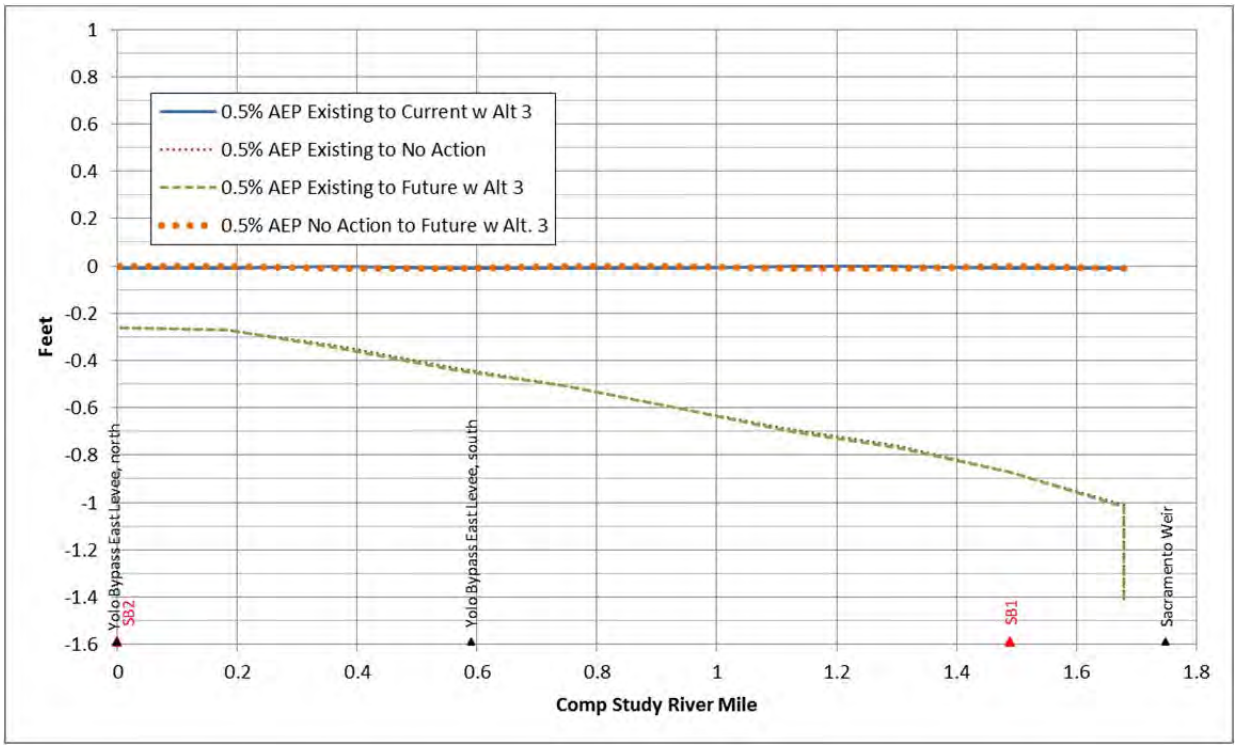


Figure 56. Maximum Water Surface Elevation Impacts; Sacramento Bypass; Alternative 3; 0.5% AEP

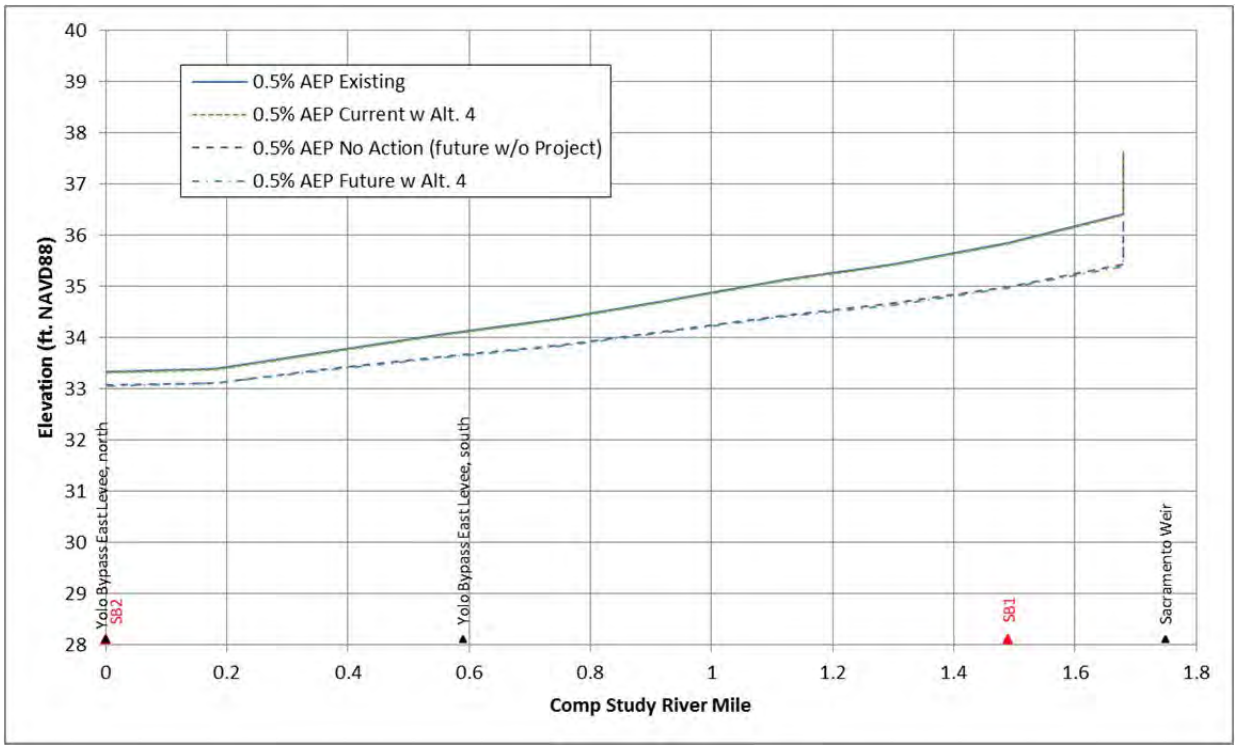


Figure 57. Maximum Water Surface Elevations; Sacramento Bypass; Alternative 4; 0.5% AEP

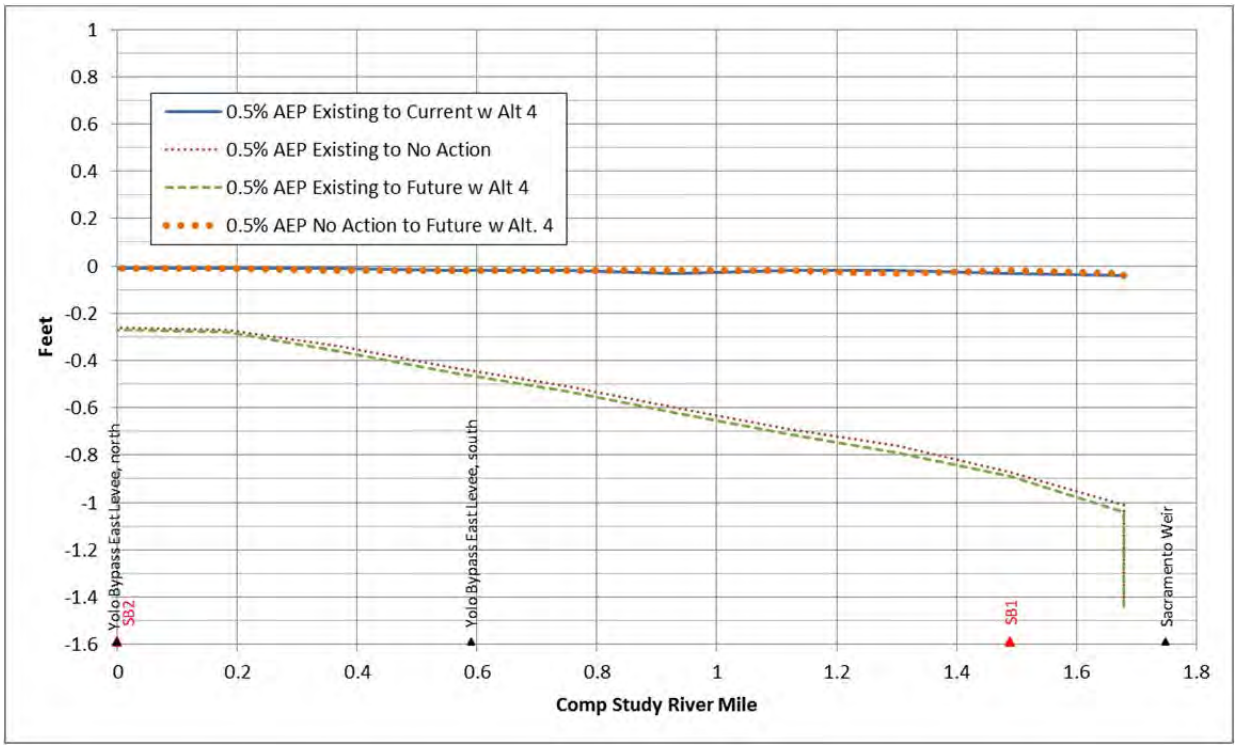


Figure 58. Maximum Water Surface Elevation Impacts; Sacramento Bypass; Alternative 4; 0.5% AEP

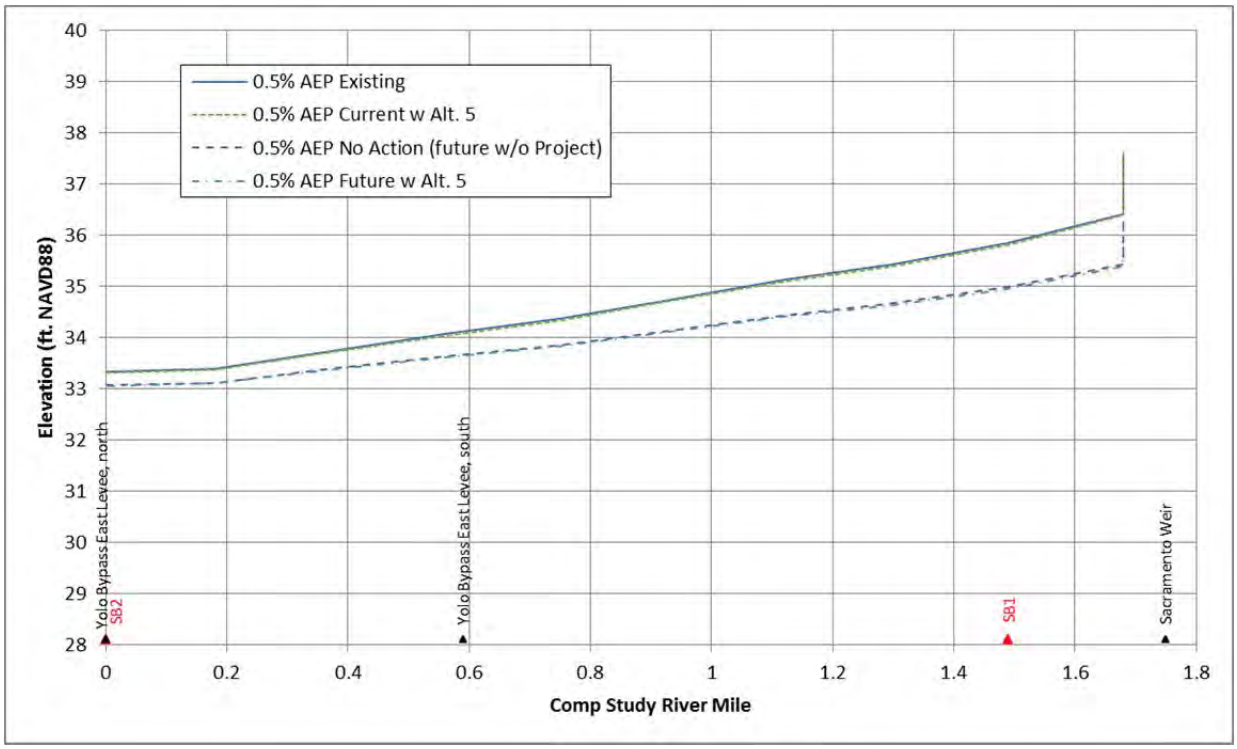


Figure 59. Maximum Water Surface Elevations; Sacramento Bypass; Alternative 5; 0.5% AEP

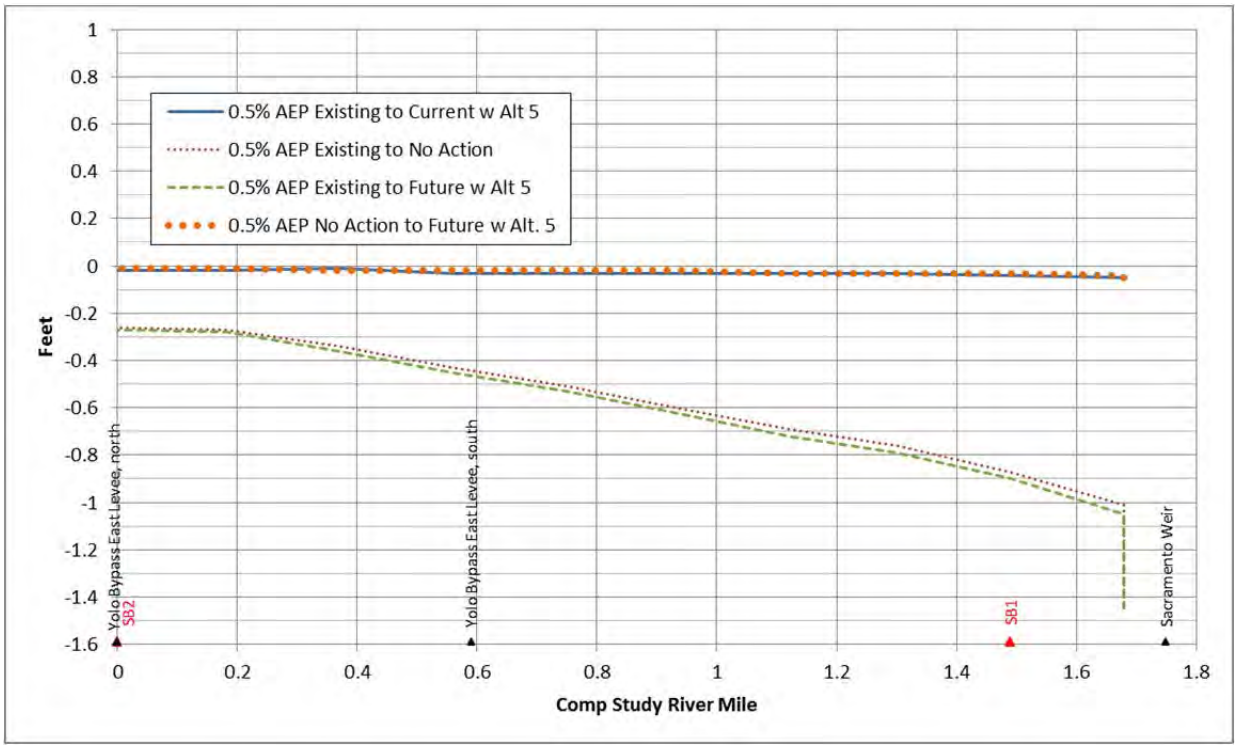


Figure 60. Maximum Water Surface Elevation Impacts; Sacramento Bypass; Alternative 5; 0.5% AEP

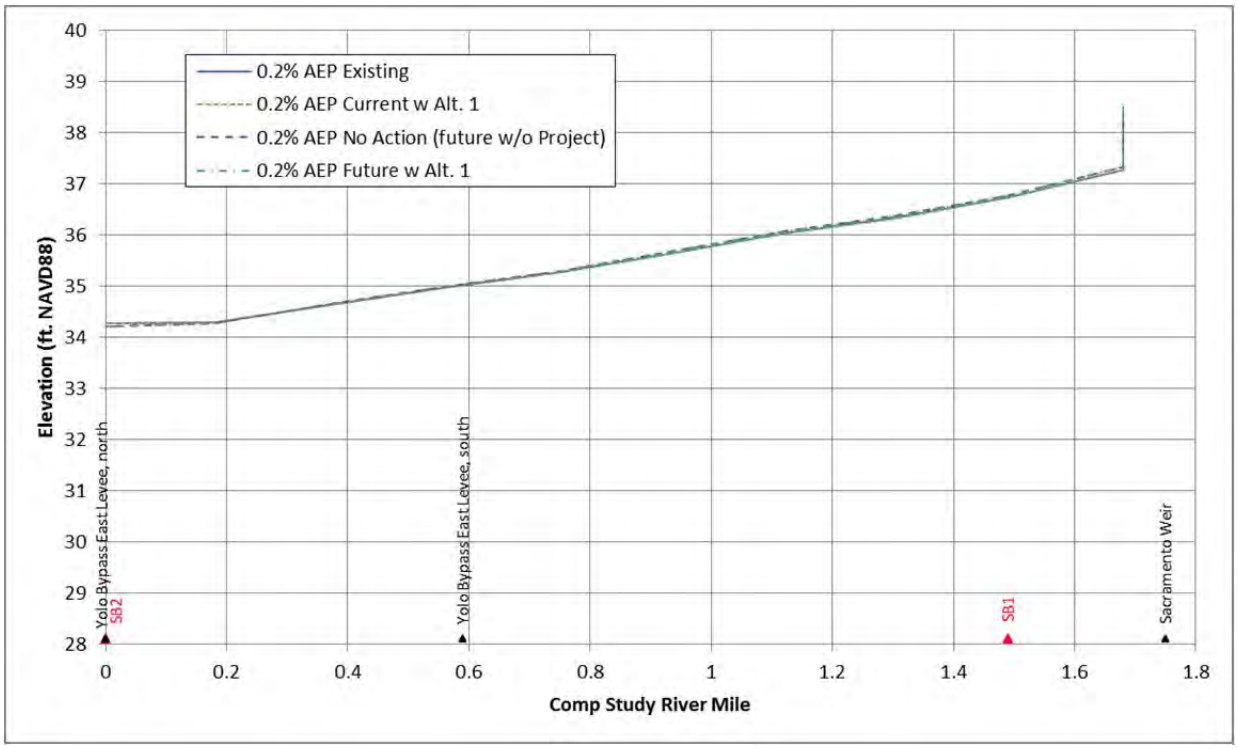


Figure 61. Maximum Water Surface Elevations; Sacramento Bypass; Alternative 1; 0.2% AEP

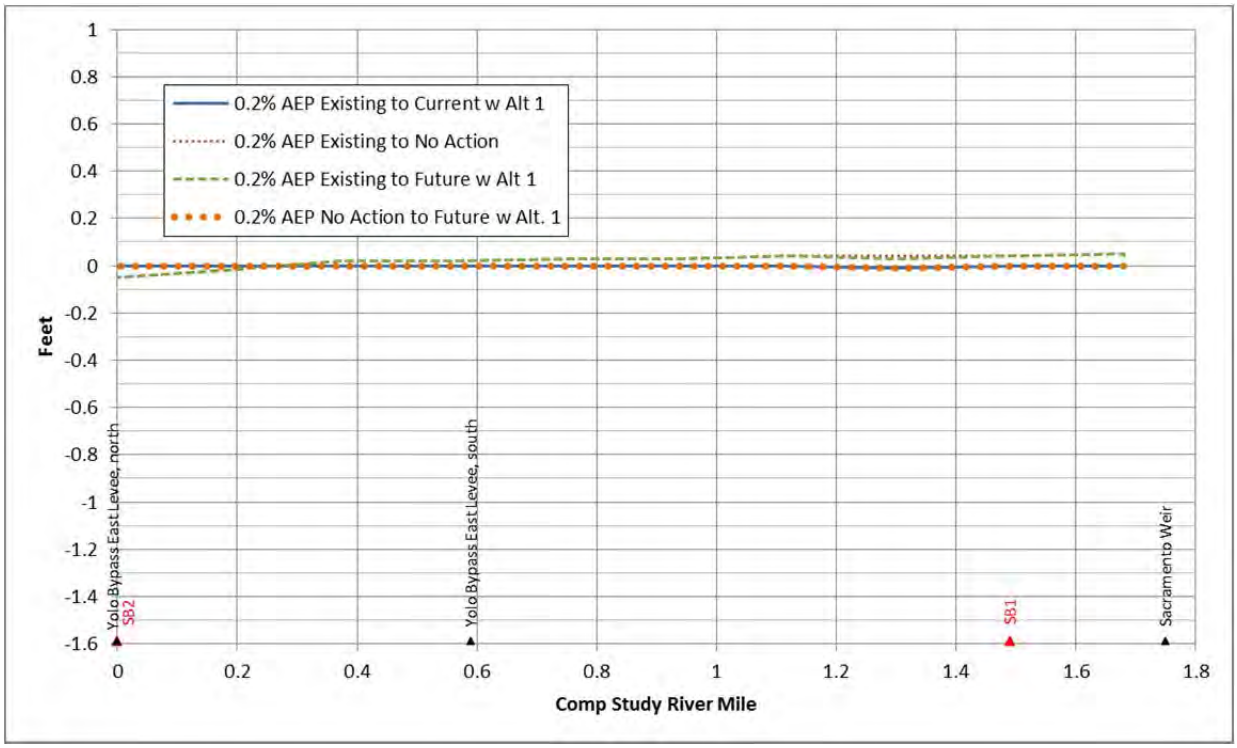


Figure 62. Maximum Water Surface Elevation Impacts; Sacramento Bypass; Alternative 1; 0.2% AEP

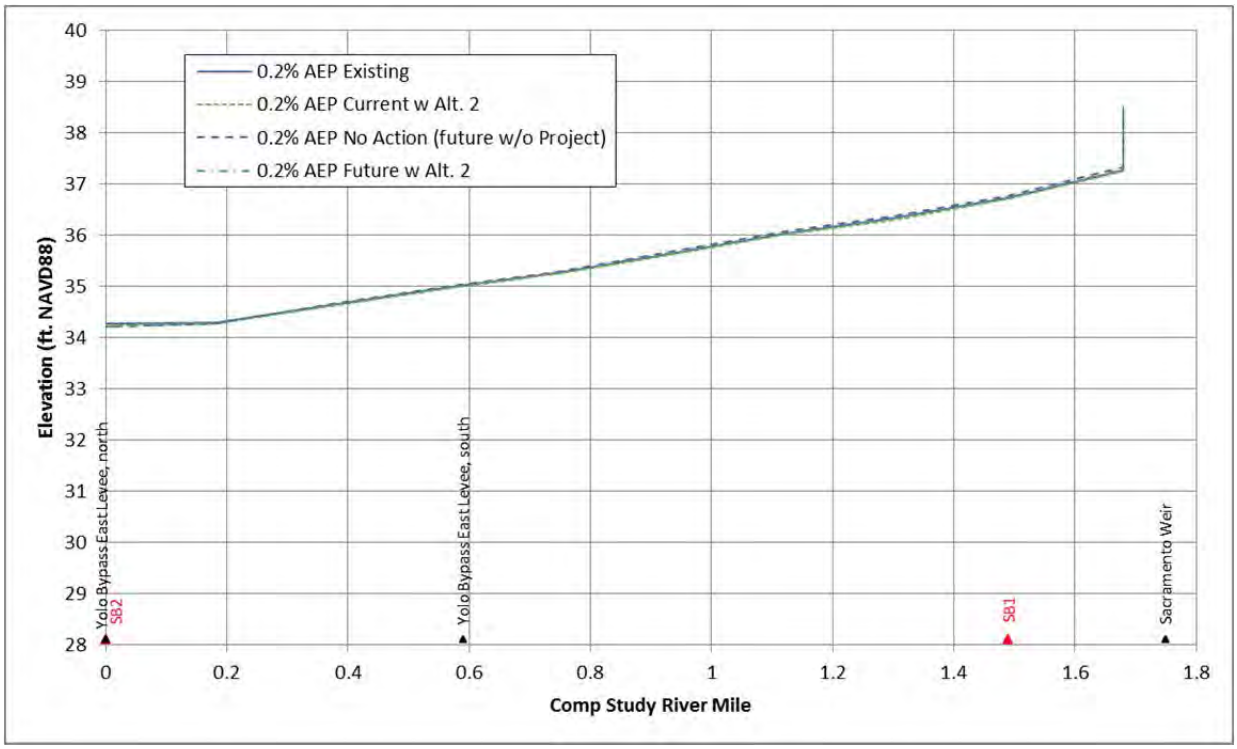


Figure 63. Maximum Water Surface Elevations; Sacramento Bypass; Alternative 2; 0.2% AEP

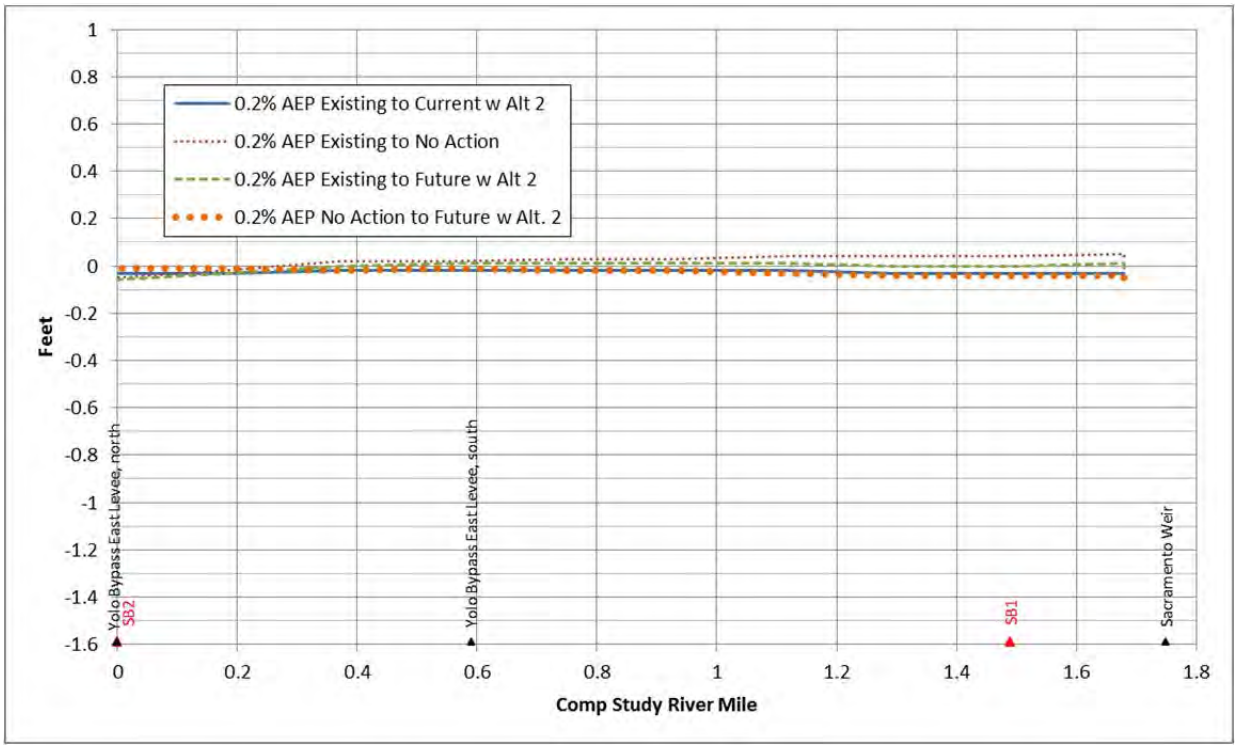


Figure 64. Maximum Water Surface Elevation Impacts; Sacramento Bypass; Alternative 2; 0.2% AEP

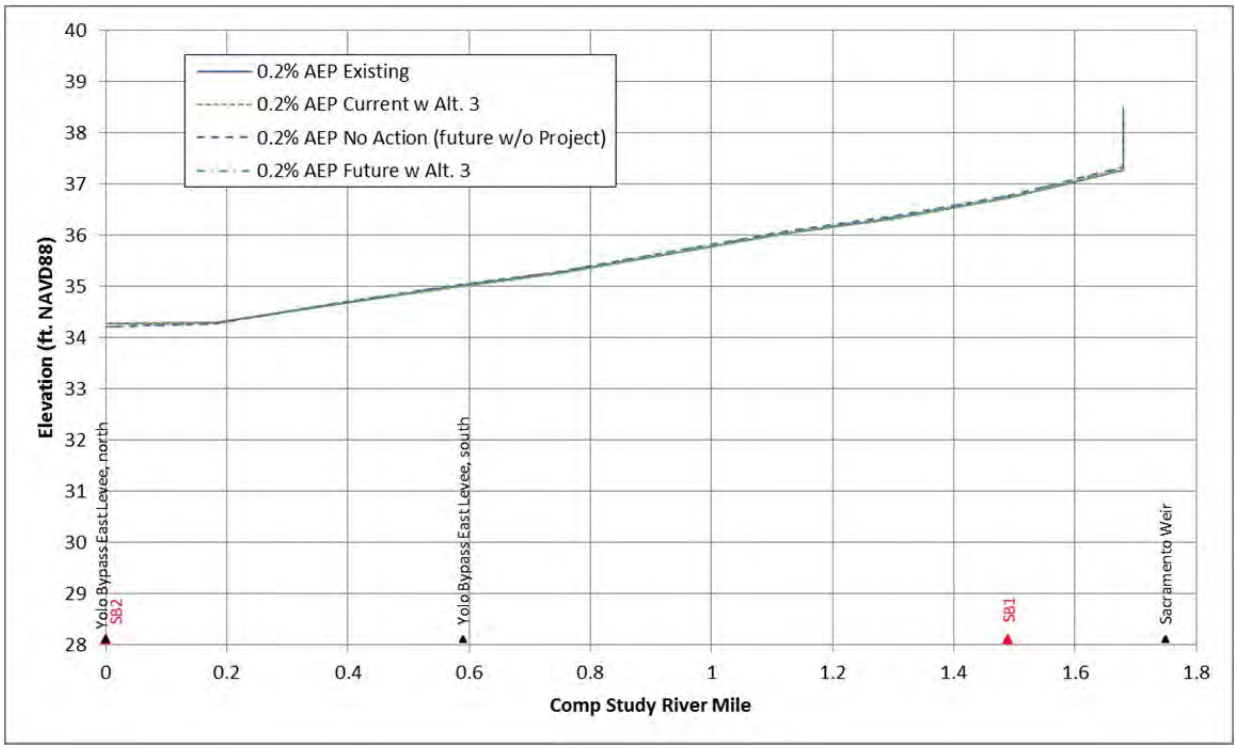


Figure 65. Maximum Water Surface Elevations; Sacramento Bypass; Alternative 3; 0.2% AEP

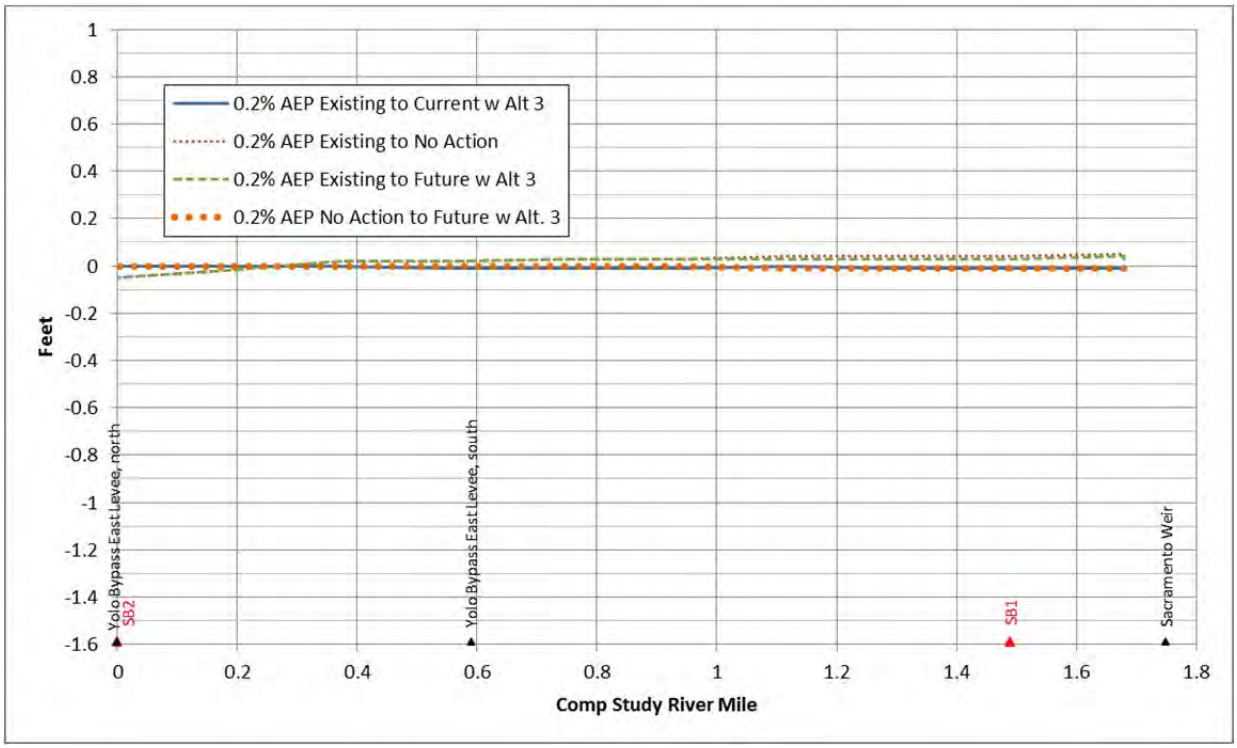


Figure 66. Maximum Water Surface Elevation Impacts; Sacramento Bypass; Alternative 3; 0.2% AEP

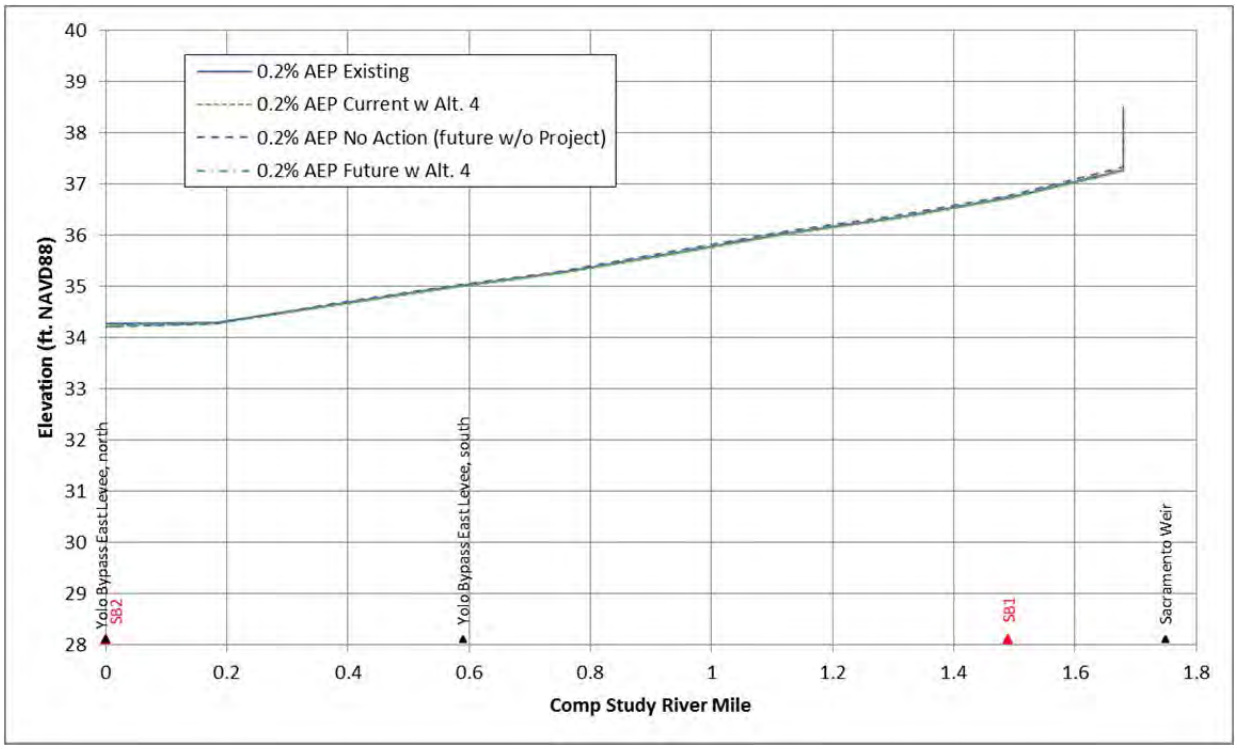


Figure 67. Maximum Water Surface Elevations; Sacramento Bypass; Alternative 4; 0.2% AEP

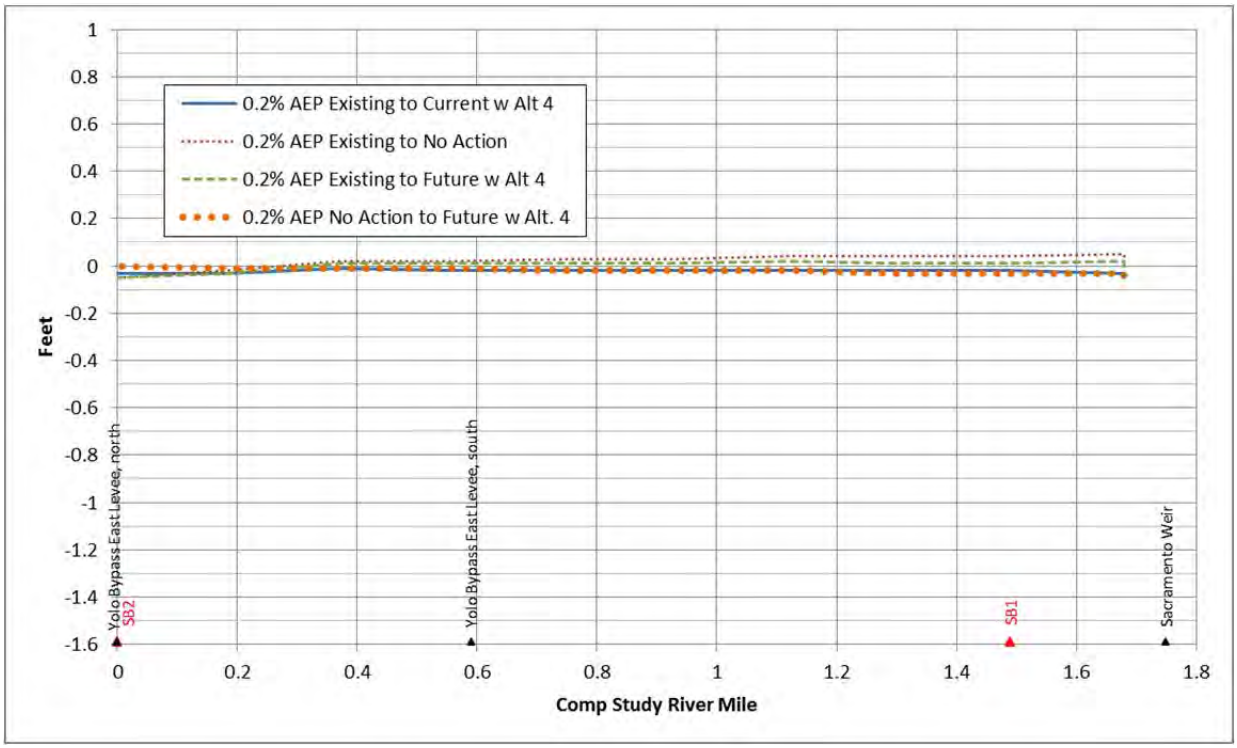


Figure 68. Maximum Water Surface Elevation Impacts; Sacramento Bypass; Alternative 4; 0.2% AEP

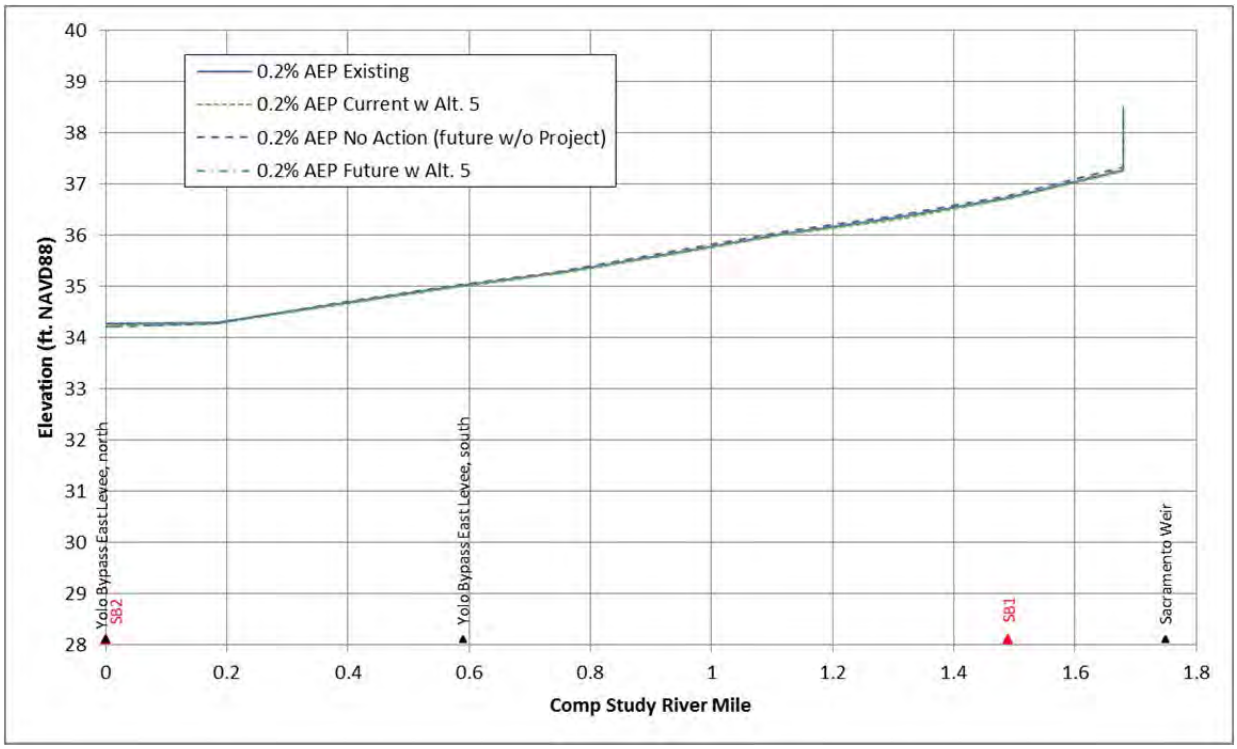


Figure 69. Maximum Water Surface Elevations; Sacramento Bypass; Alternative 5; 0.2% AEP

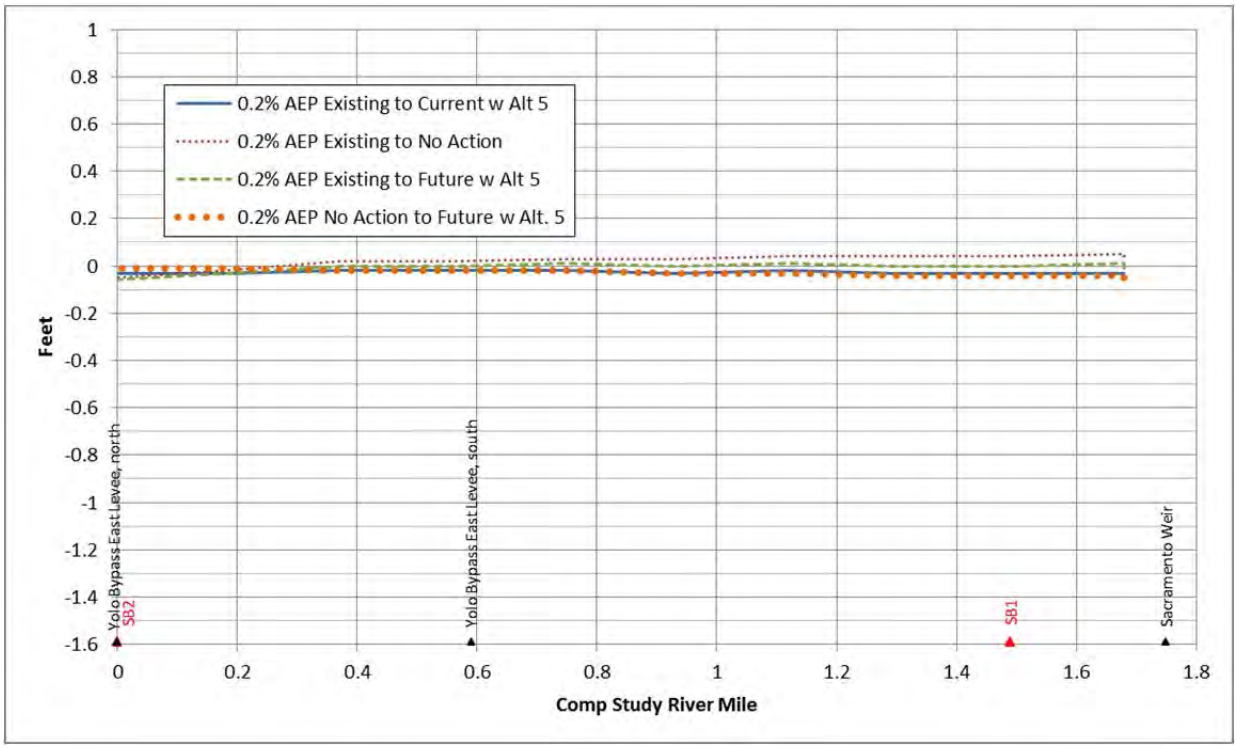


Figure 70. Maximum Water Surface Elevation Impacts; Sacramento Bypass; Alternative 5; 0.2% AEP

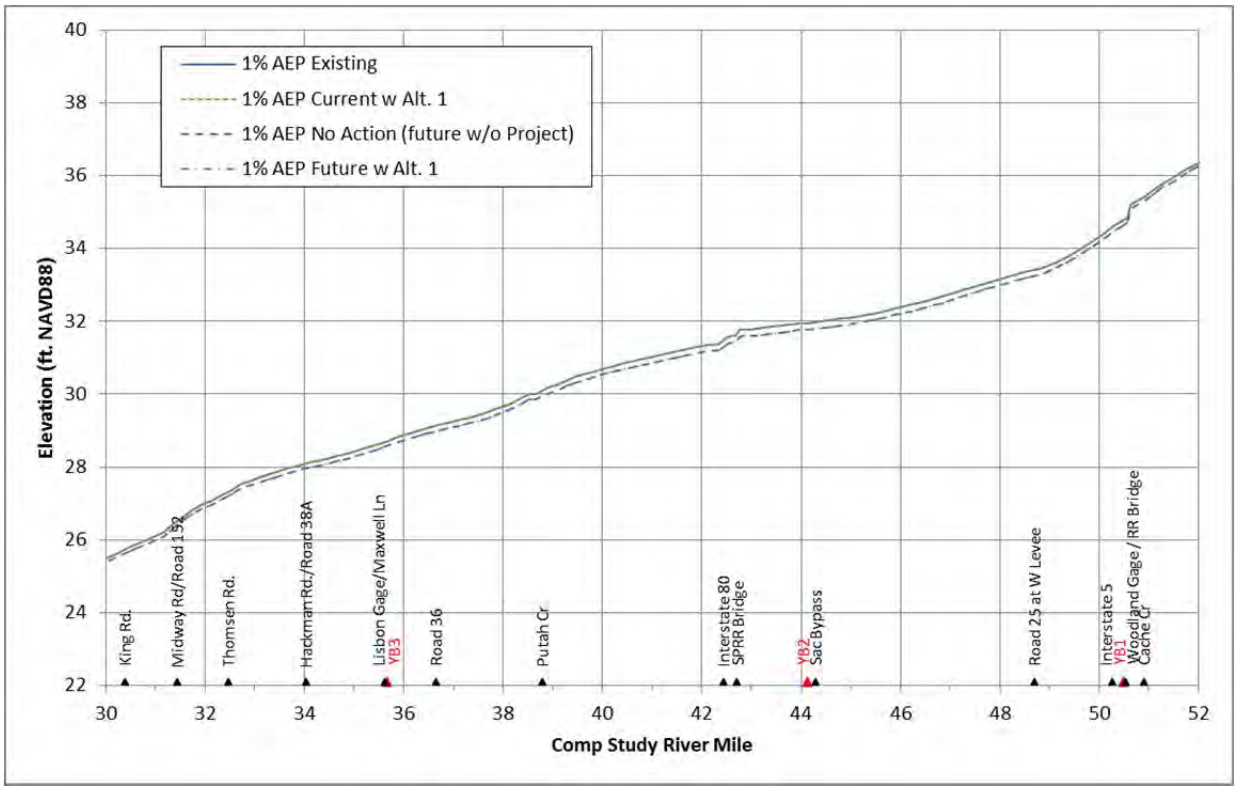


Figure 71. Maximum Water Surface Elevations; Yolo Bypass; Alternative 1; 1% AEP

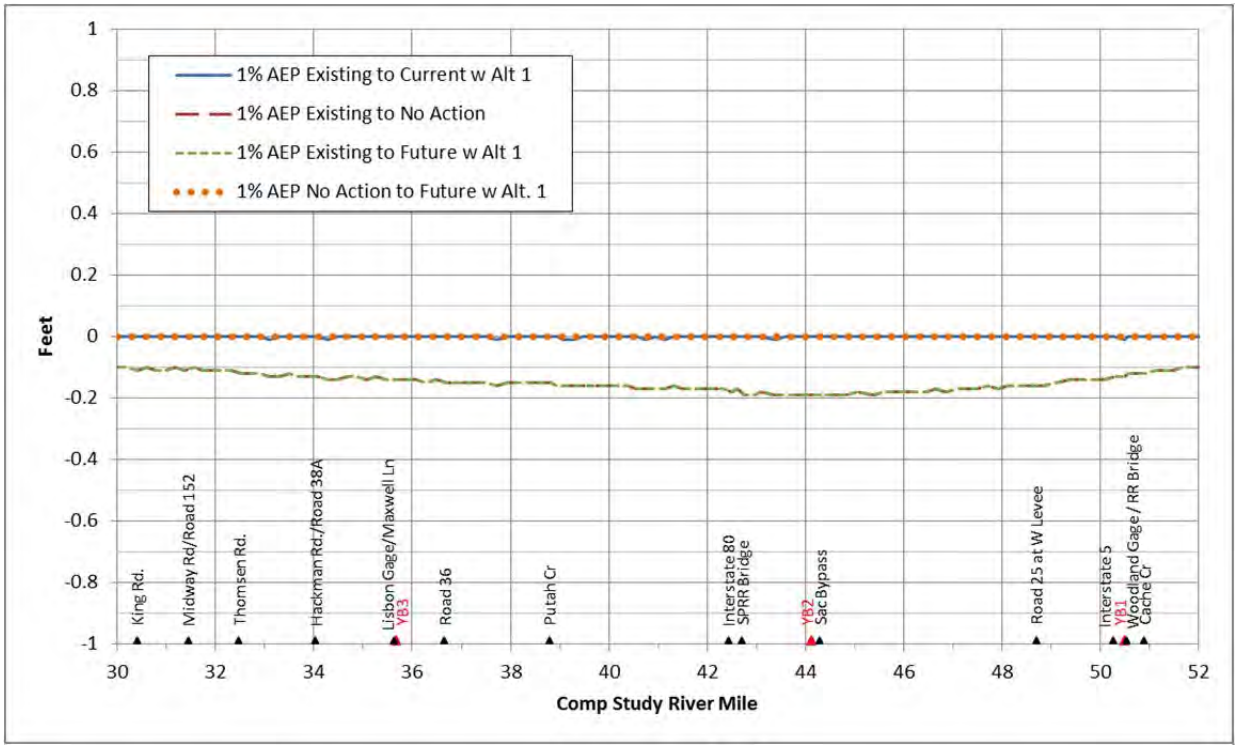


Figure 72. Maximum Water Surface Elevation Impacts; Yolo Bypass; Alternative 1; 1% AEP

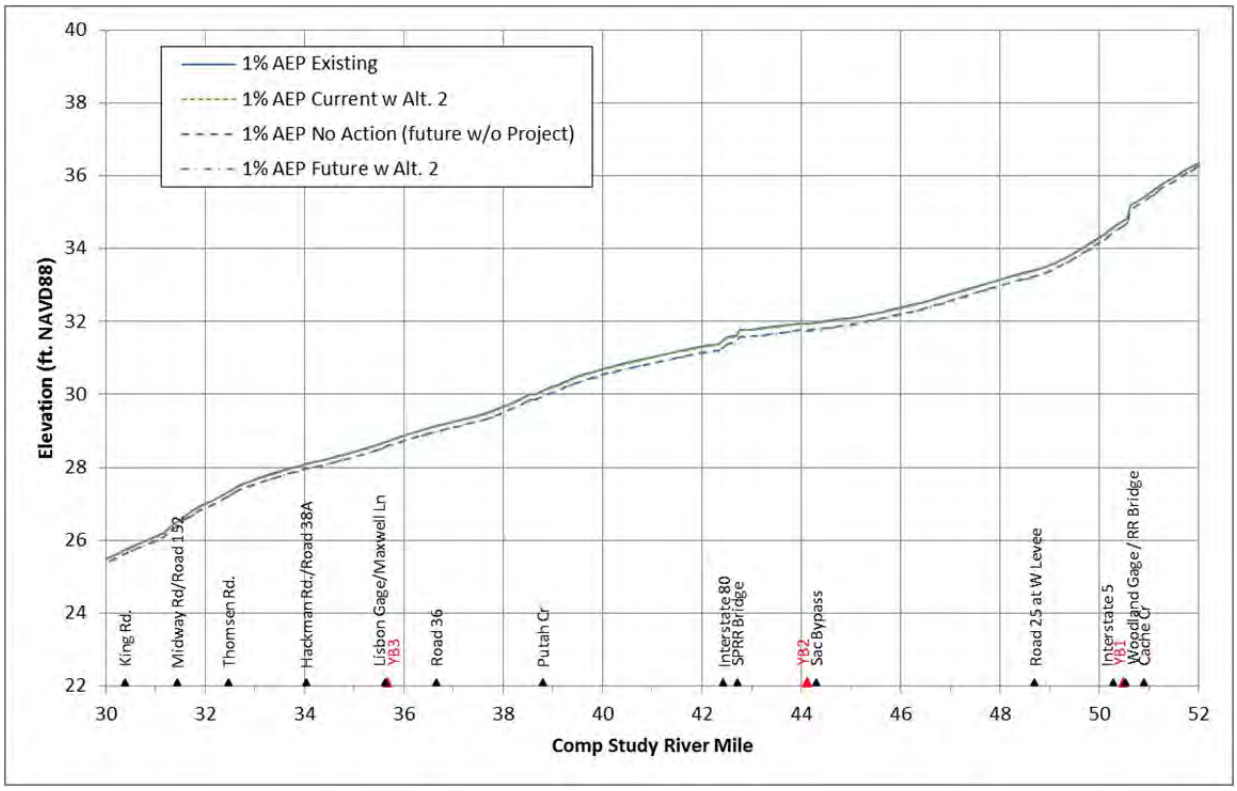


Figure 73. Maximum Water Surface Elevations; Yolo Bypass; Alternative 2; 1% AEP

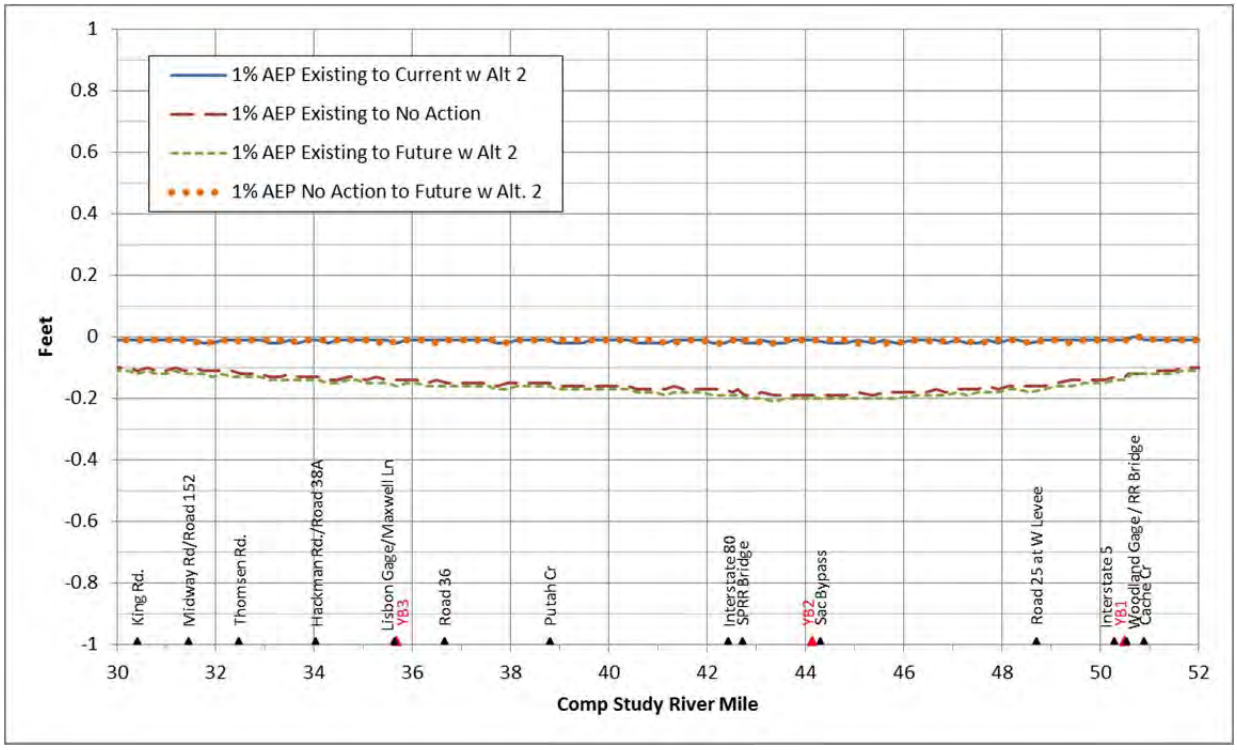


Figure 74. Maximum Water Surface Elevation Impacts; Yolo Bypass; Alternative 2; 1% AEP

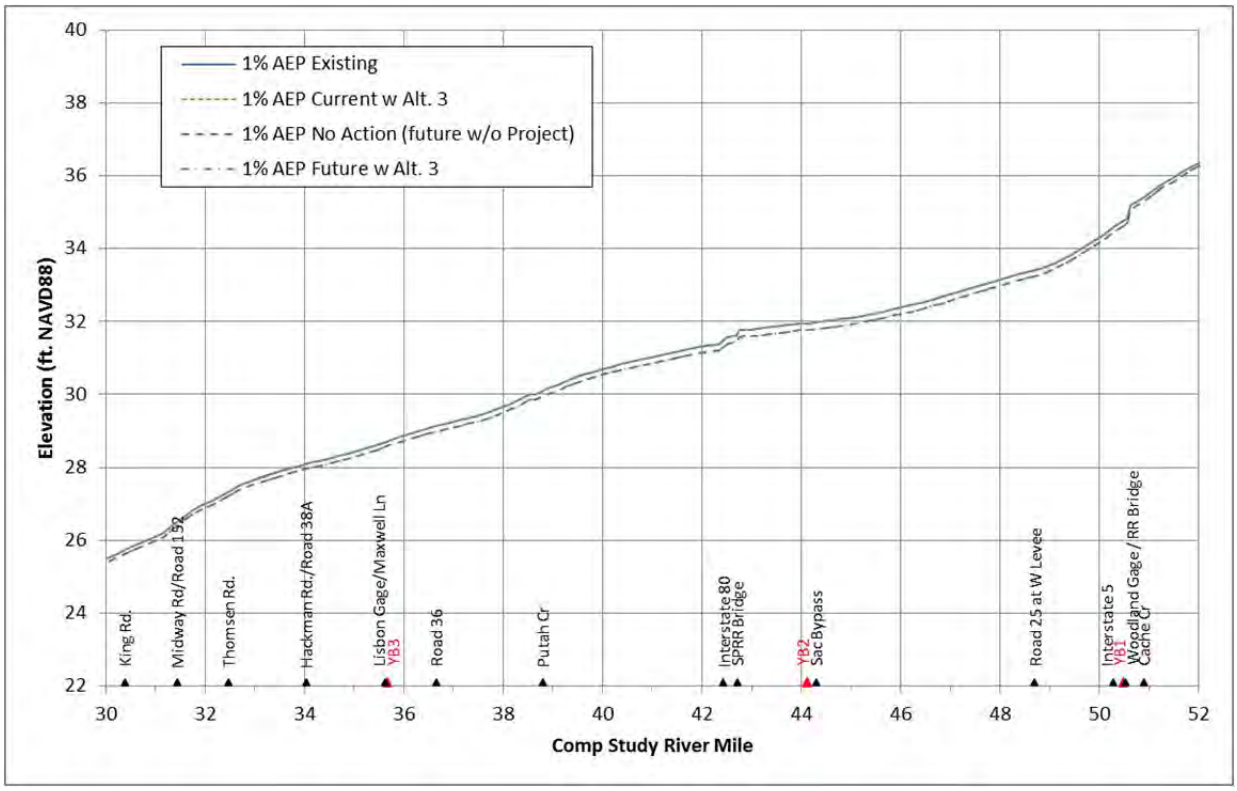


Figure 75. Maximum Water Surface Elevations; Yolo Bypass; Alternative 3; 1% AEP

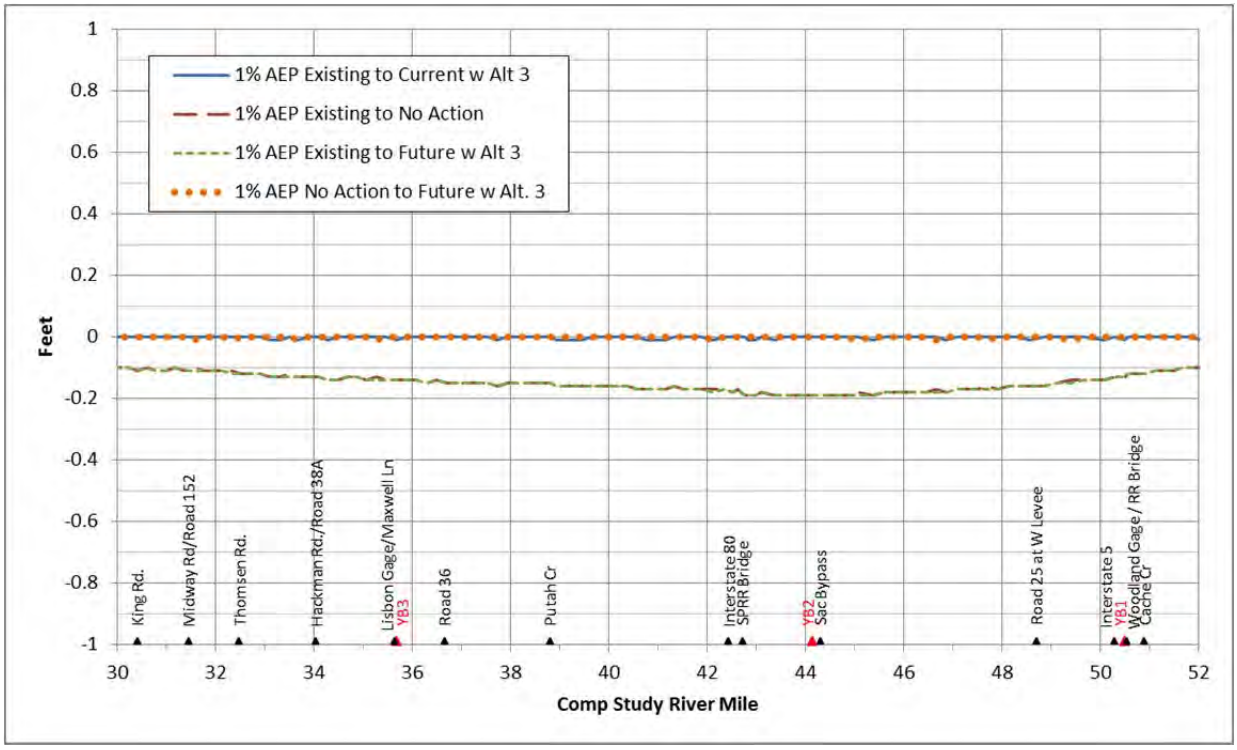


Figure 76. Maximum Water Surface Elevation Impacts; Yolo Bypass; Alternative 3; 1% AEP

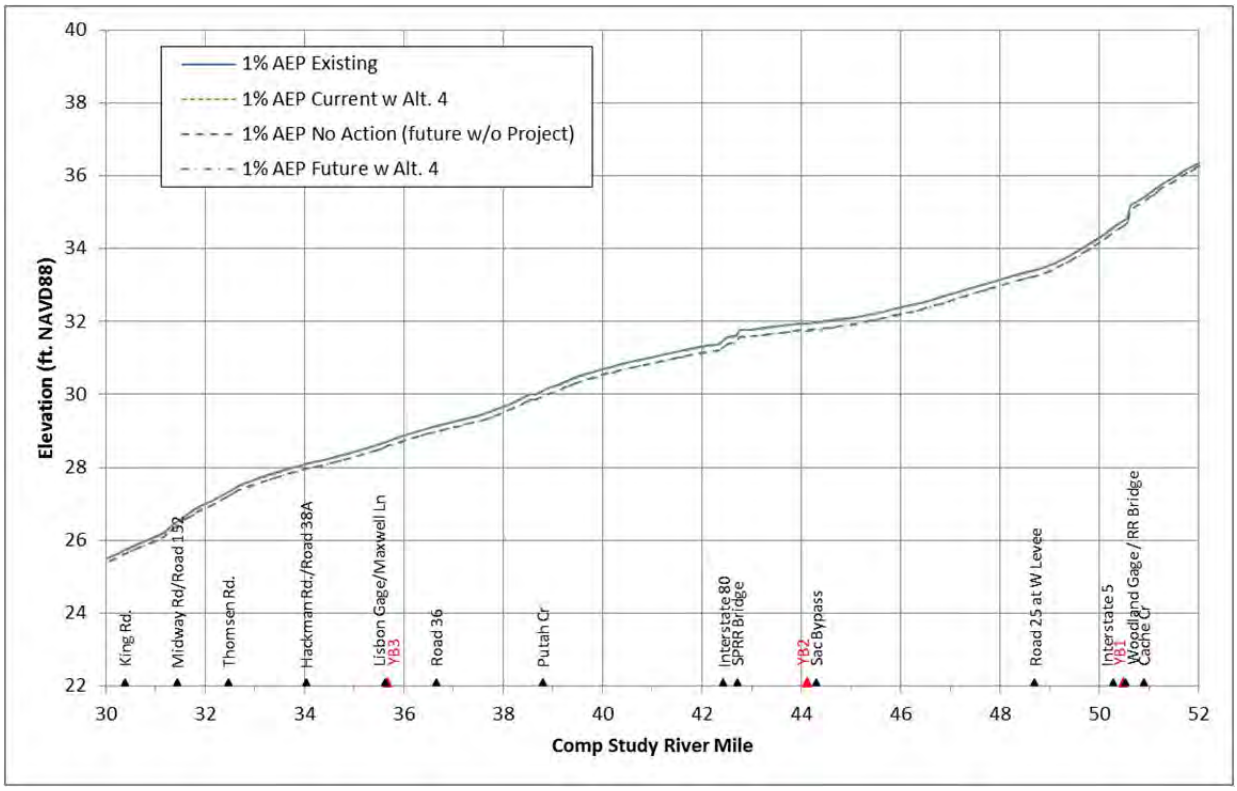


Figure 77. Maximum Water Surface Elevations; Yolo Bypass; Alternative 4; 1% AEP

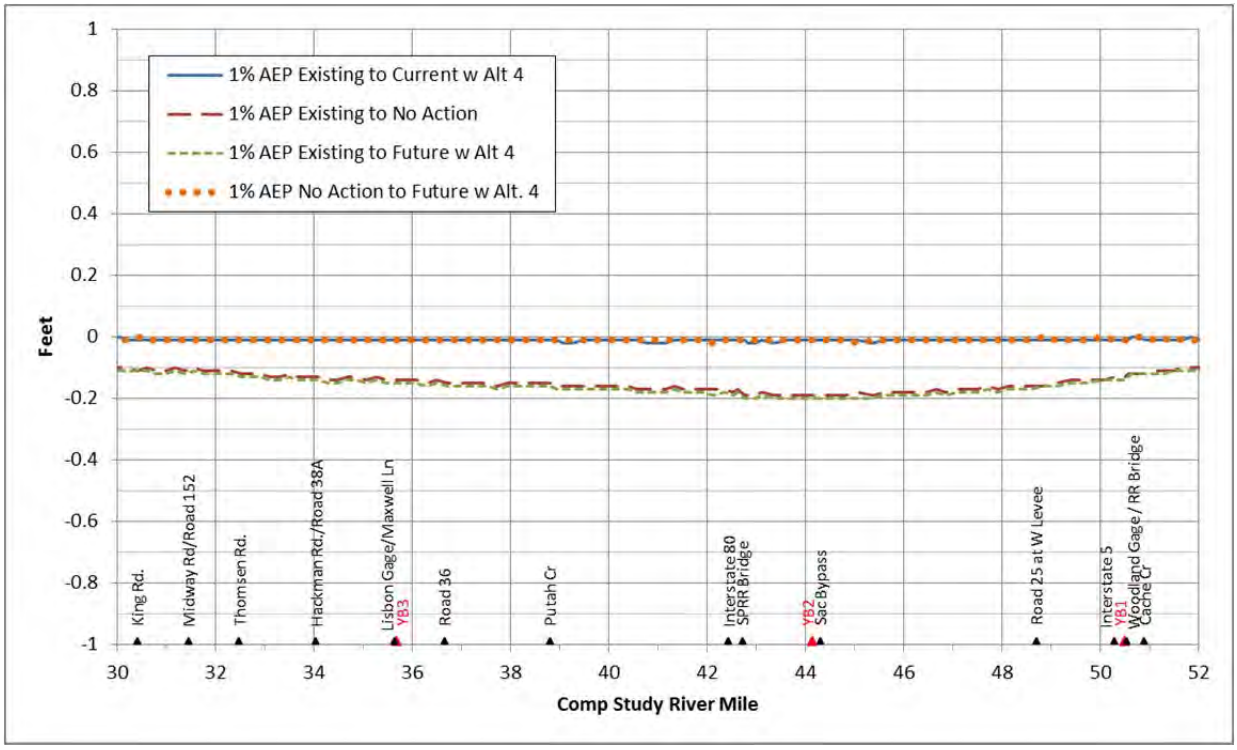


Figure 78. Maximum Water Surface Elevation Impacts; Yolo Bypass; Alternative 4; 1% AEP

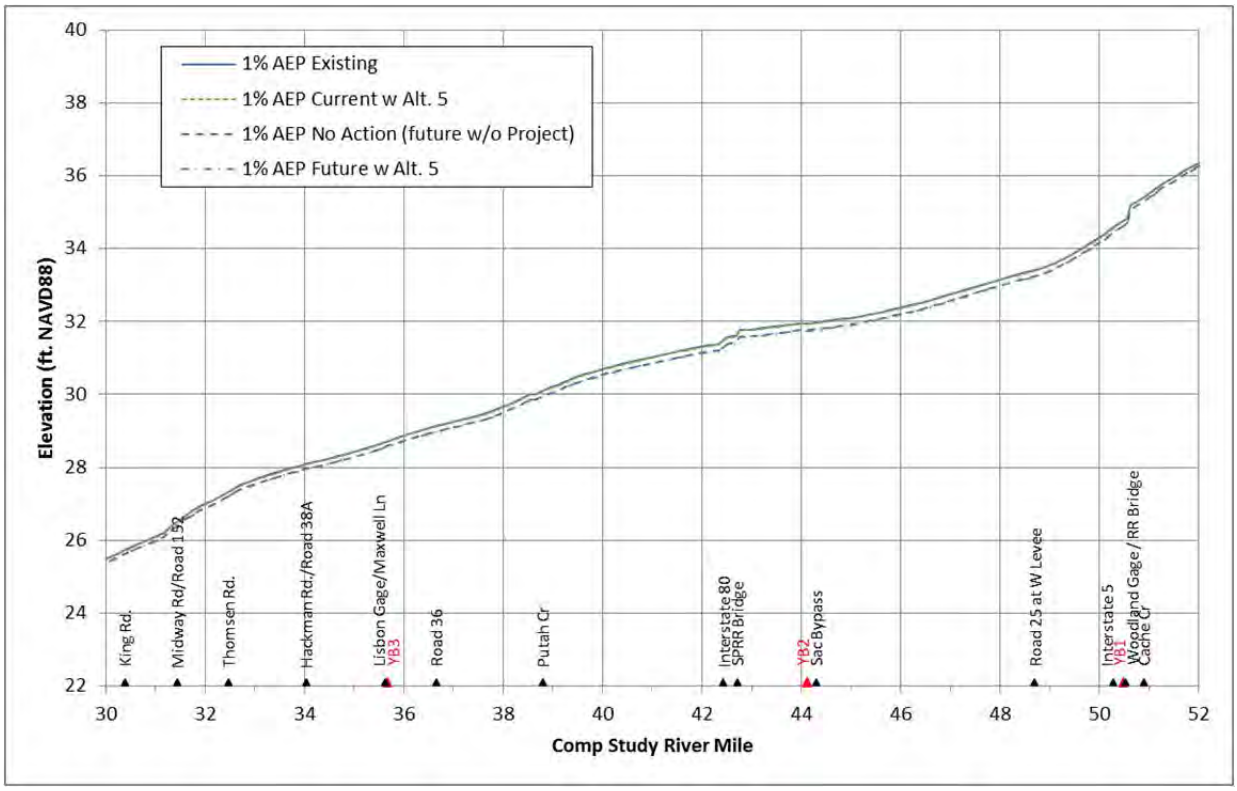


Figure 79. Maximum Water Surface Elevations; Yolo Bypass; Alternative 5; 1% AEP

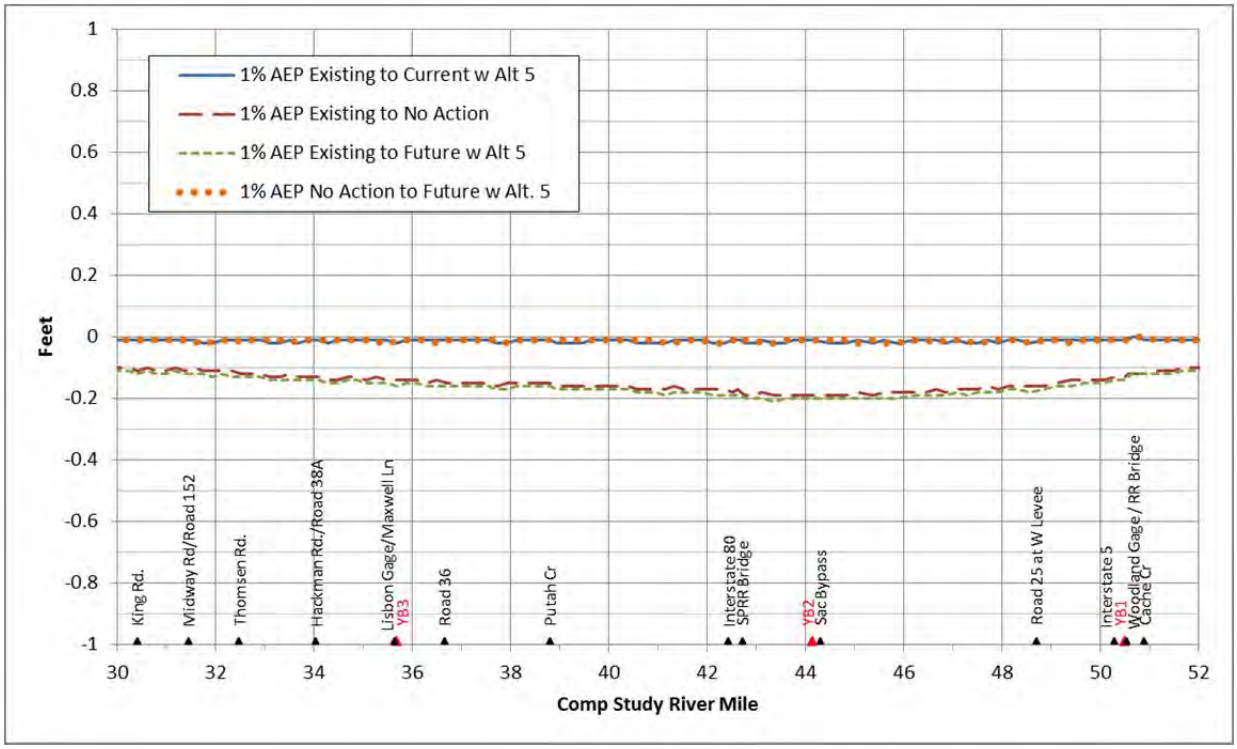


Figure 80. Maximum Water Surface Elevation Impacts; Yolo Bypass; Alternative 5; 1% AEP

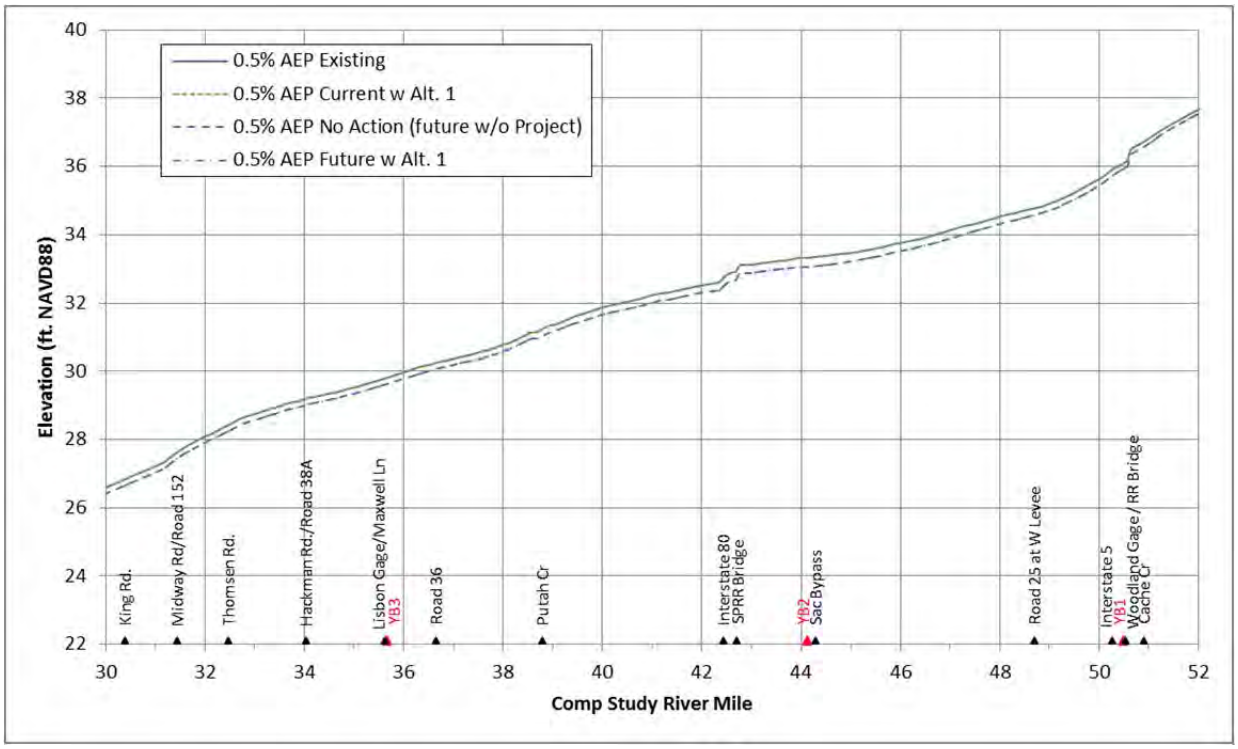


Figure 81. Maximum Water Surface Elevations; Yolo Bypass; Alternative 1; 0.5% AEP

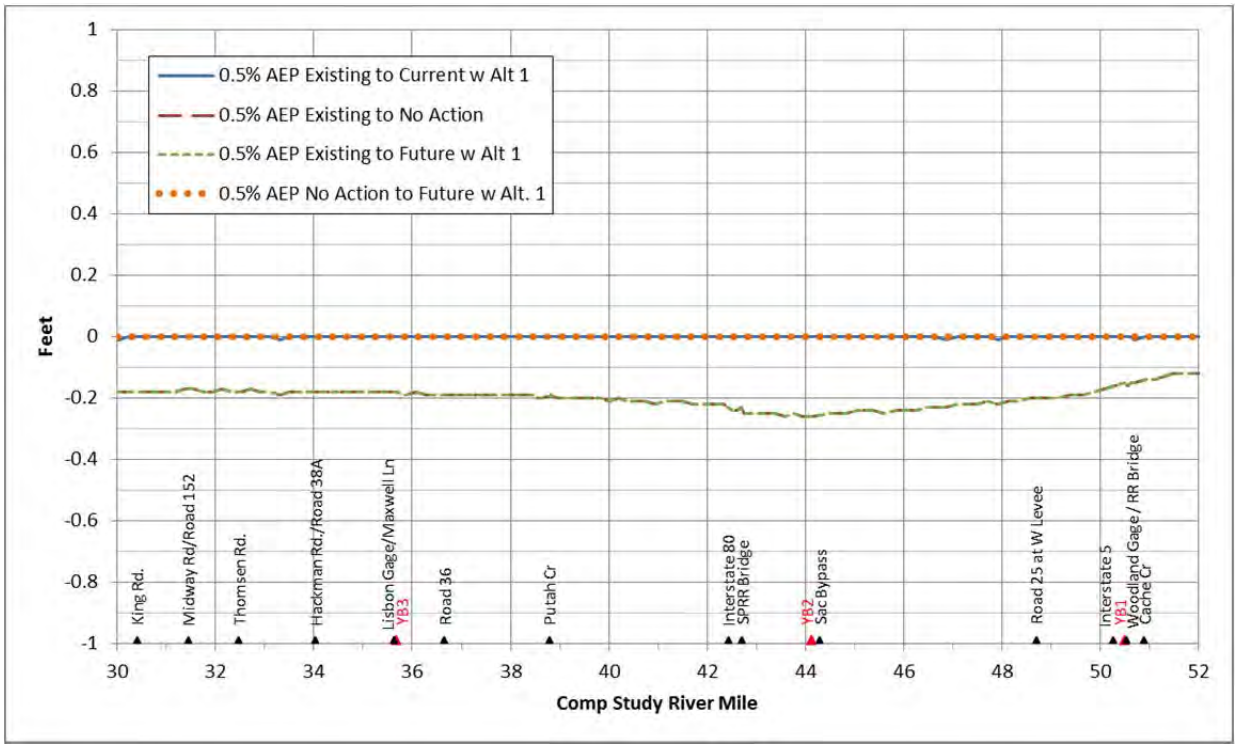


Figure 82. Maximum Water Surface Elevation Impacts; Yolo Bypass; Alternative 1; 0.5% AEP

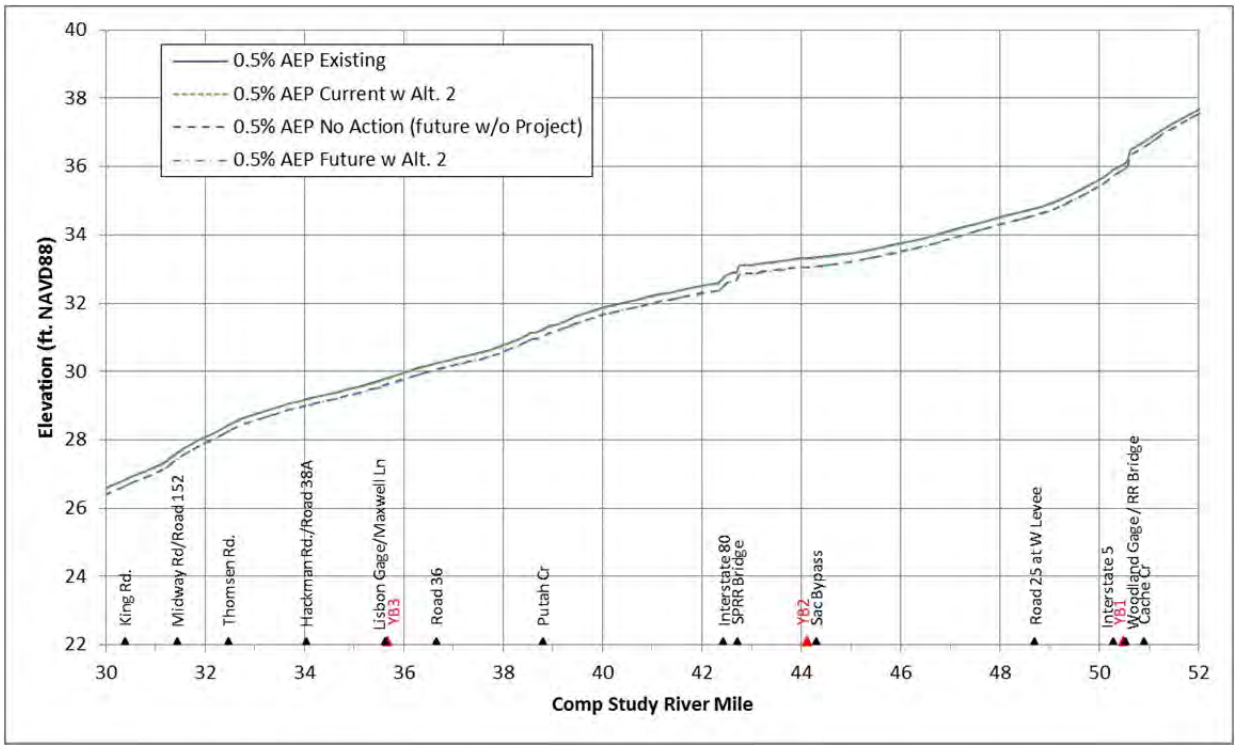


Figure 83. Maximum Water Surface Elevations; Yolo Bypass; Alternative 2; 0.5% AEP

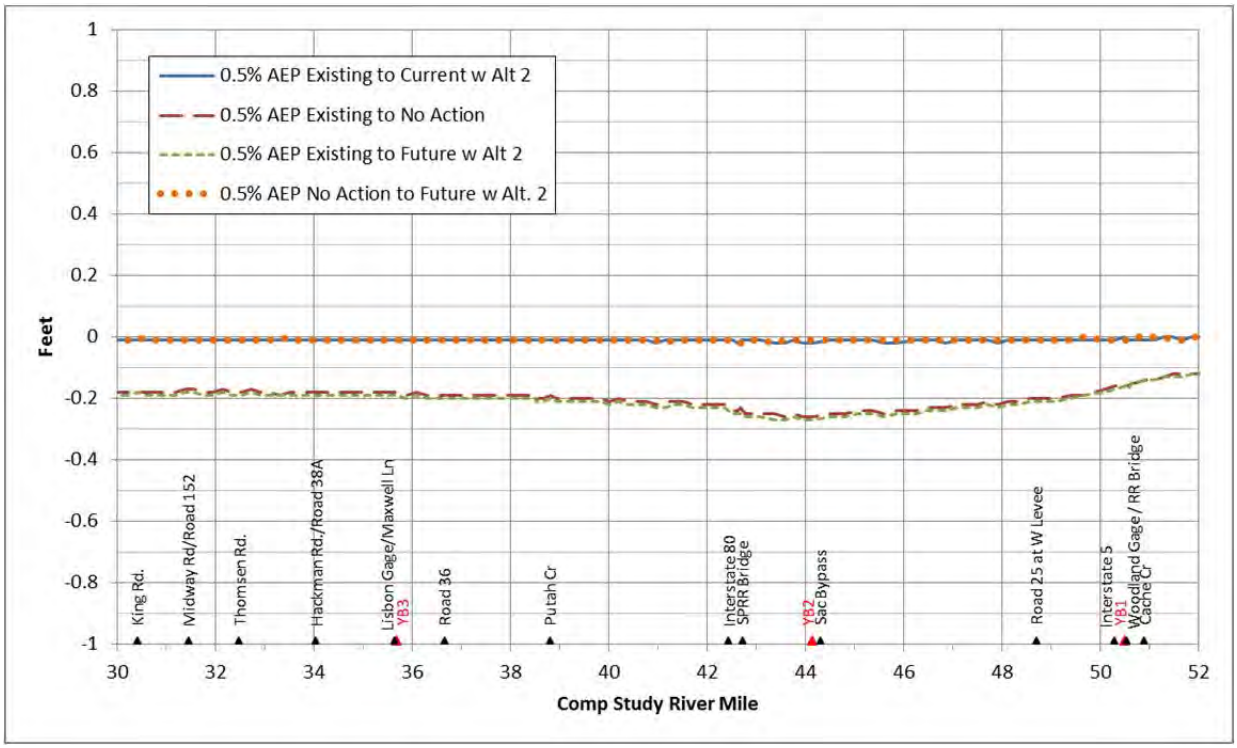


Figure 84. Maximum Water Surface Elevation Impacts; Yolo Bypass; Alternative 2; 0.5% AEP

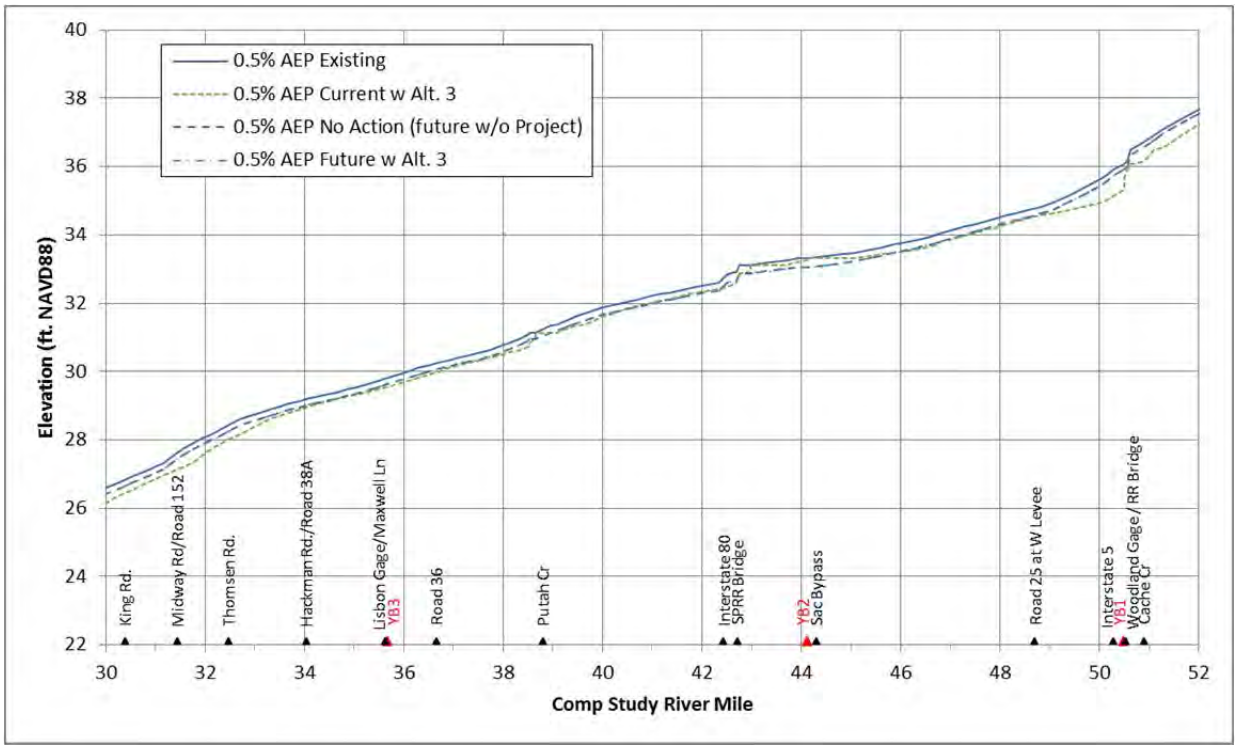


Figure 85. Maximum Water Surface Elevations; Yolo Bypass; Alternative 3; 0.5% AEP

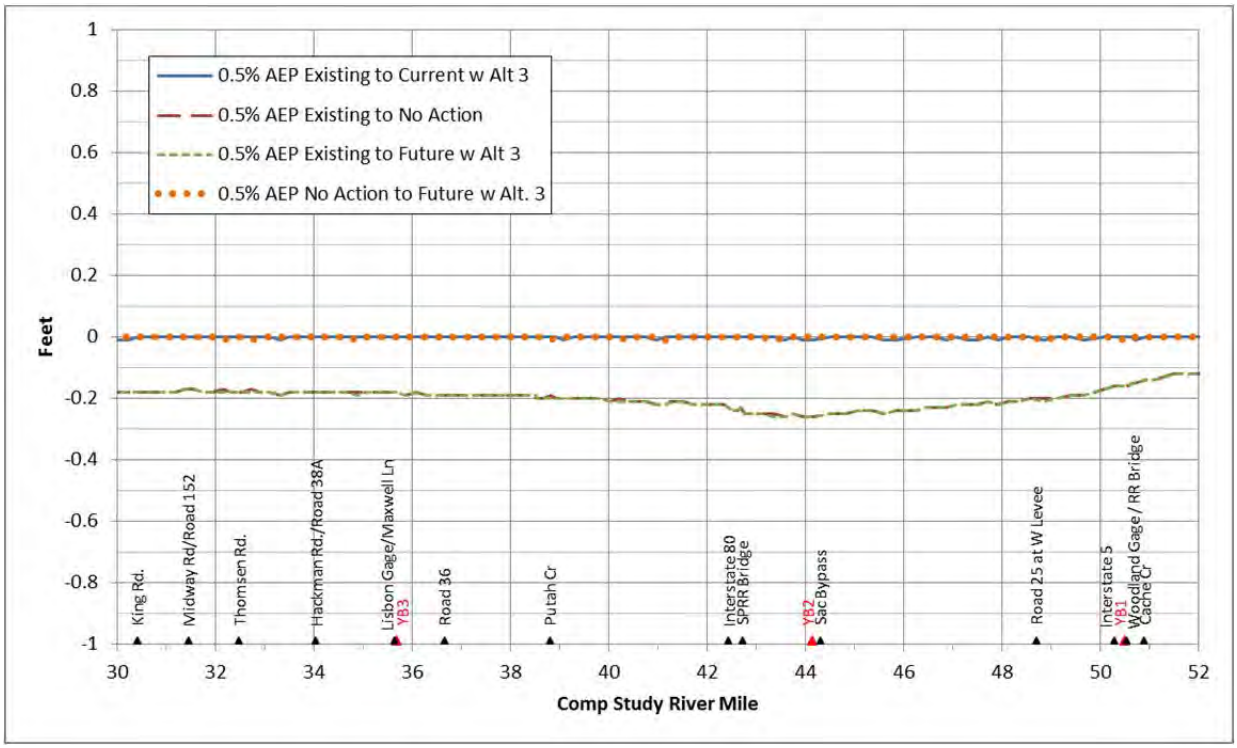


Figure 86. Maximum Water Surface Elevation Impacts; Yolo Bypass; Alternative 3; 0.5% AEP

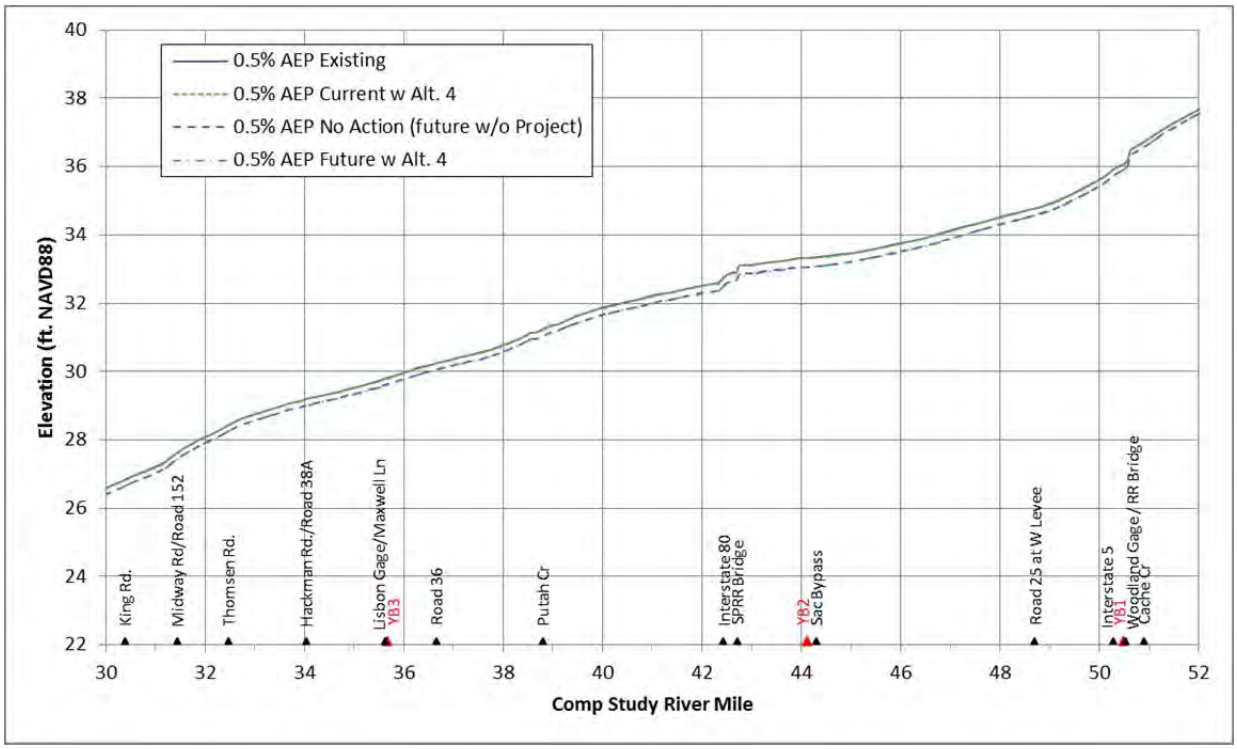


Figure 87. Maximum Water Surface Elevations; Yolo Bypass; Alternative 4; 0.5% AEP

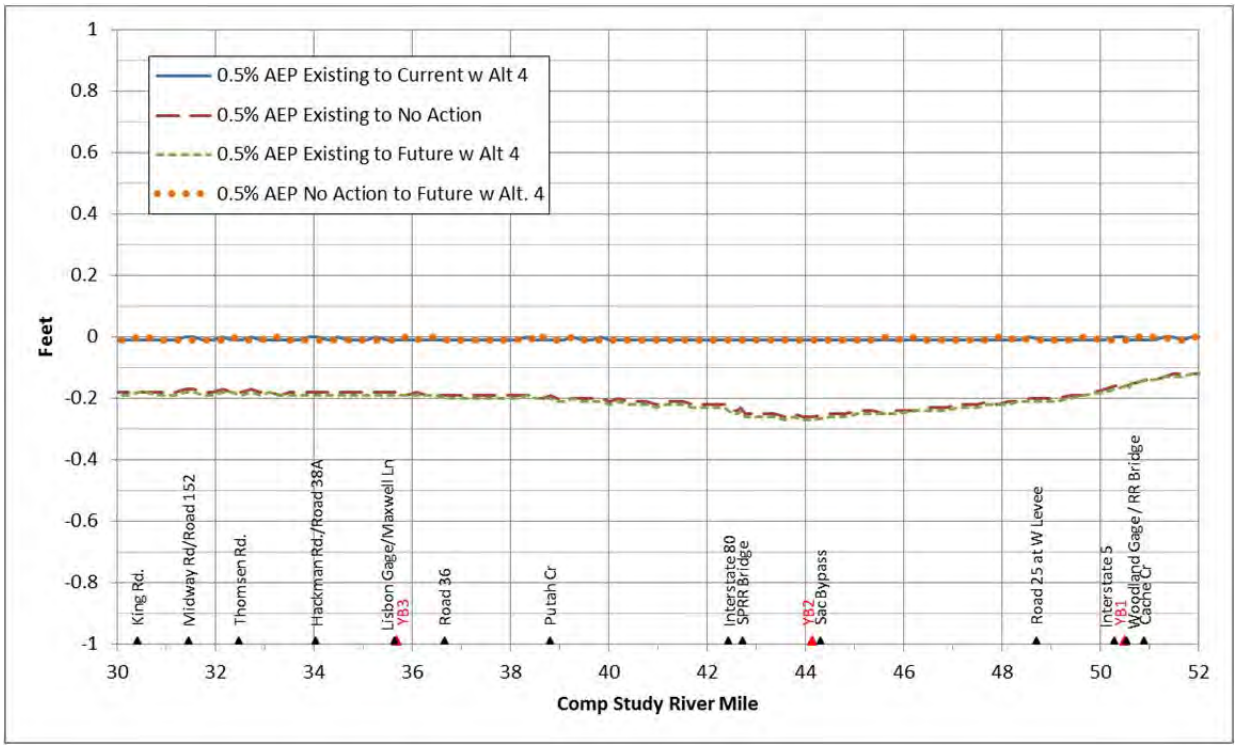


Figure 88. Maximum Water Surface Elevation Impacts; Yolo Bypass; Alternative 4; 0.5% AEP

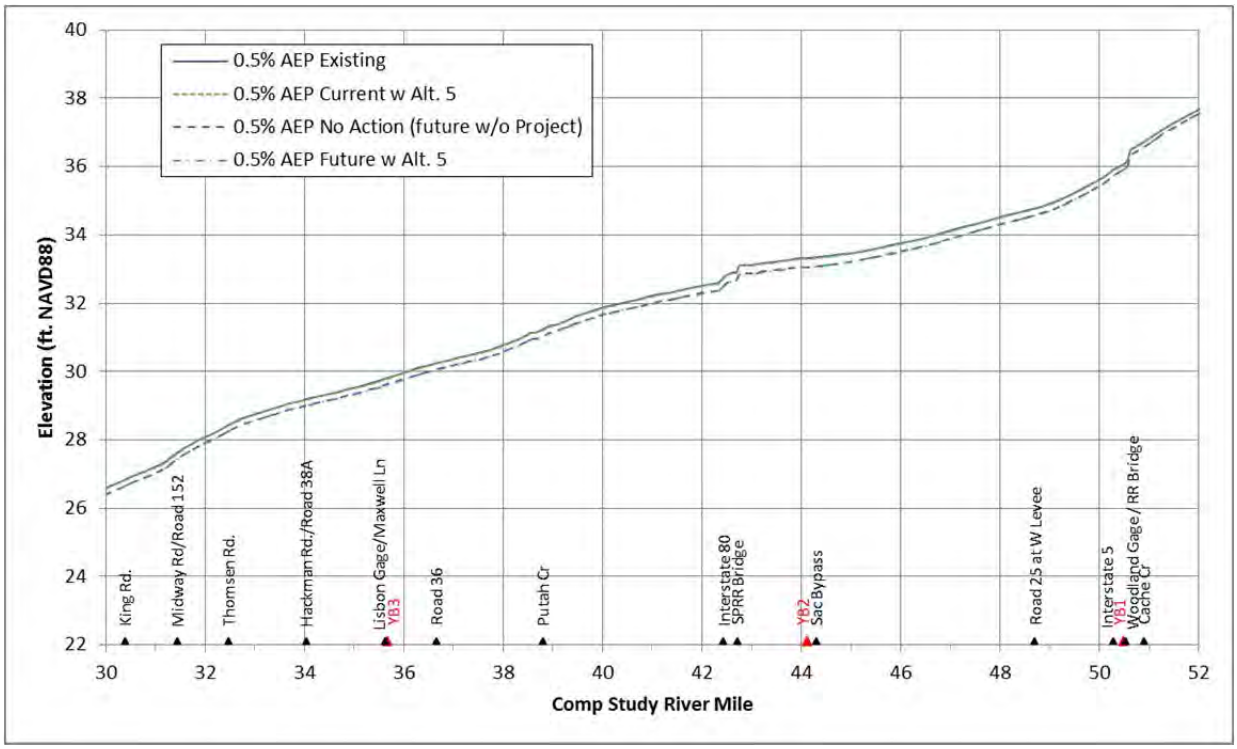


Figure 89. Maximum Water Surface Elevations; Yolo Bypass; Alternative 5; 0.5% AEP

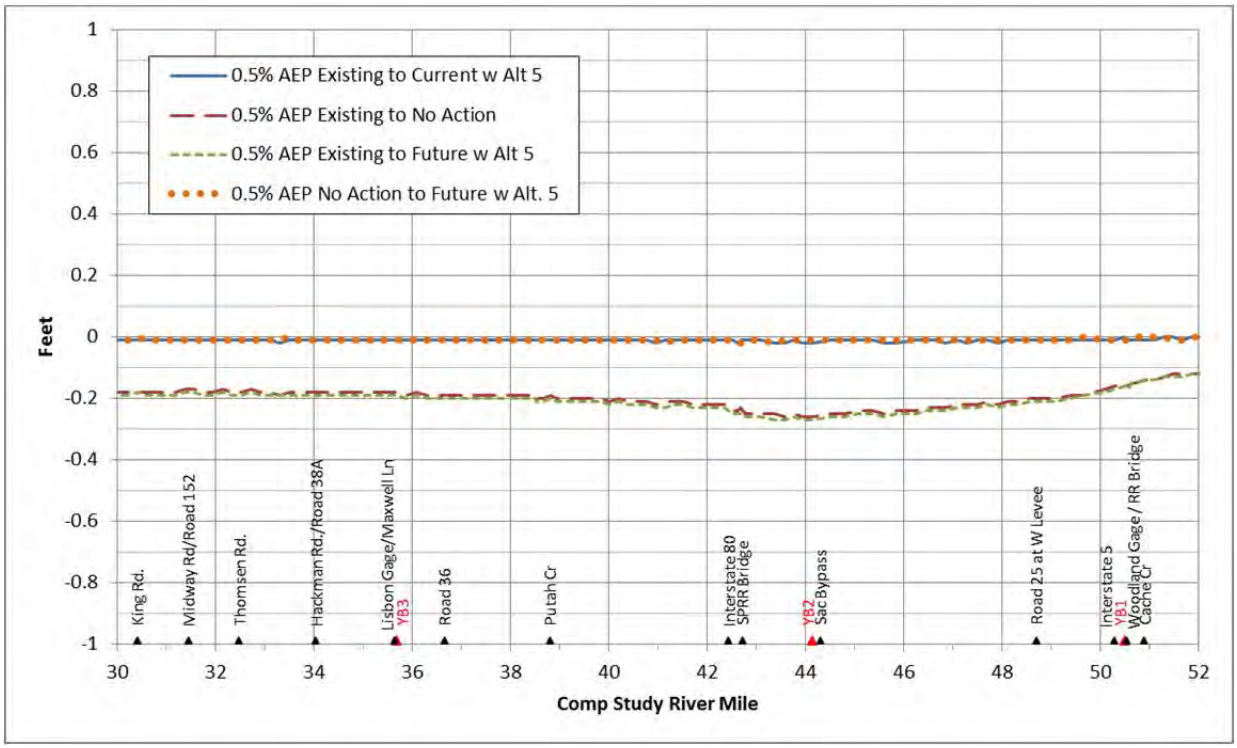


Figure 90. Maximum Water Surface Elevation Impacts; Yolo Bypass; Alternative 5; 0.5% AEP

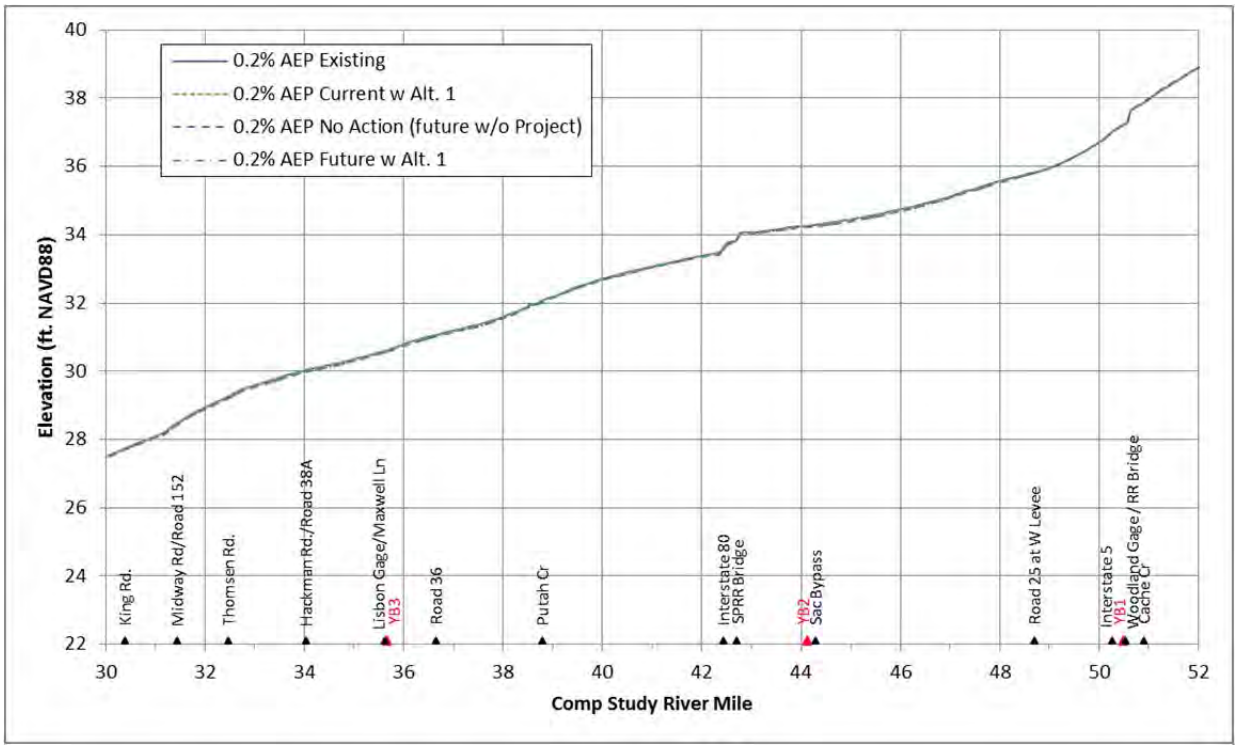


Figure 91. Maximum Water Surface Elevations; Yolo Bypass; Alternative 1; 0.2% AEP

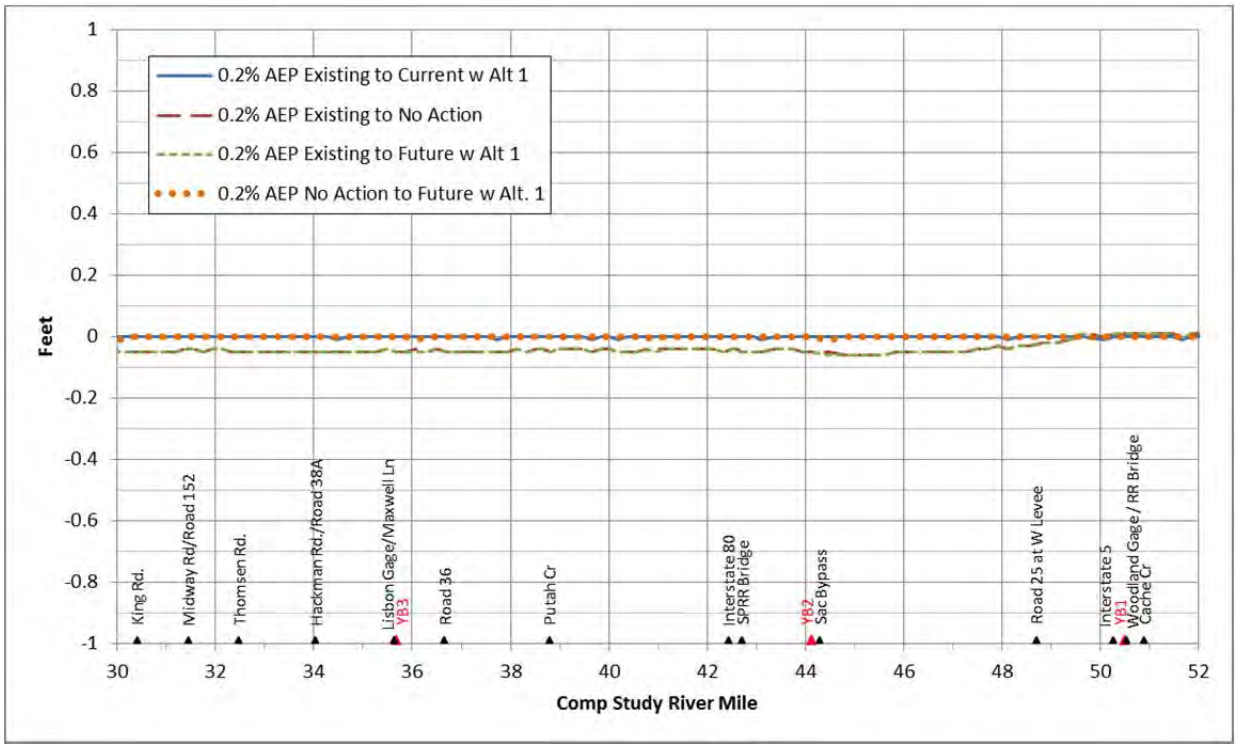


Figure 92. Maximum Water Surface Elevation Impacts; Yolo Bypass; Alternative 1; 0.2% AEP

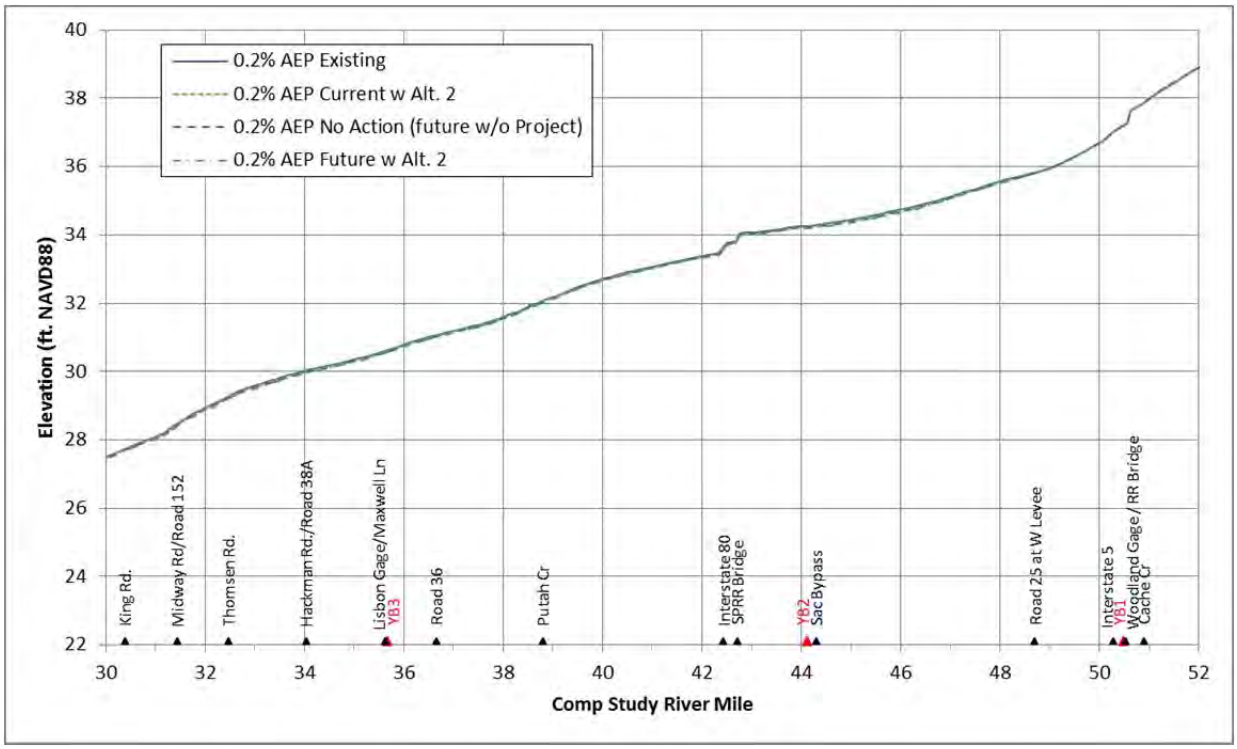


Figure 93. Maximum Water Surface Elevations; Yolo Bypass; Alternative 2; 0.2% AEP

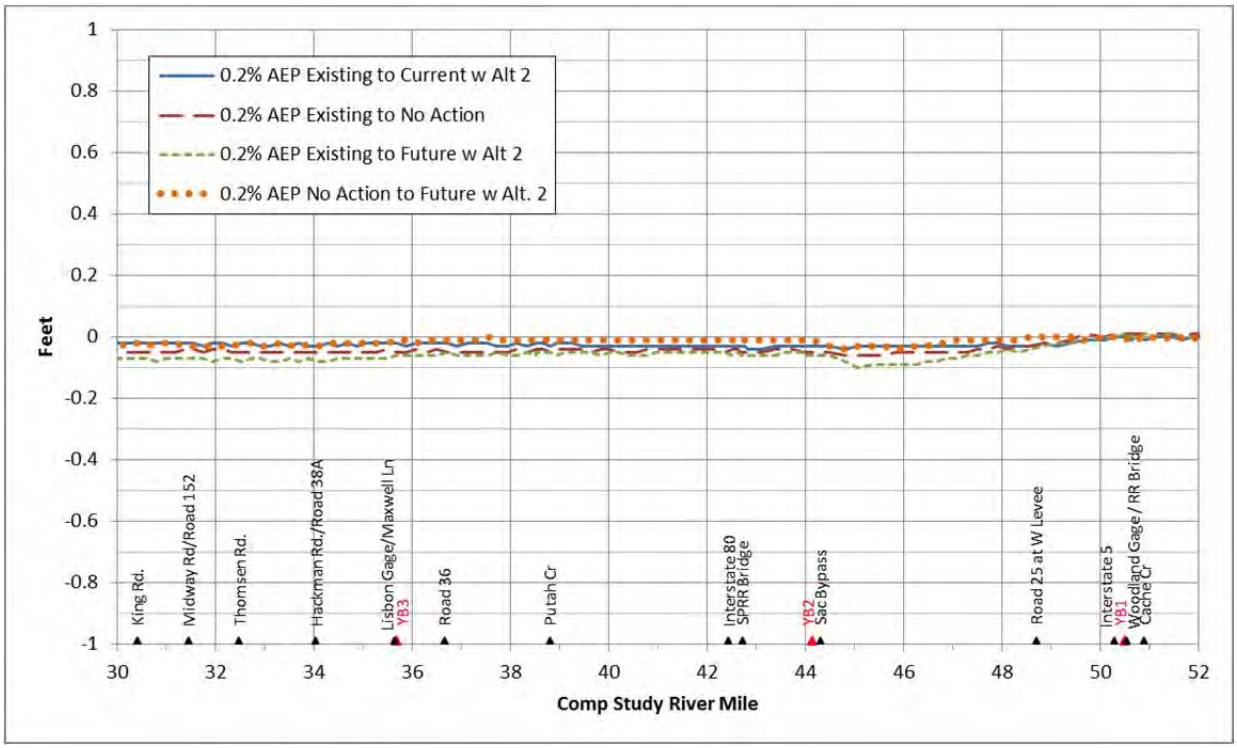


Figure 94. Maximum Water Surface Elevation Impacts; Yolo Bypass; Alternative 2; 0.2% AEP

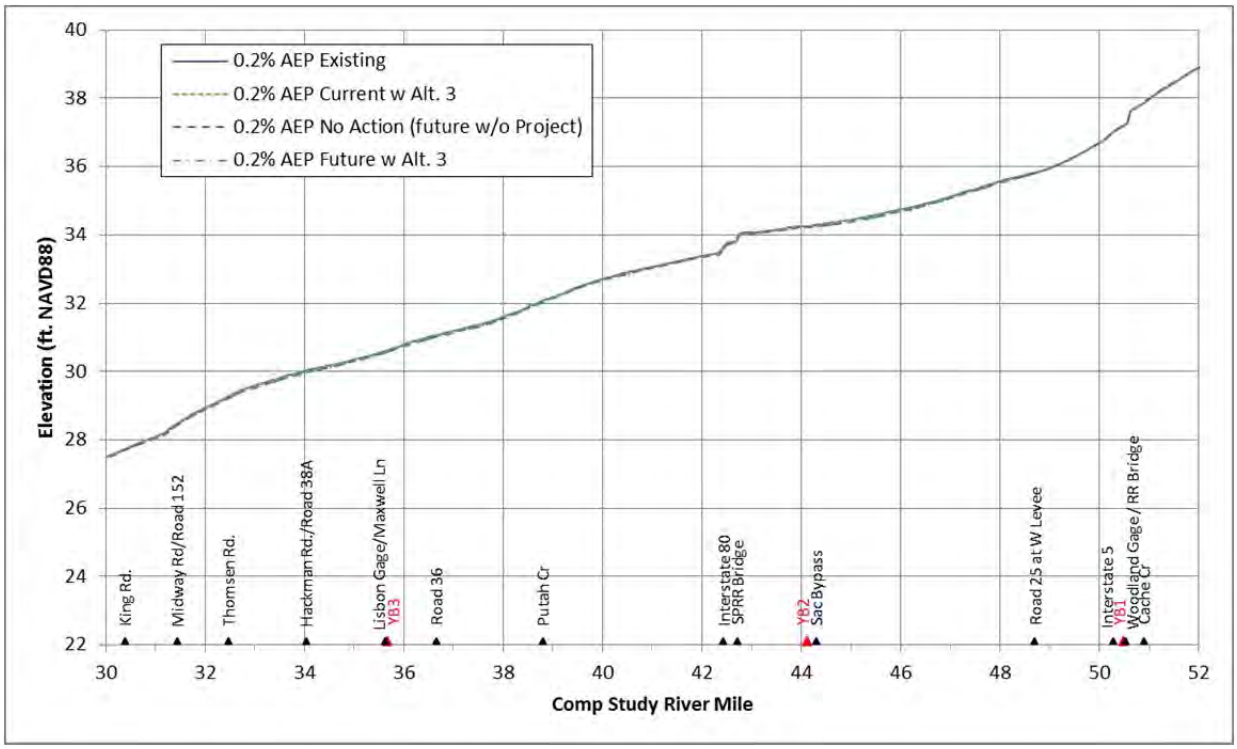


Figure 95. Maximum Water Surface Elevations; Yolo Bypass; Alternative 3; 0.2% AEP

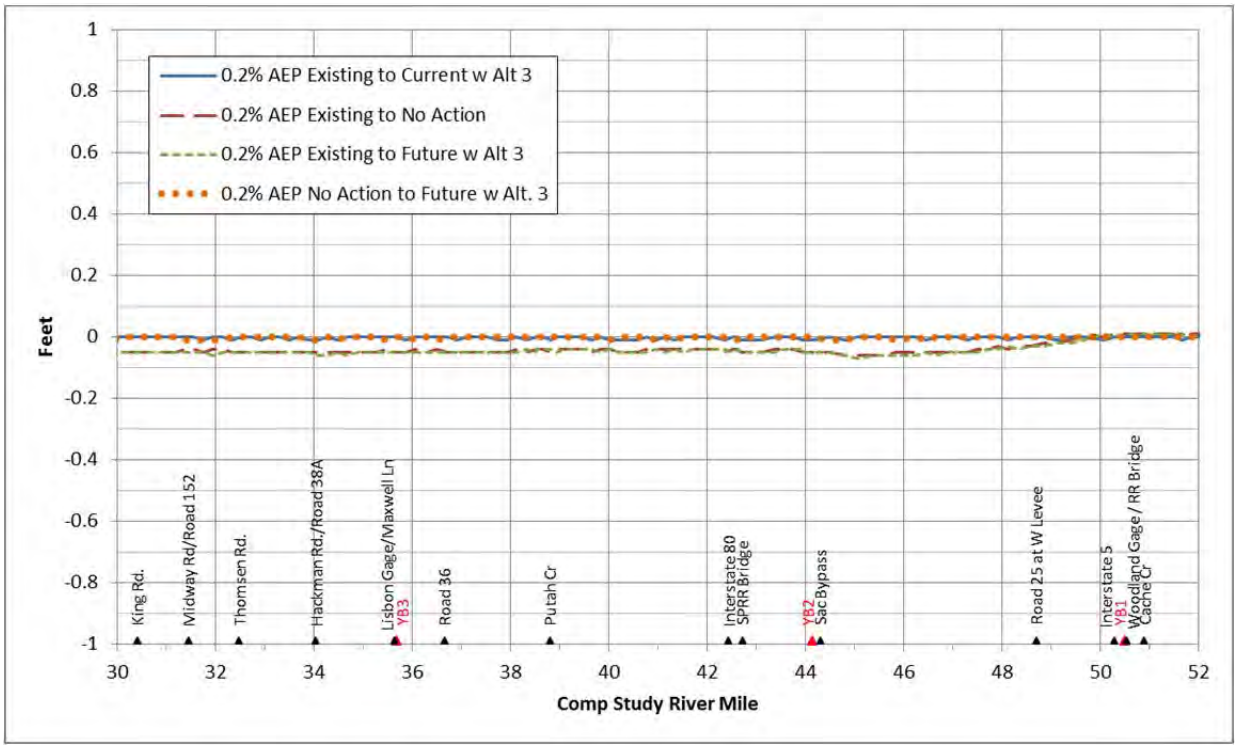


Figure 96. Maximum Water Surface Elevation Impacts; Yolo Bypass; Alternative 3; 0.2% AEP

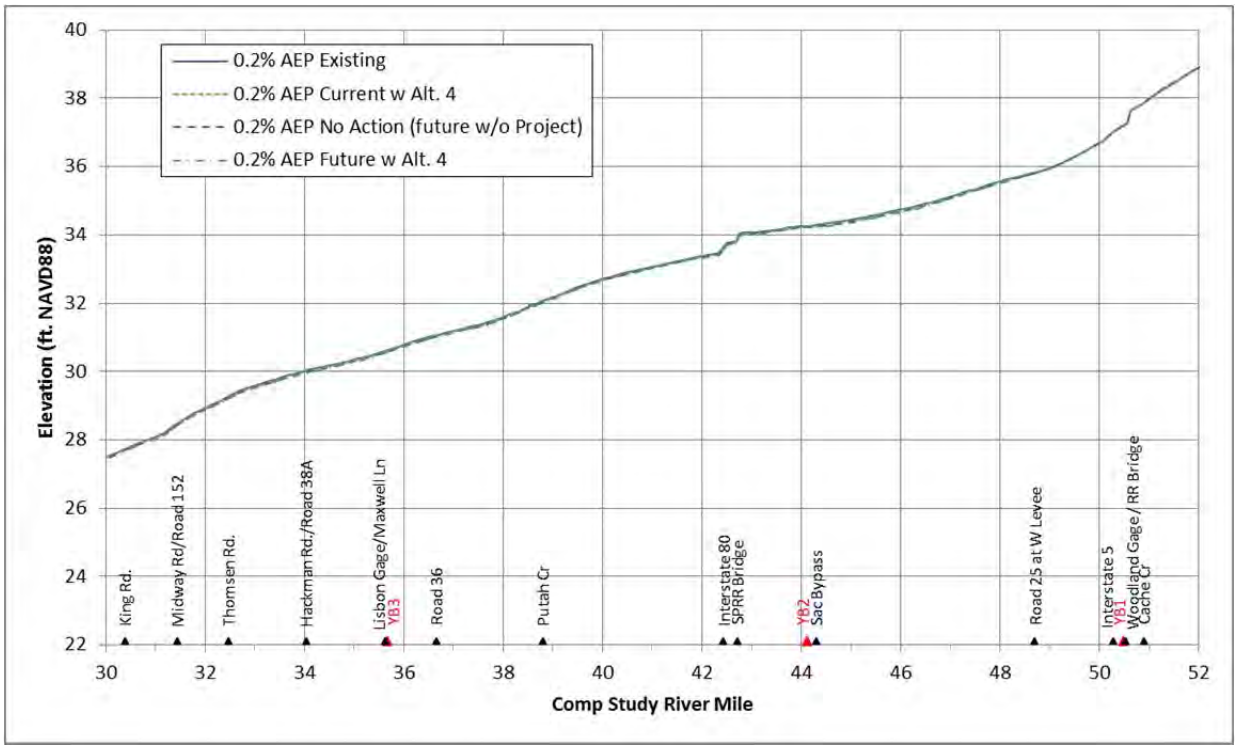


Figure 97. Maximum Water Surface Elevations; Yolo Bypass; Alternative 4; 0.2% AEP

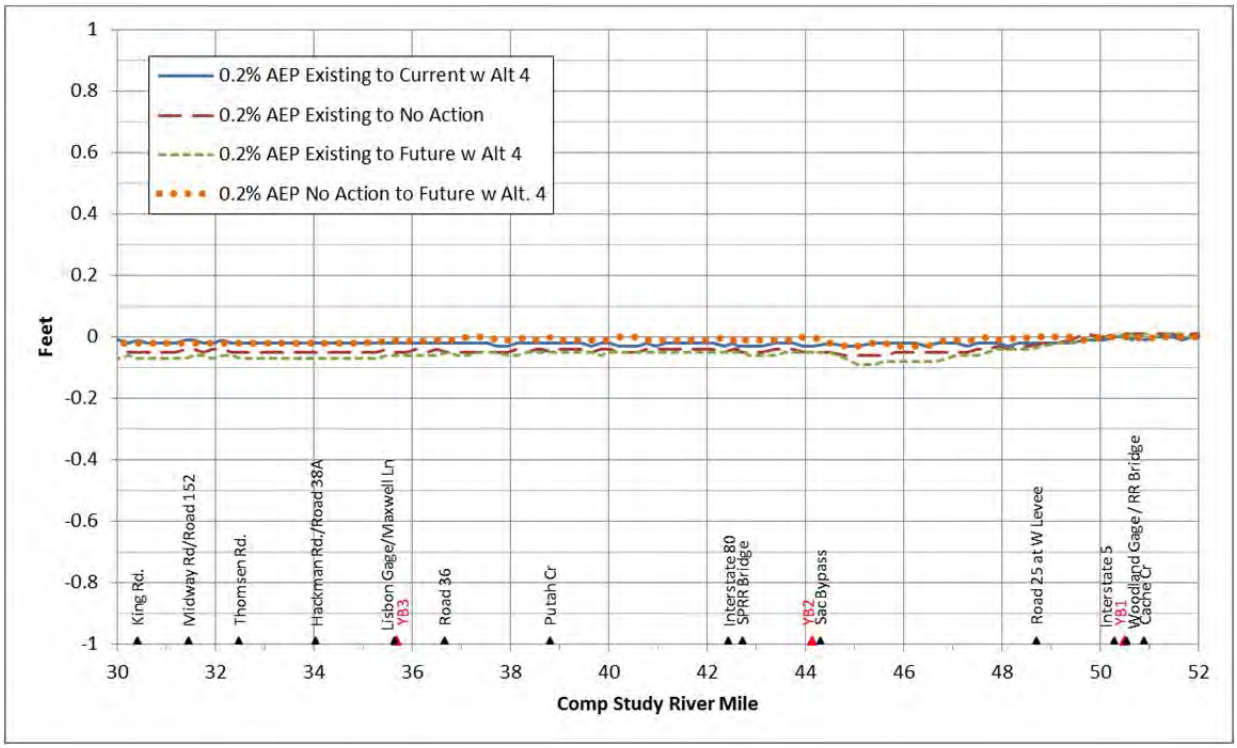


Figure 98. Maximum Water Surface Elevation Impacts; Yolo Bypass; Alternative 4; 0.2% AEP

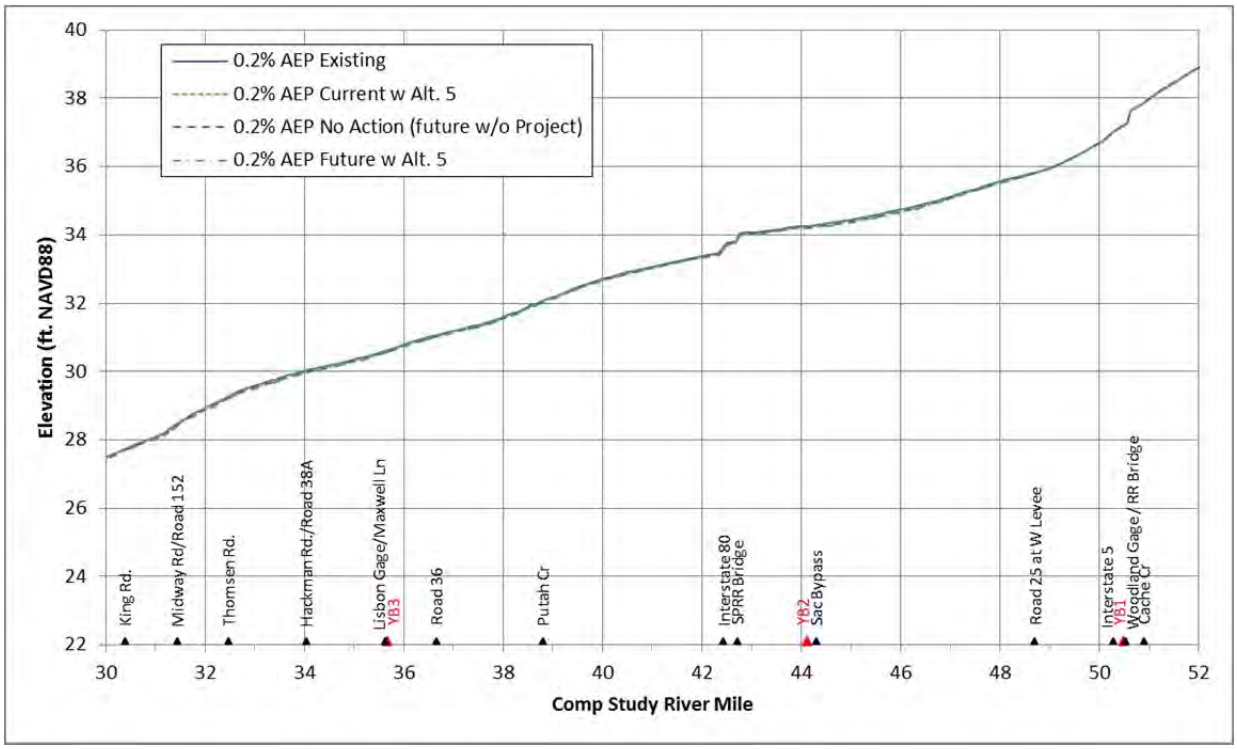


Figure 99. Maximum Water Surface Elevations; Yolo Bypass; Alternative 5; 0.2% AEP

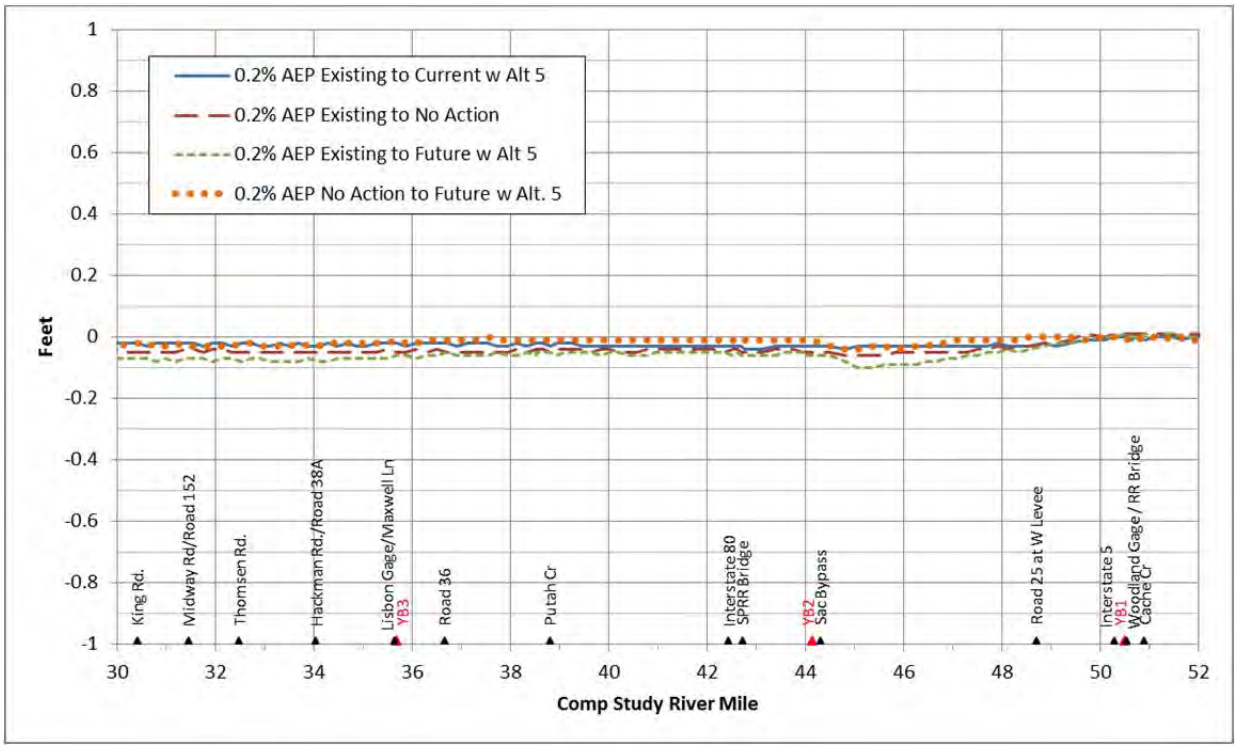


Figure 100. Maximum Water Surface Elevation Impacts; Yolo Bypass; Alternative 5; 0.2% AEP

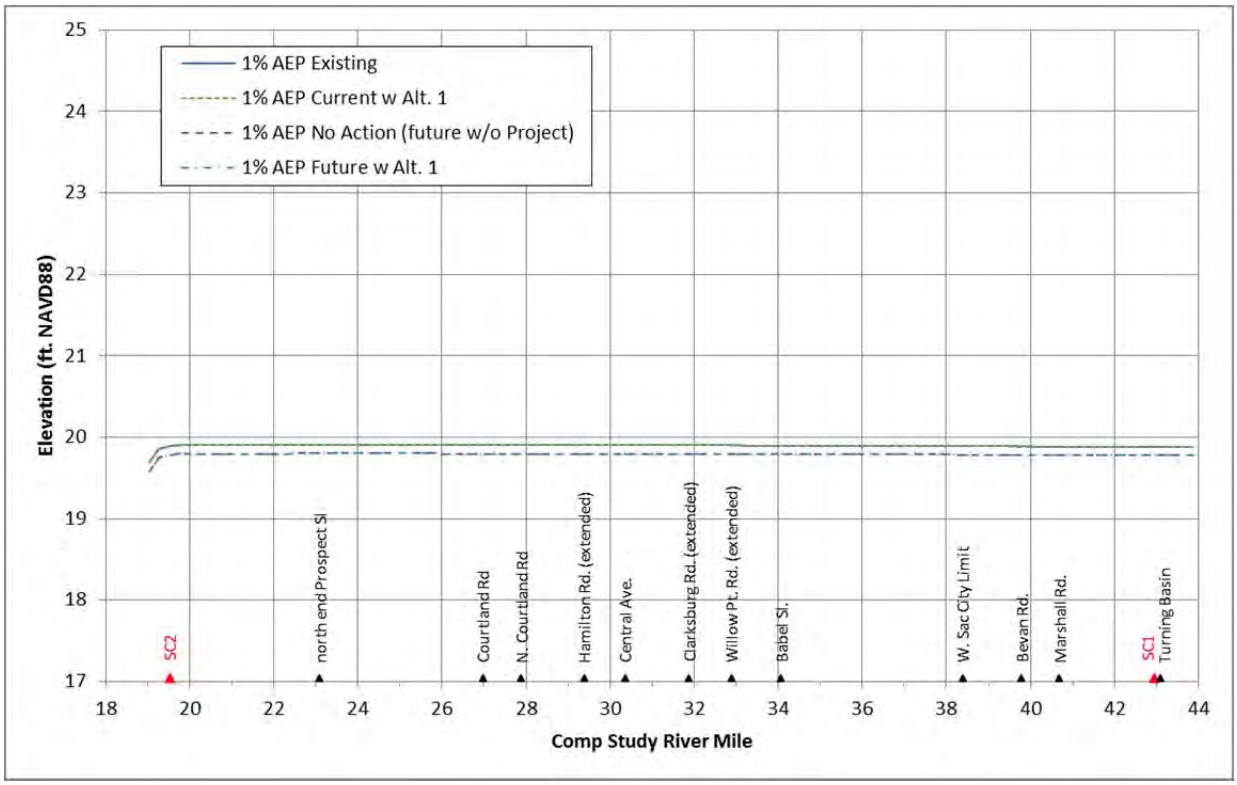


Figure 101. Maximum Water Surface Elevations; Deep Water Ship Channel; Alternative 1; 1% AEP

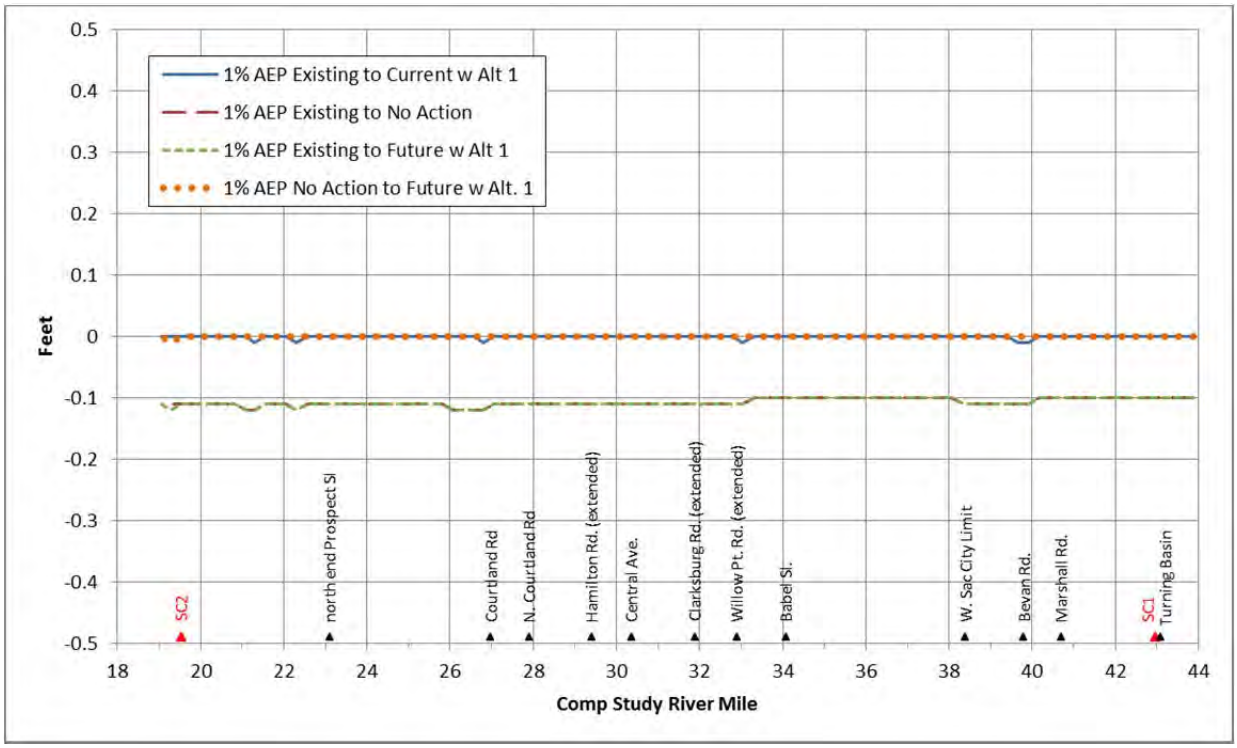


Figure 102. Maximum Water Surface Elevation Impacts; Deep Water Ship Channel; Alternative 1; 1% AEP

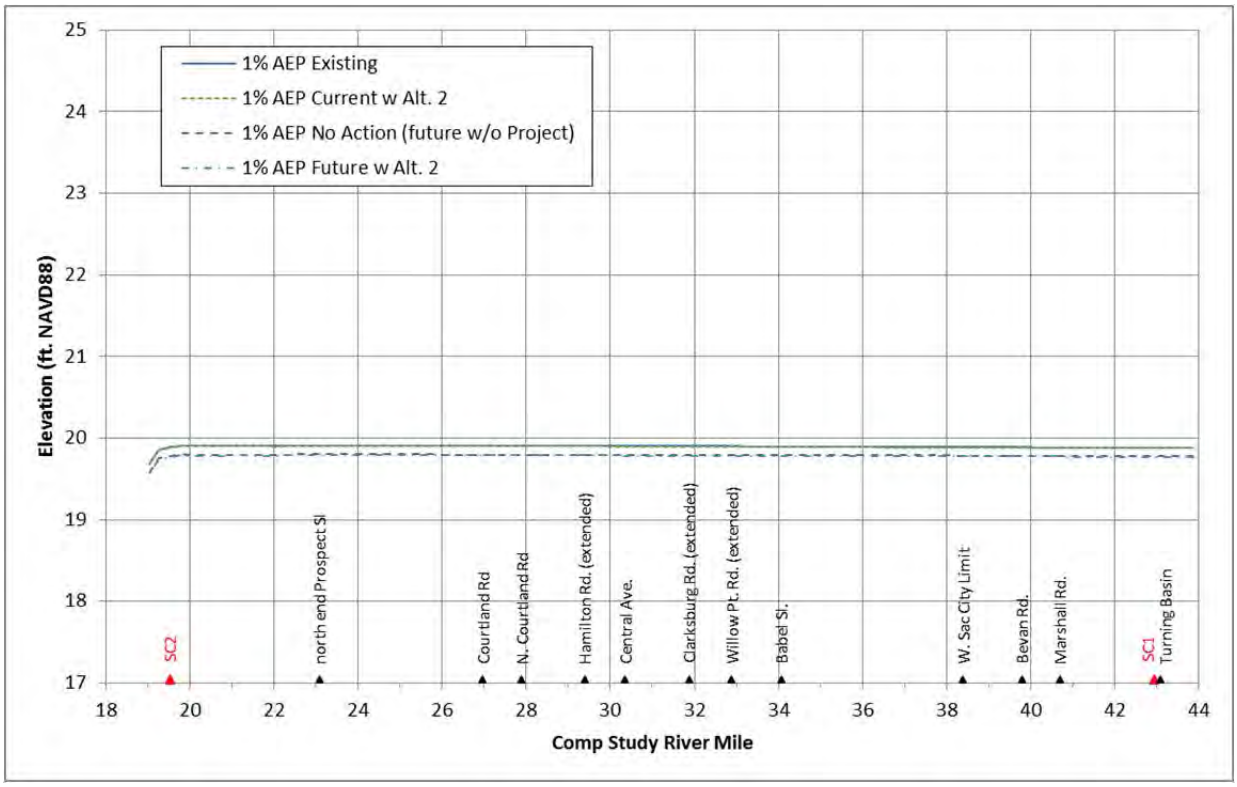


Figure 103. Maximum Water Surface Elevations; Deep Water Ship Channel; Alternative 2; 1% AEP

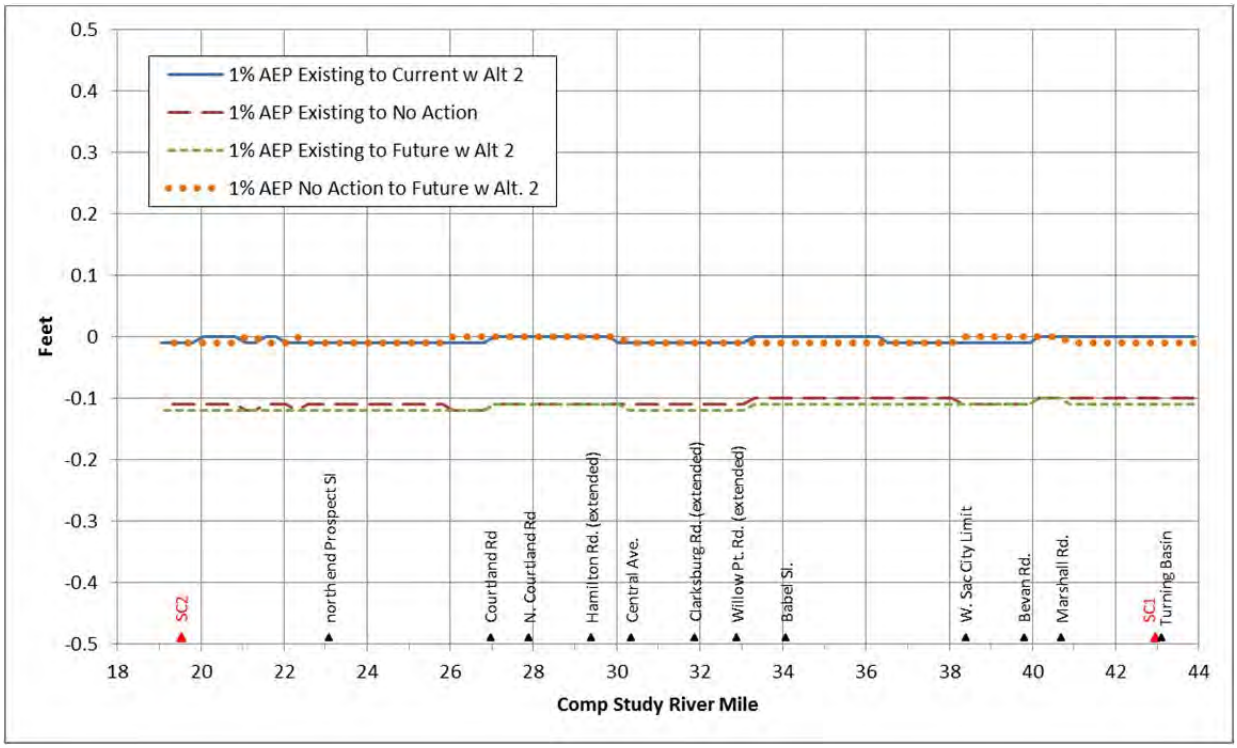


Figure 104. Maximum Water Surface Elevation Impacts; Deep Water Ship Channel; Alternative 2; 1% AEP

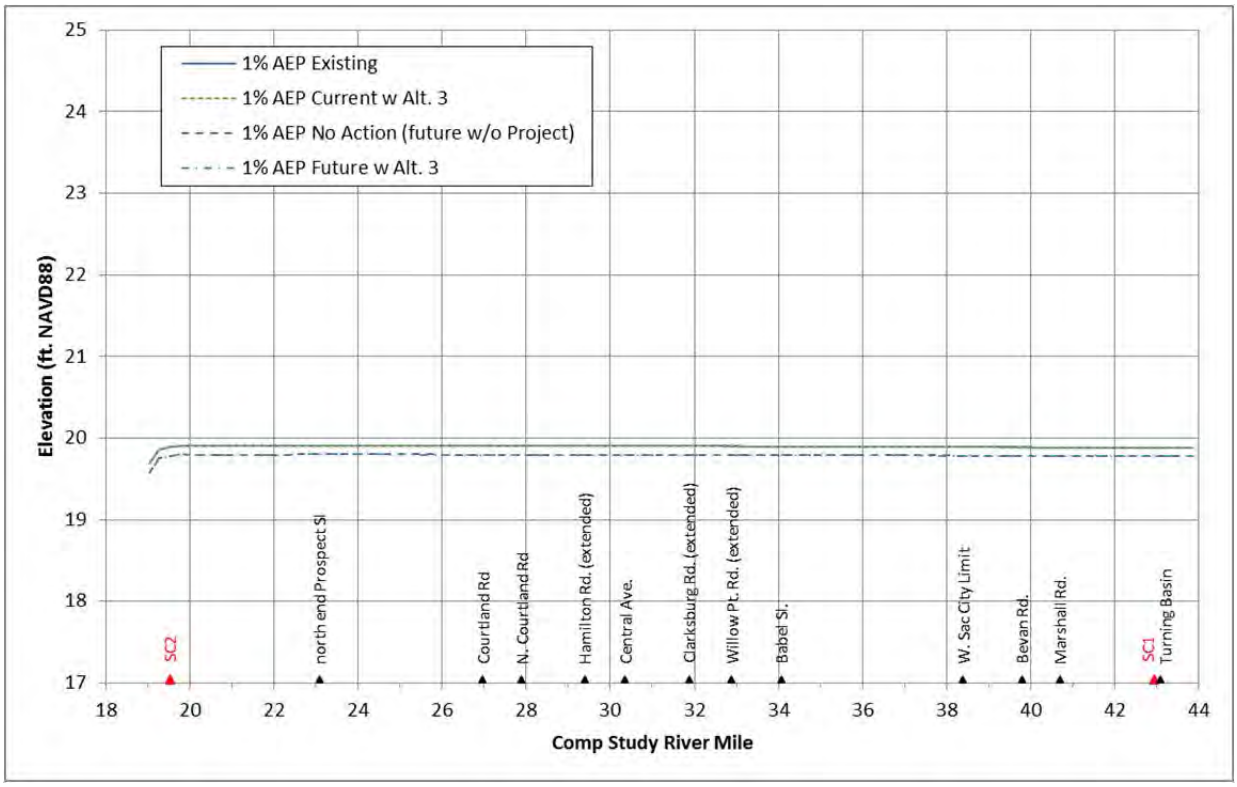


Figure 105. Maximum Water Surface Elevations; Deep Water Ship Channel; Alternative 3; 1% AEP

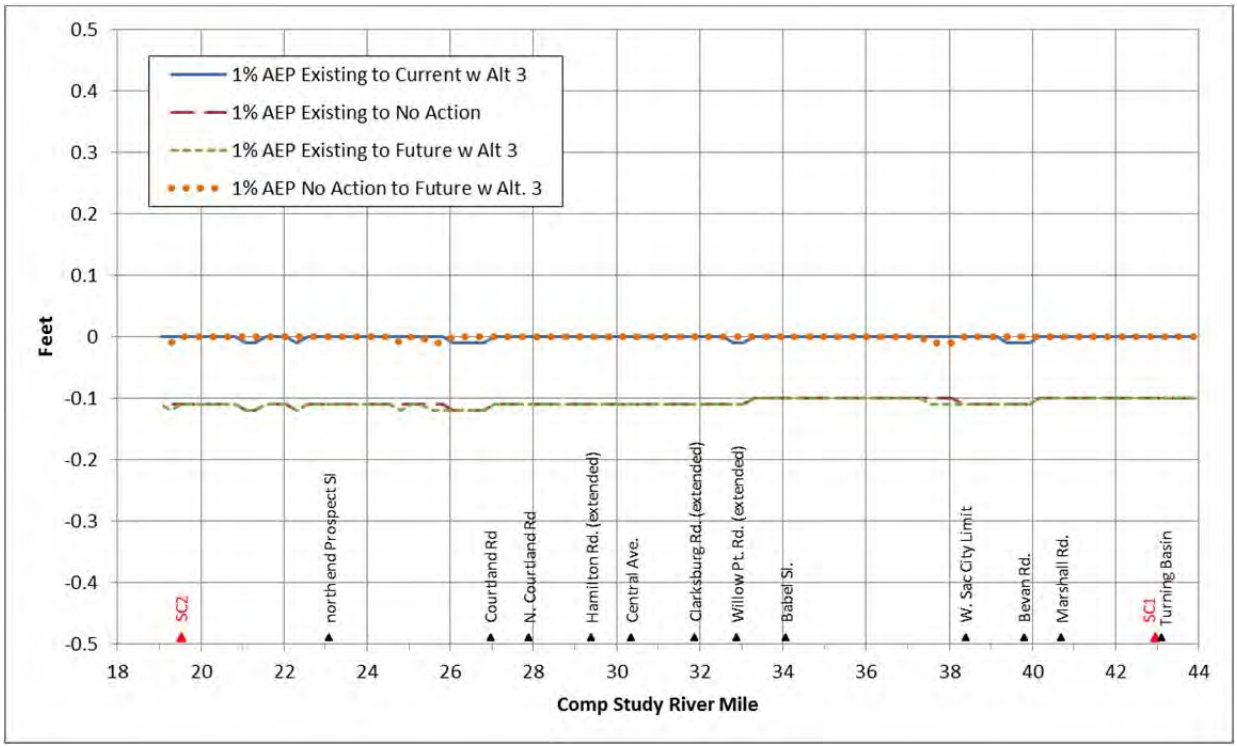


Figure 106. Maximum Water Surface Elevation Impacts; Deep Water Ship Channel; Alternative 3; 1% AEP

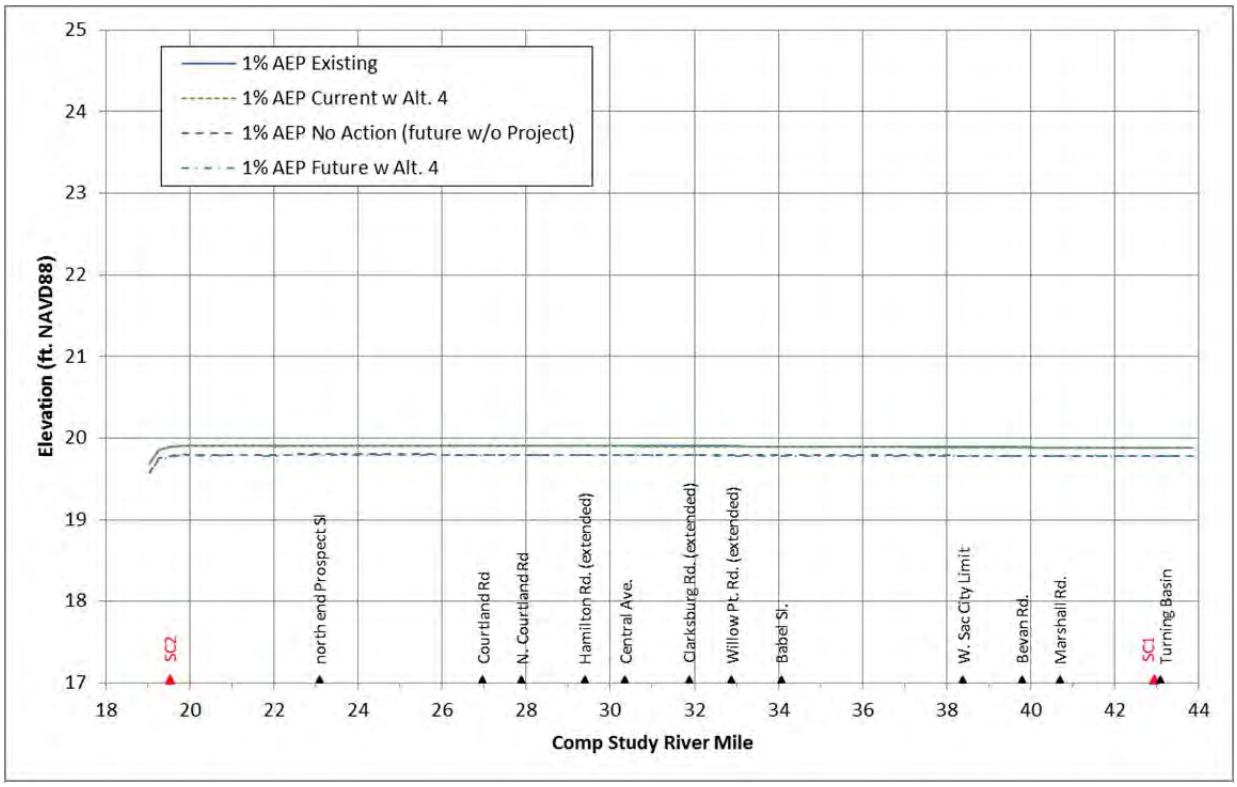


Figure 107. Maximum Water Surface Elevations; Deep Water Ship Channel; Alternative 4; 1% AEP

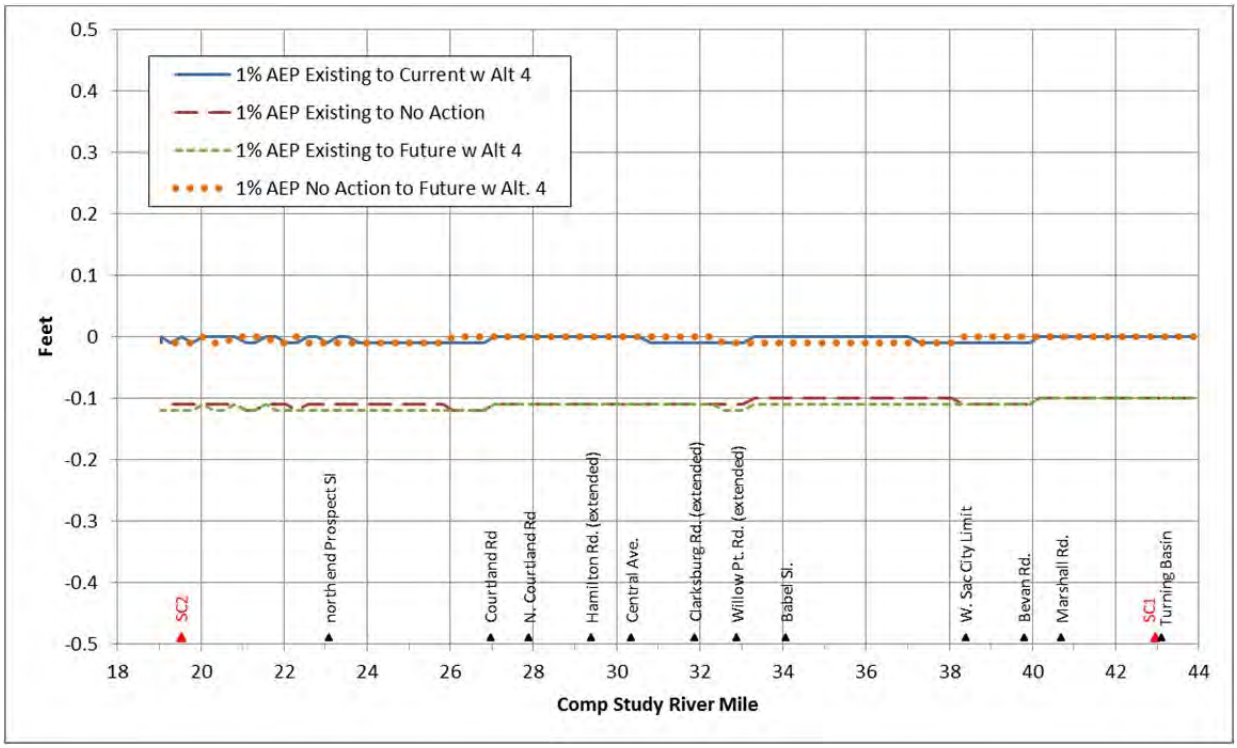


Figure 108. Maximum Water Surface Elevation Impacts; Deep Water Ship Channel; Alternative 4; 1% AEP

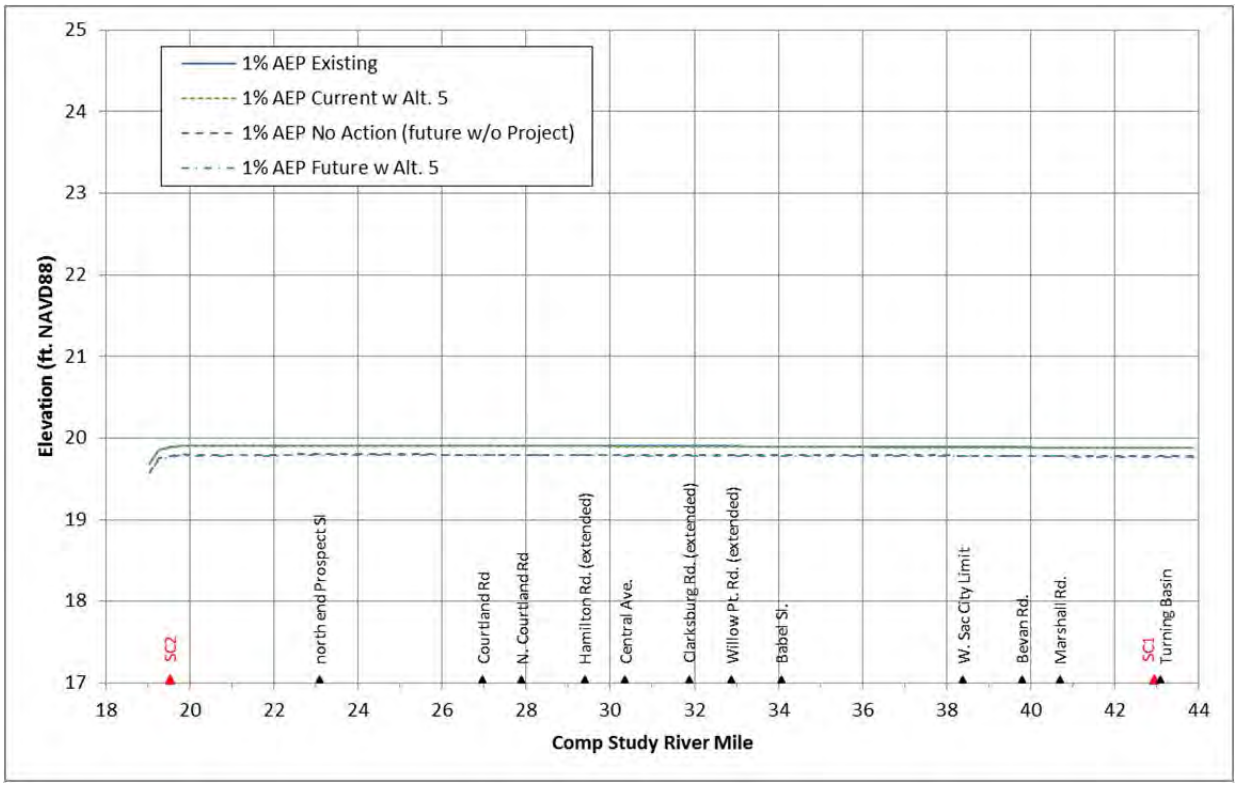


Figure 109. Maximum Water Surface Elevations; Deep Water Ship Channel; Alternative 5; 1% AEP

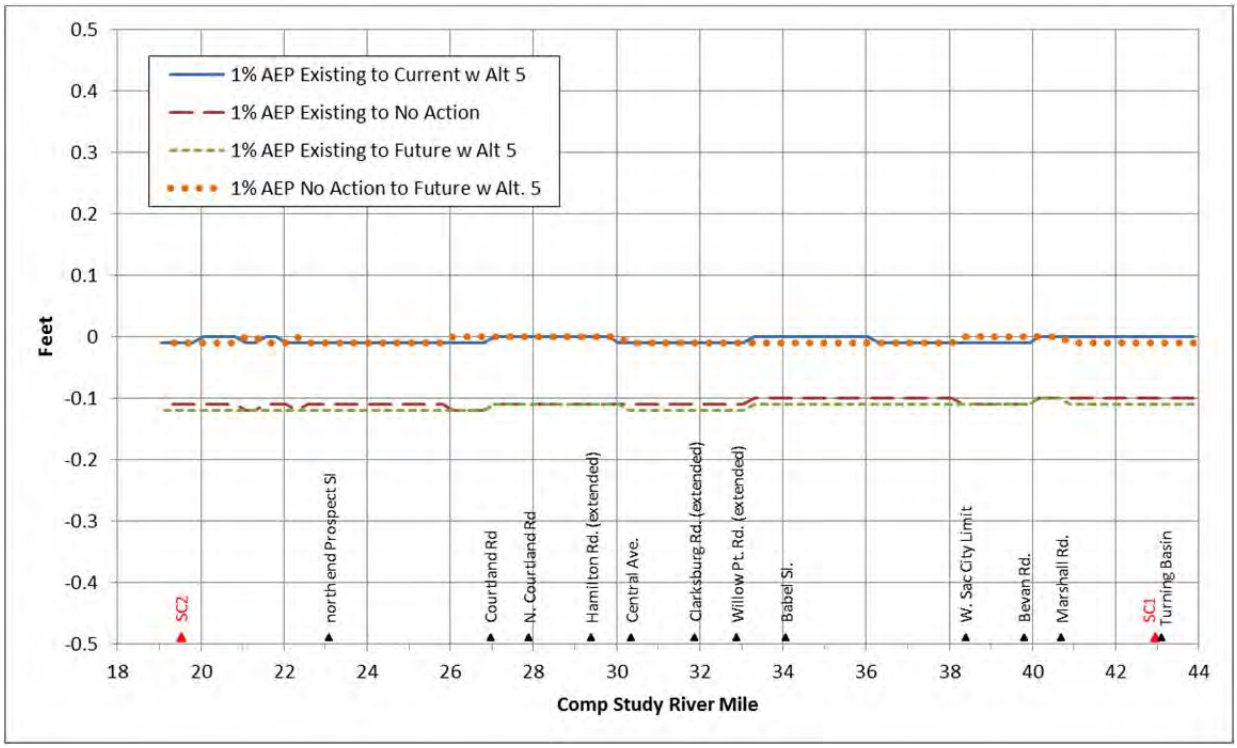


Figure 110. Maximum Water Surface Elevation Impacts; Deep Water Ship Channel; Alternative 5; 1% AEP

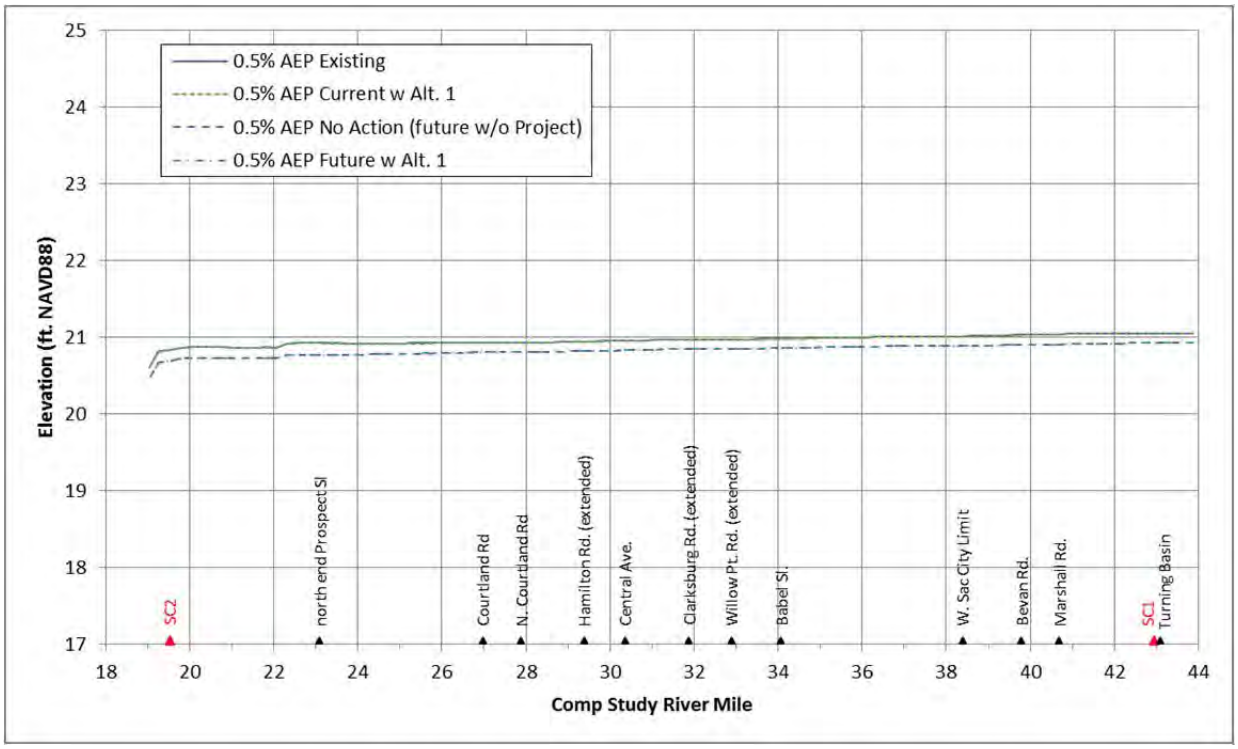


Figure 111. Maximum Water Surface Elevations; Deep Water Ship Channel; Alternative 1; 0.5% AEP

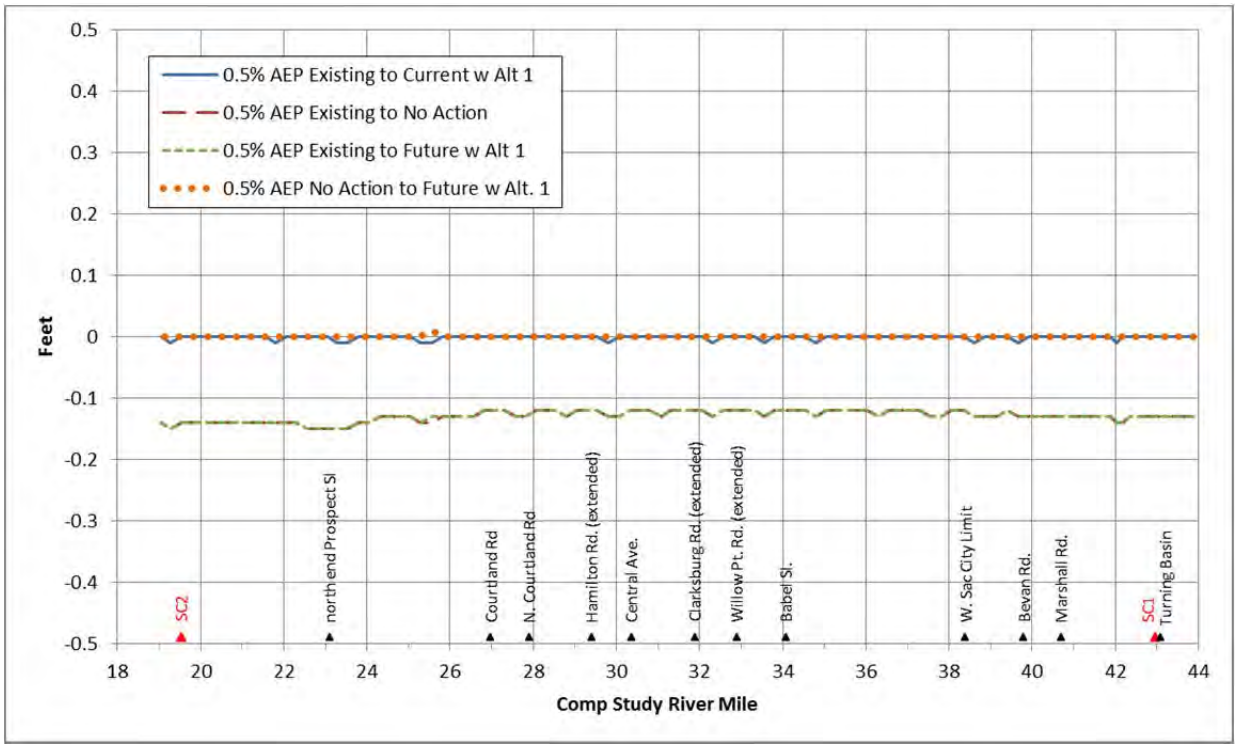


Figure 112. Maximum Water Surface Elevation Impacts; Deep Water Ship Channel; Alternative 1; 0.5% AEP

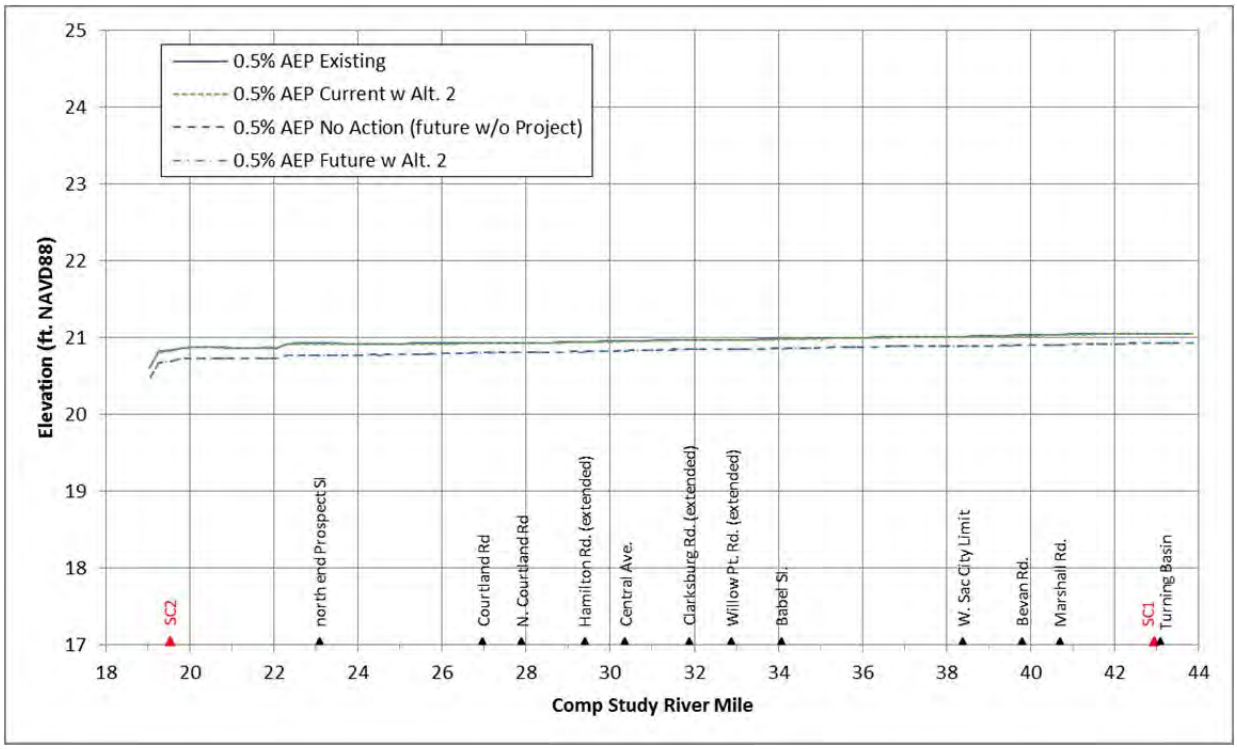


Figure 113. Maximum Water Surface Elevations; Deep Water Ship Channel; Alternative 2; 0.5% AEP

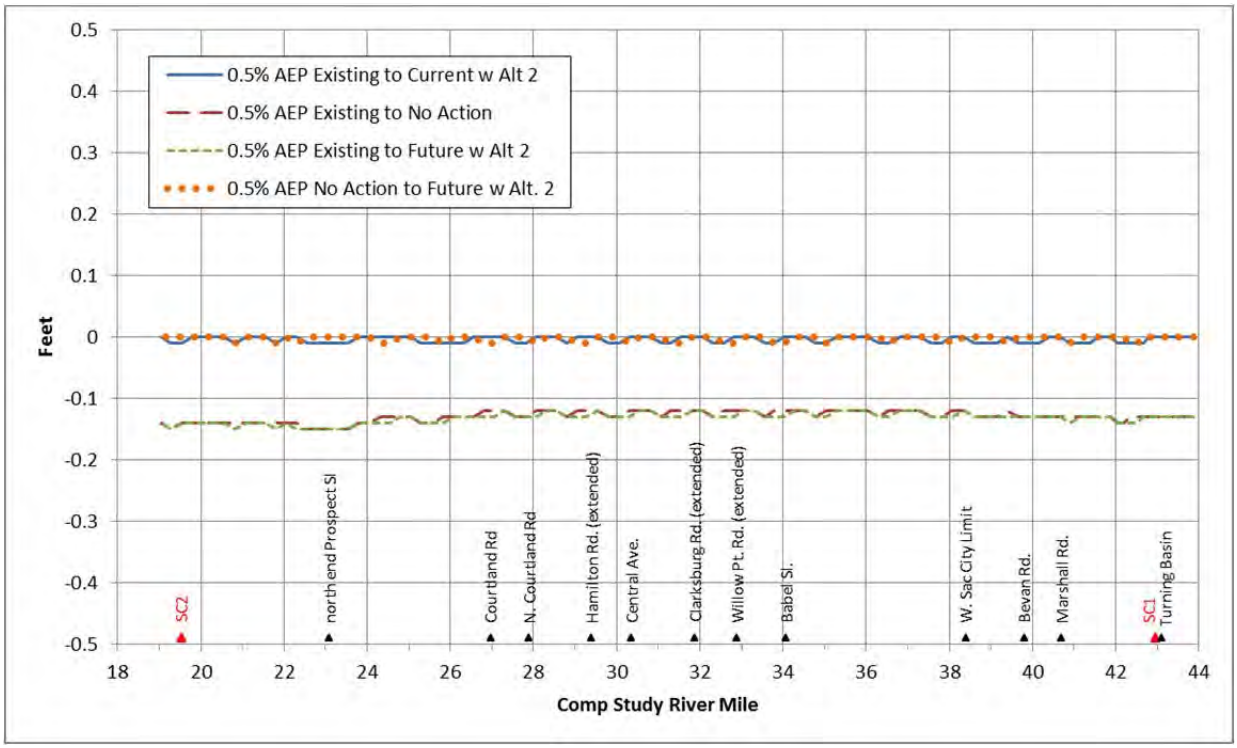


Figure 114. Maximum Water Surface Elevation Impacts; Deep Water Ship Channel; Alternative 2; 0.5% AEP

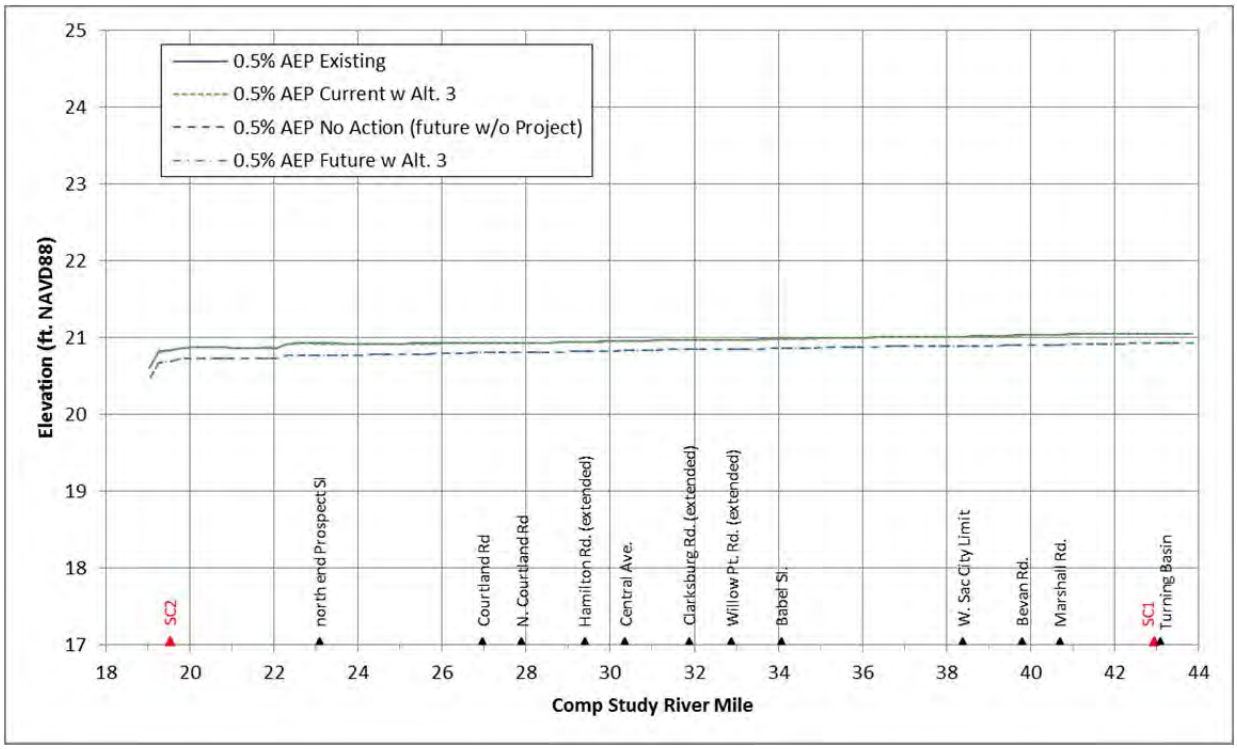


Figure 115. Maximum Water Surface Elevations; Deep Water Ship Channel; Alternative 3; 0.5% AEP

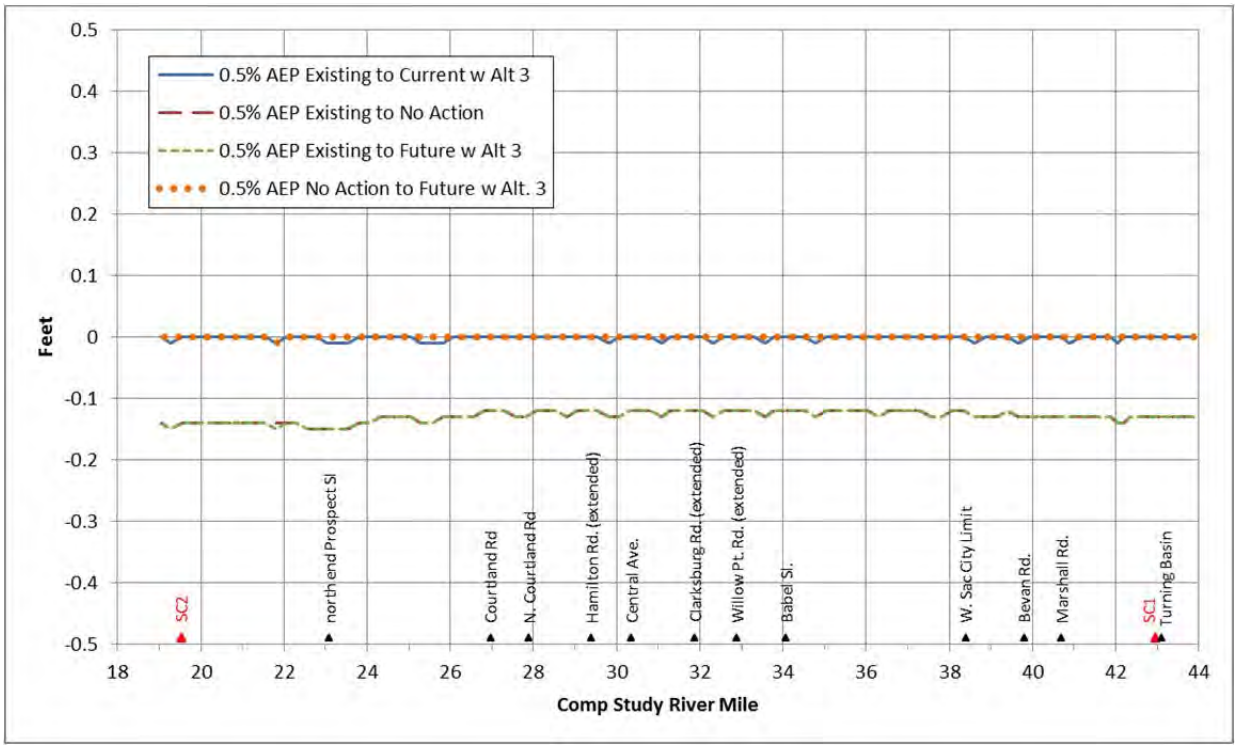


Figure 116. Maximum Water Surface Elevation Impacts; Deep Water Ship Channel; Alternative 3; 0.5% AEP

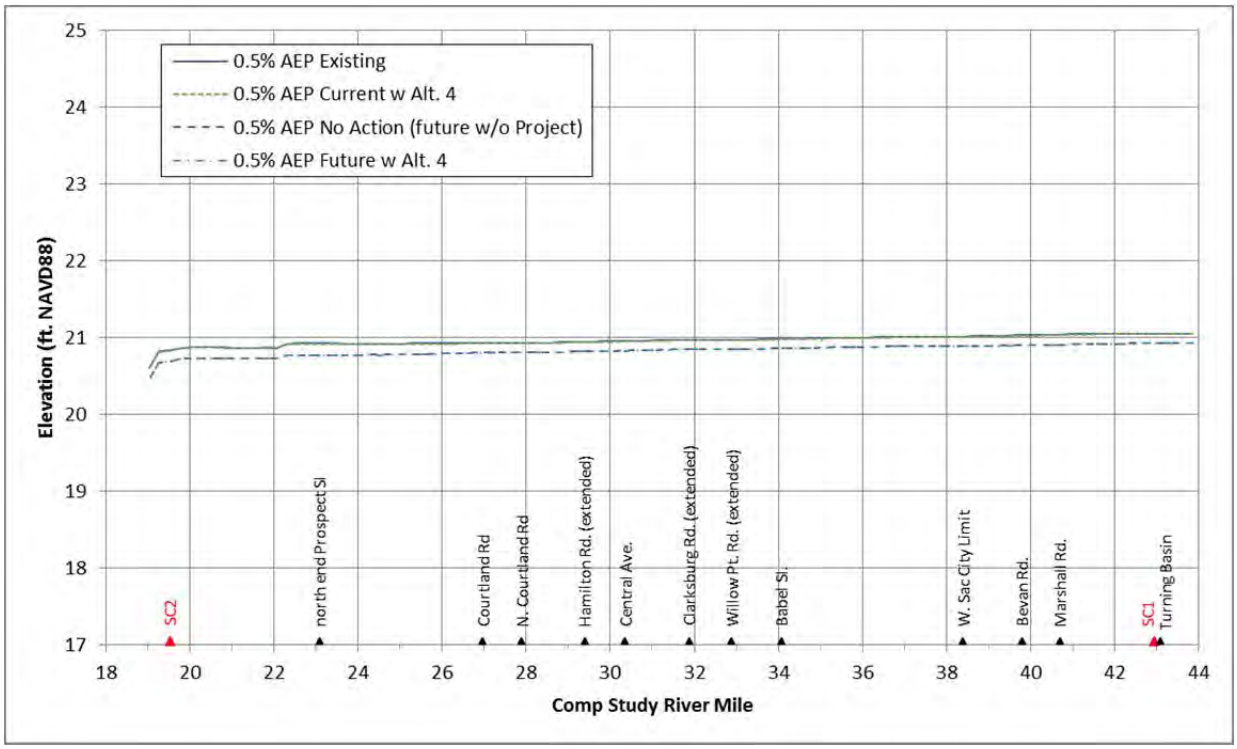


Figure 117. Maximum Water Surface Elevations; Deep Water Ship Channel; Alternative 4; 0.5% AEP

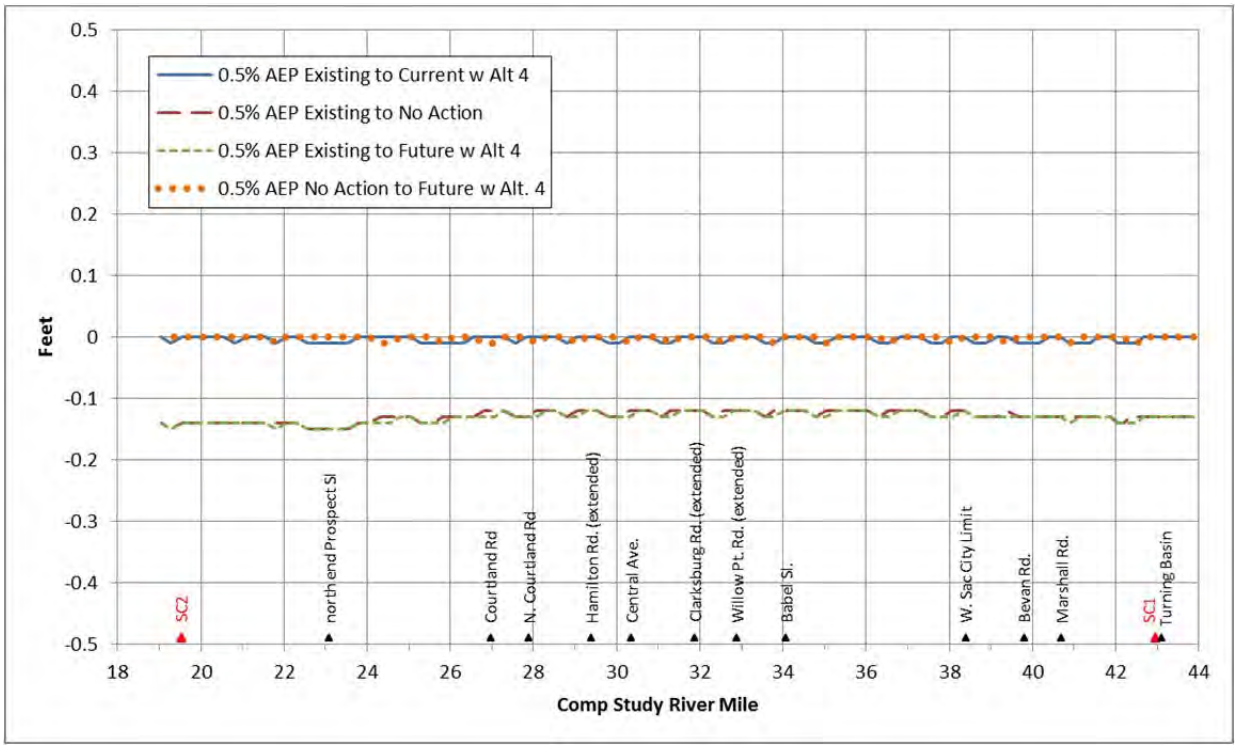


Figure 118. Maximum Water Surface Elevation Impacts; Deep Water Ship Channel; Alternative 4; 0.5% AEP

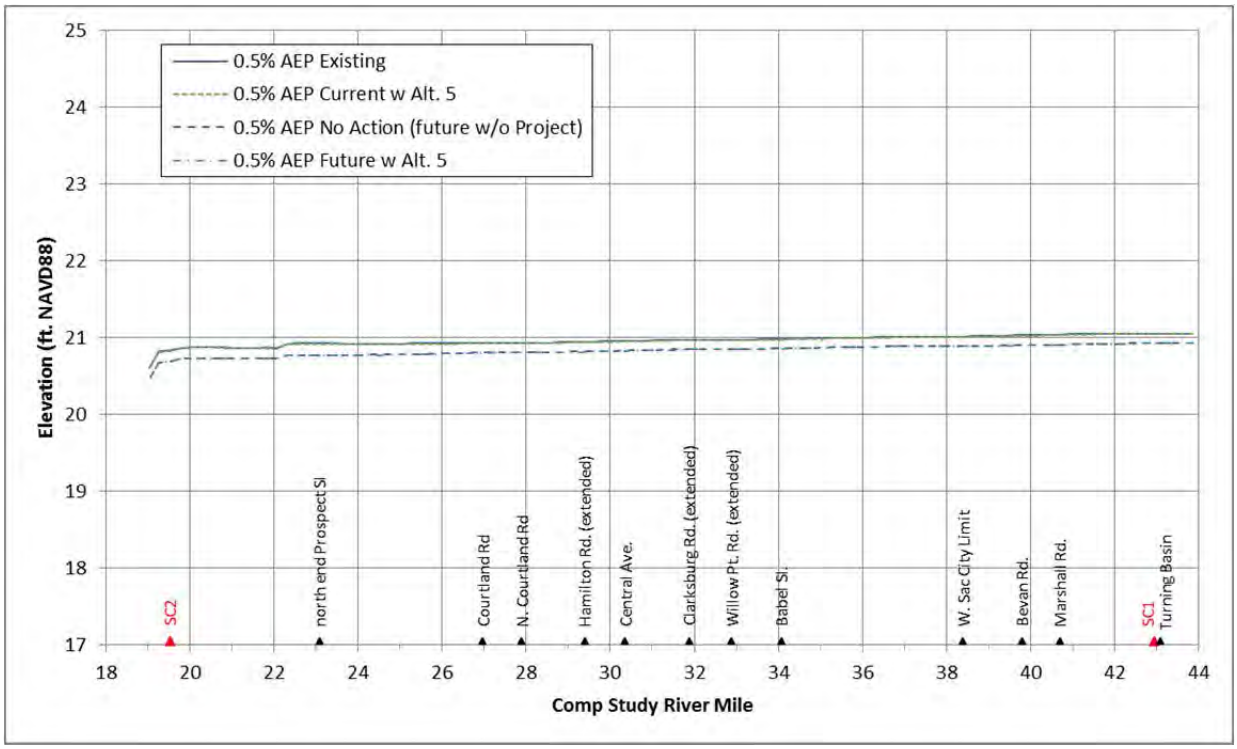


Figure 119. Maximum Water Surface Elevations; Deep Water Ship Channel; Alternative 5; 0.5% AEP

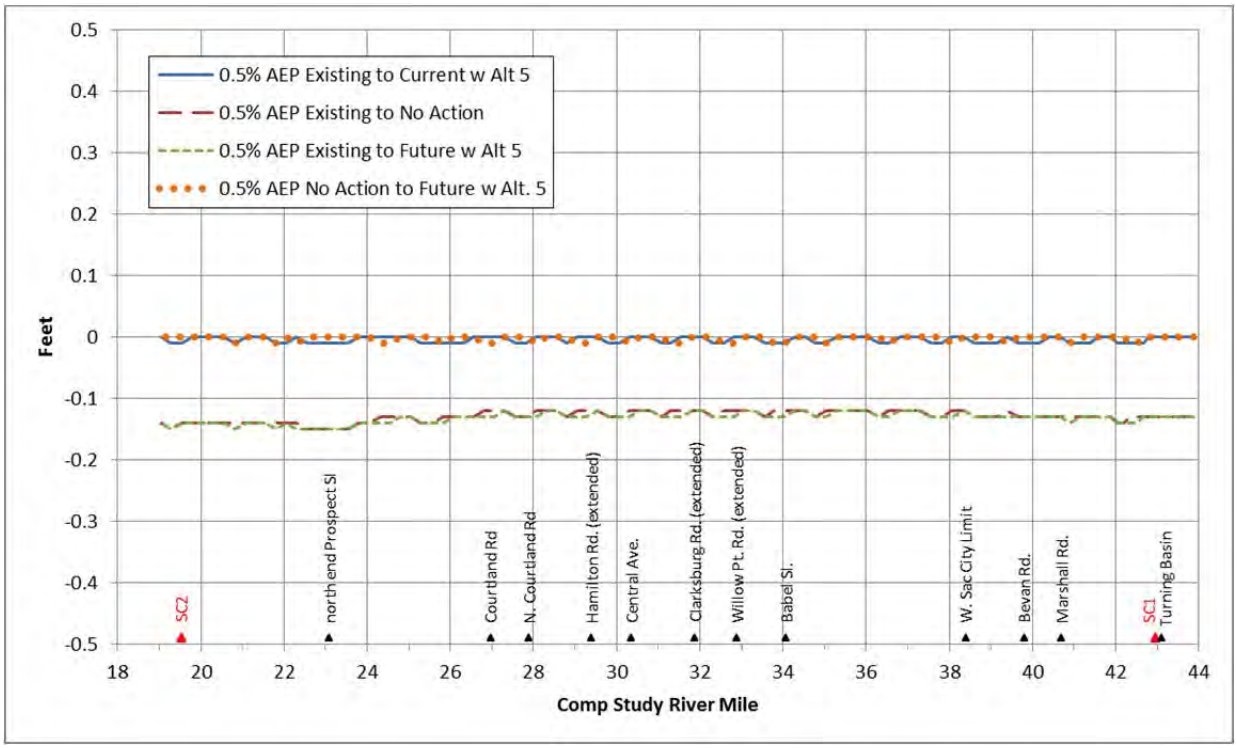


Figure 120. Maximum Water Surface Elevation Impacts; Deep Water Ship Channel; Alternative 5; 0.5% AEP

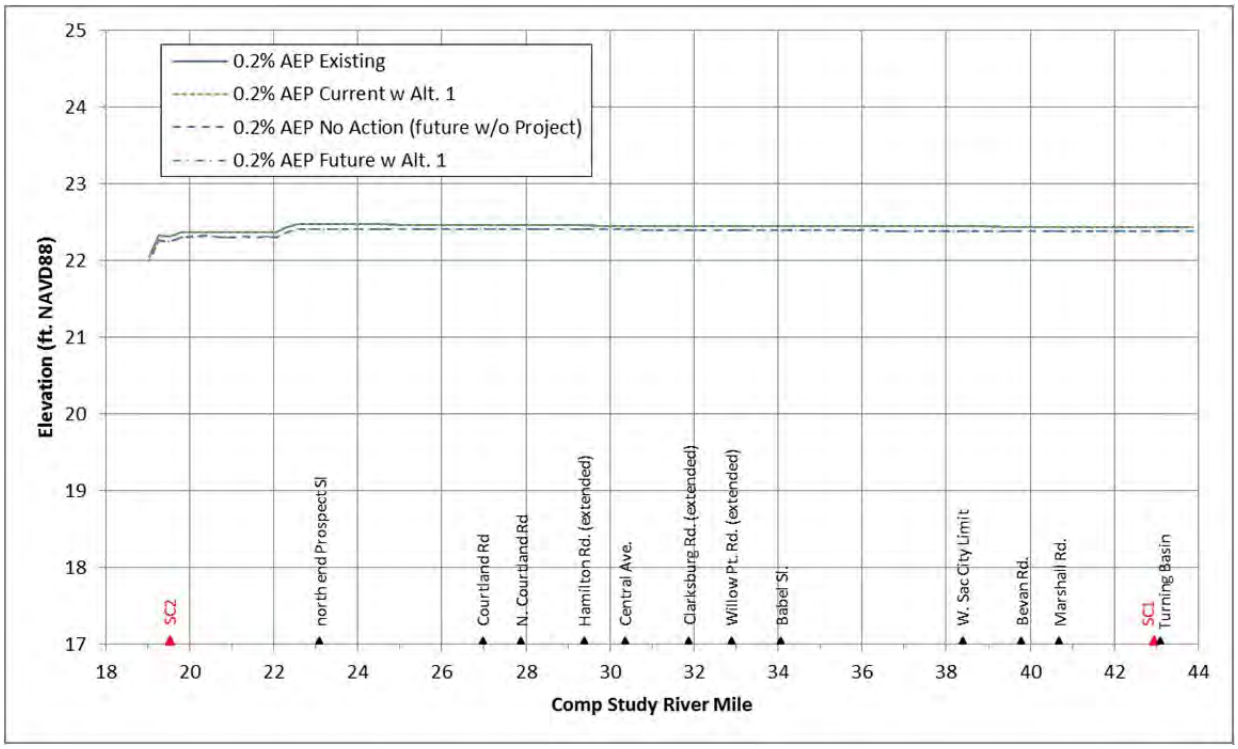


Figure 121. Maximum Water Surface Elevations; Deep Water Ship Channel; Alternative 1; 0.2% AEP

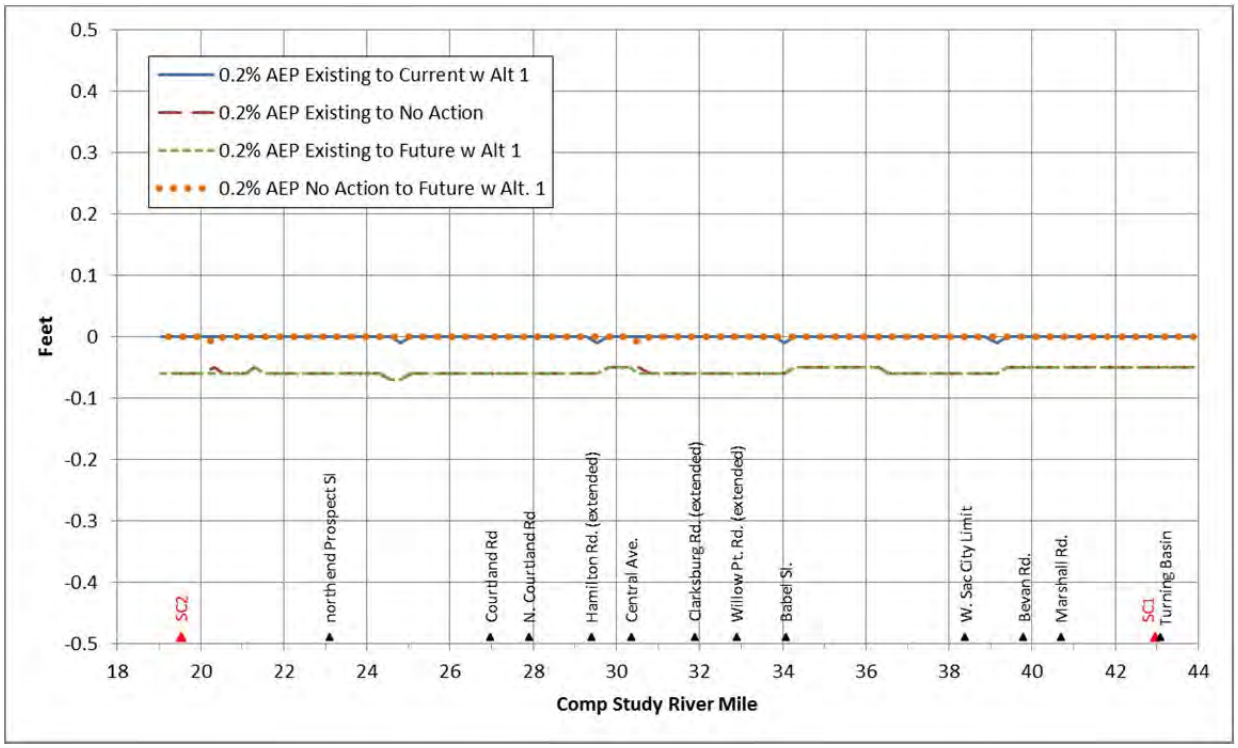


Figure 122. Maximum Water Surface Elevation Impacts; Deep Water Ship Channel; Alternative 1; 0.2% AEP

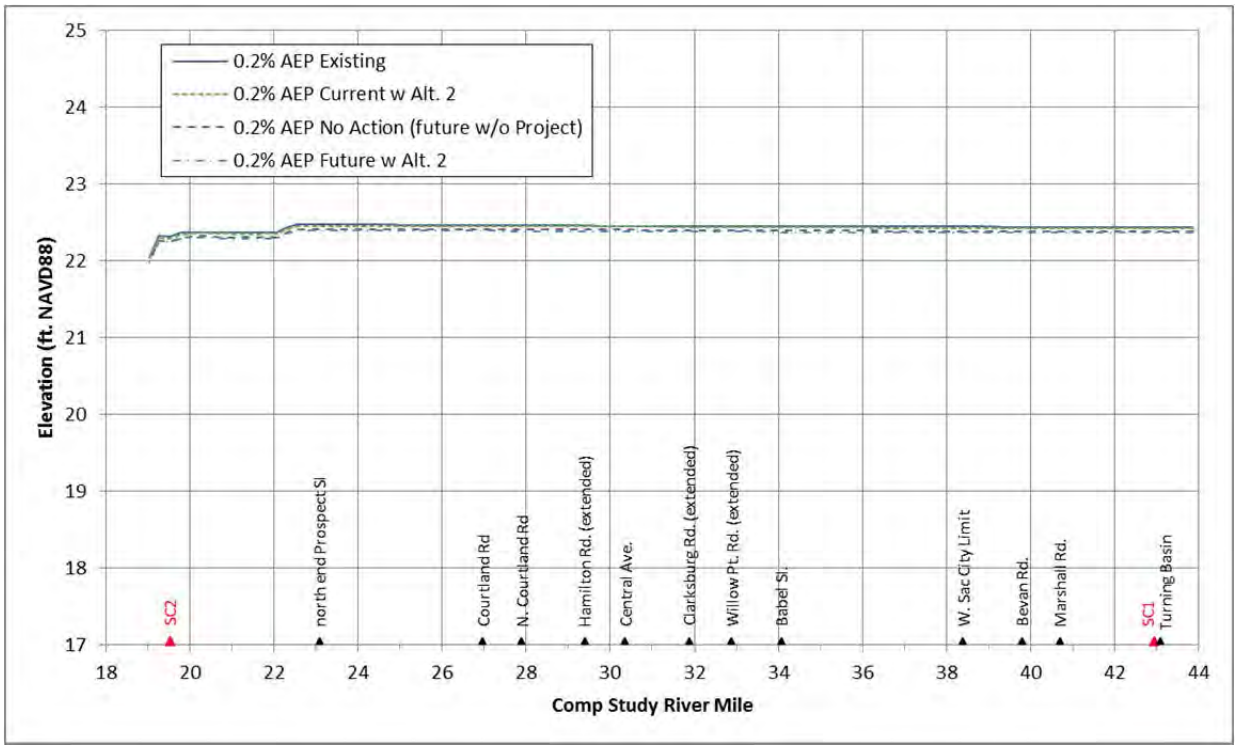


Figure 123. Maximum Water Surface Elevations; Deep Water Ship Channel; Alternative 2; 0.2% AEP

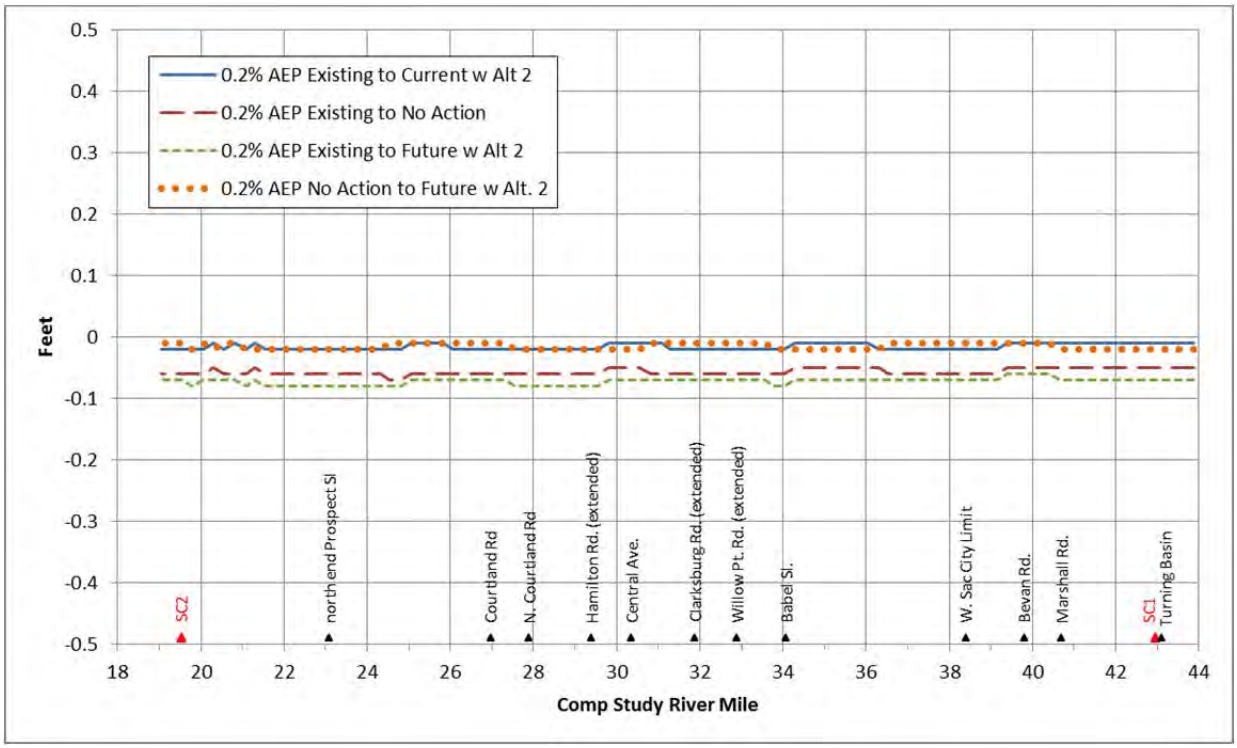


Figure 124. Maximum Water Surface Elevation Impacts; Deep Water Ship Channel; Alternative 2; 0.2% AEP

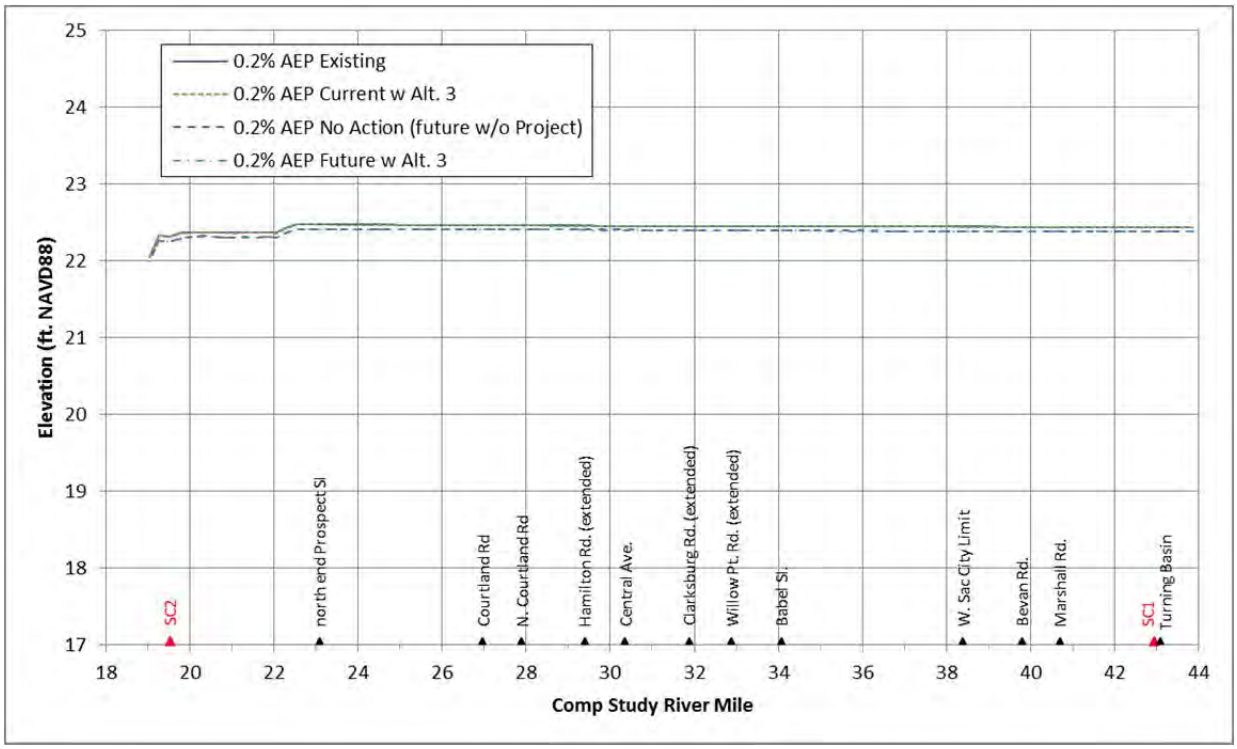


Figure 125. Maximum Water Surface Elevations; Deep Water Ship Channel; Alternative 3; 0.2% AEP

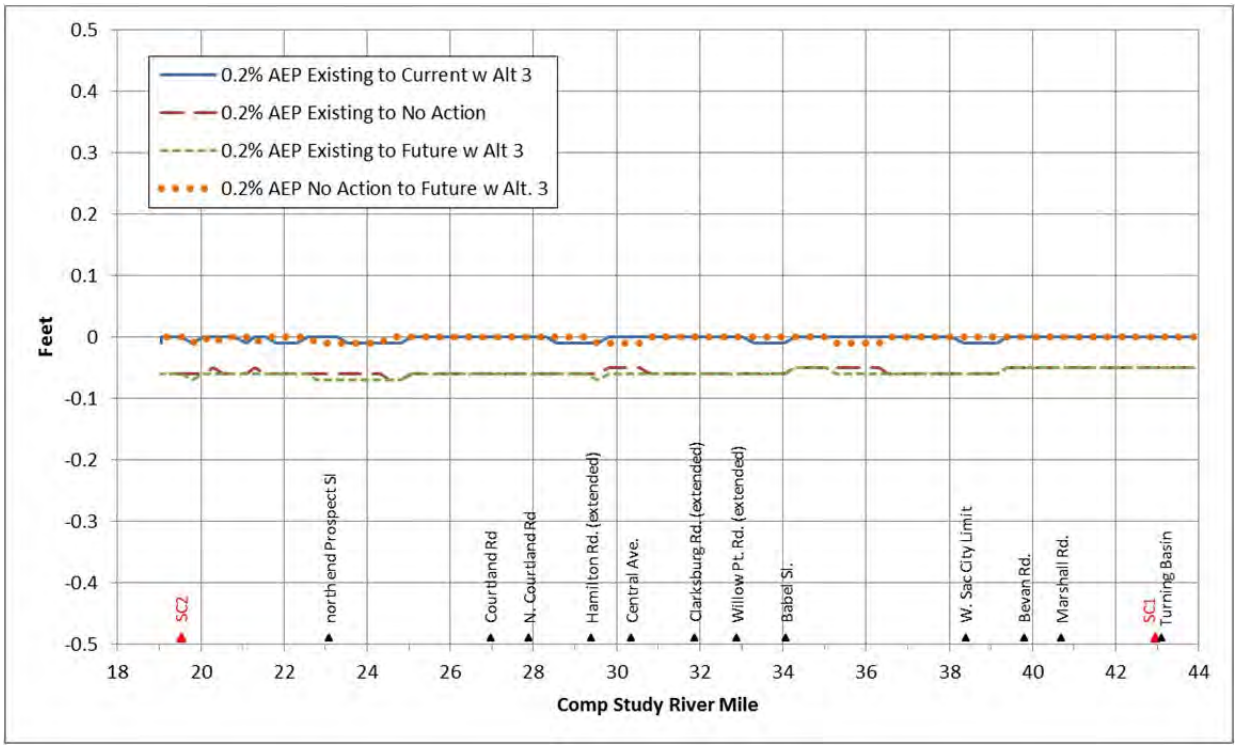


Figure 126. Maximum Water Surface Elevation Impacts; Deep Water Ship Channel; Alternative 3; 0.2% AEP

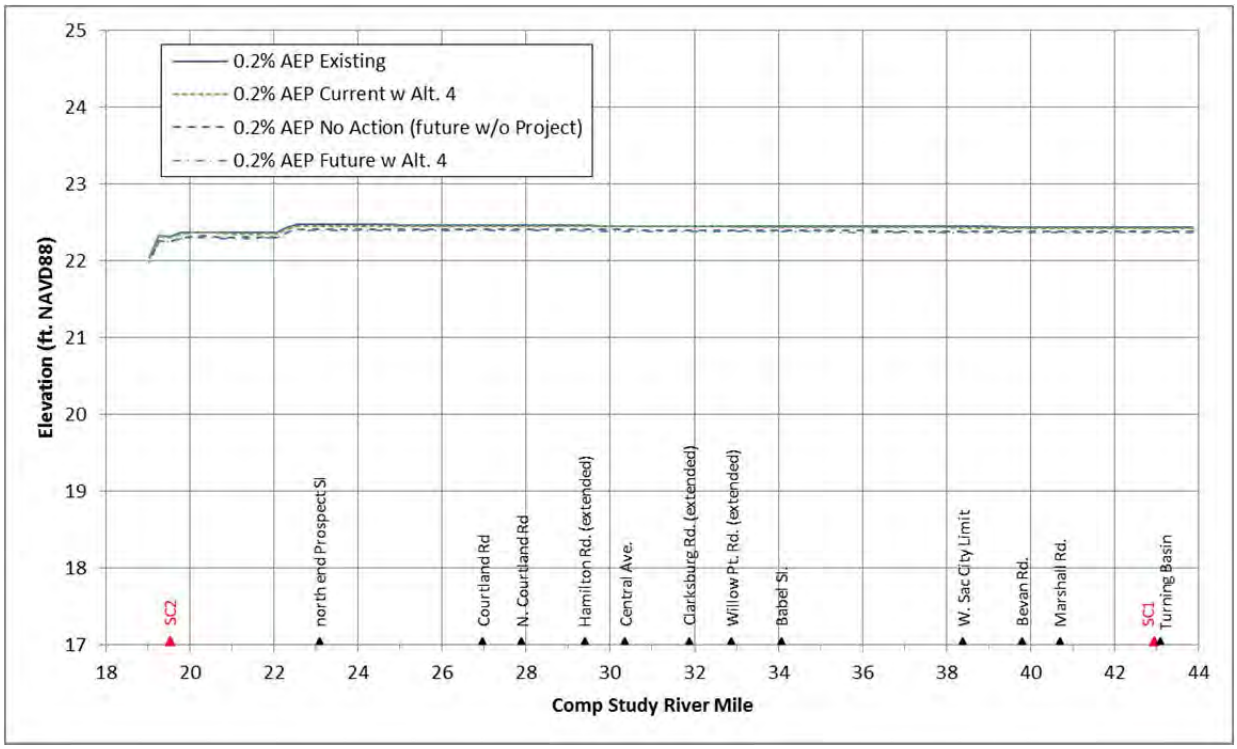


Figure 127. Maximum Water Surface Elevations; Deep Water Ship Channel; Alternative 4; 0.2% AEP

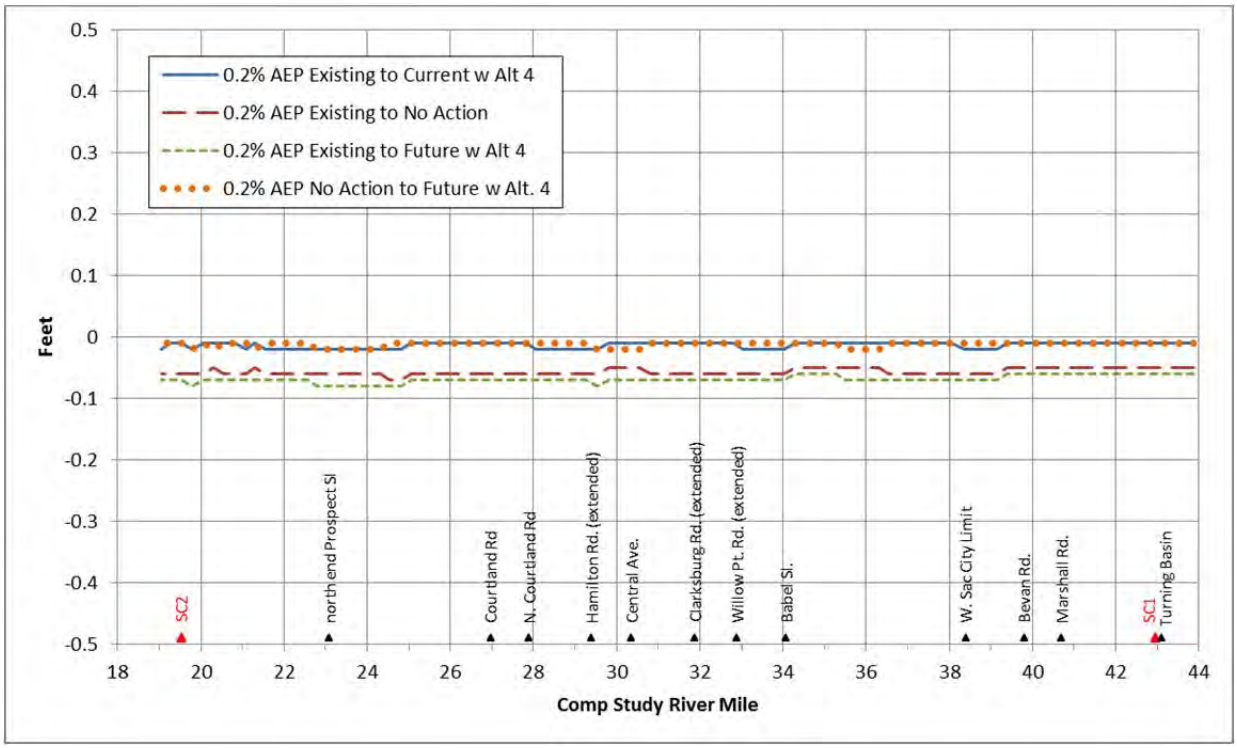


Figure 128. Maximum Water Surface Elevation Impacts; Deep Water Ship Channel; Alternative 4; 0.2% AEP

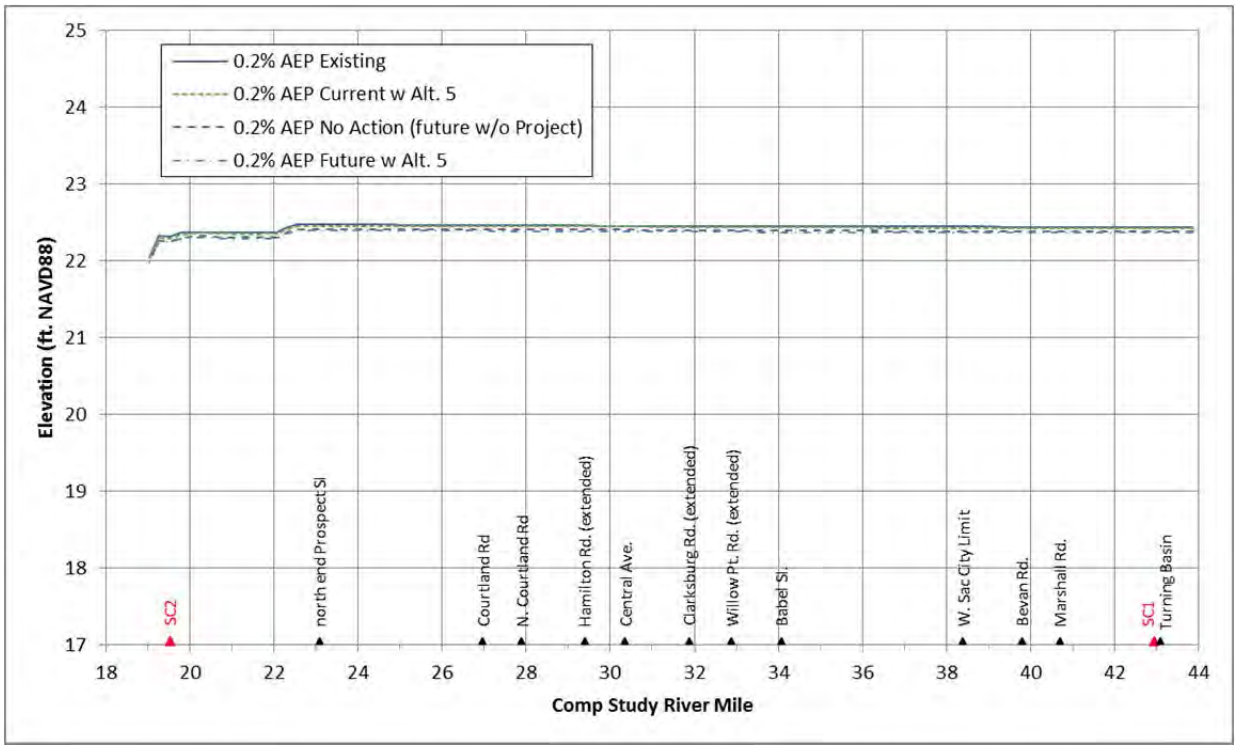


Figure 129. Maximum Water Surface Elevations; Deep Water Ship Channel; Alternative 5; 0.2% AEP

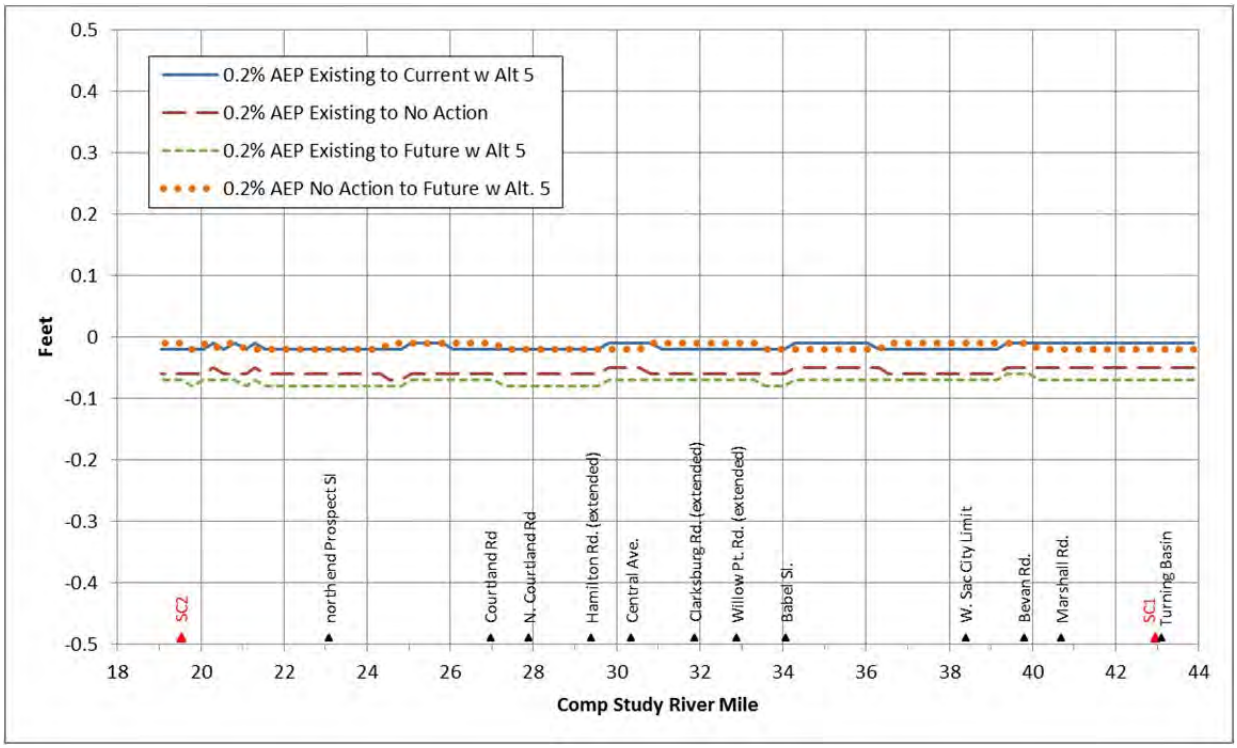


Figure 130. Maximum Water Surface Elevation Impacts; Deep Water Ship Channel; Alternative 5; 0.2% AEP

APPENDIX A

USACE Memorandum for Record for
Sacramento River Basin HEC-RAS Model Release 4

CESPK-ED-HD 4 June 2012

MEMORANDUM FOR RECORD

SUBJECT: Sacramento River Basin HEC-RAS Model Release 4 (NAVD'88 Version)

1. REFERENCES

a. Memorandum for Record, CESPK-ED-HD. Subject: Sacramento River Basin HEC-RAS Model Release 3, 1 February 2011.
b. Memorandum for Record, CESPK-ED-HD. Subject: Sacramento River Basin HEC-RAS Model Release 2, 13 December 2010.
c. Memorandum for Record, CESPK-ED-DH. Subject: Sacramento River Basin HEC-RAS Model Release, 24 March 2009.
d. Hydrologic Engineering Center, HEC-RAS River Analysis Program Version 4.0.0, March 2008.
e. Hydrologic Engineering Center, HEC-RAS User's Manual Version 4.0.0, March 2008.

2. PURPOSE. This memo documents a fourth release of the Sacramento Basin HEC-RAS model. Previous releases of the model (see References 1.b, 1.c) were based on the NGVD'29 vertical datum and the latest model geometry is based on NAVD'88 vertical datum. The release of this model only includes runs for the synthetic hydrology (0.5, 0.1 0.04, 0.02, 0.01, 0.005, 0.002 annual exceedance probability) and does not include detailed documentation. Documentation of model construct and results will be available in the future.

The intent with the release of this model at this time is to allow for interested parties to make comments on the model construct and view results that were already handed off to the American River Common Features Project Delivery Team for use in their alternatives analysis. Along with this memo it will also be available for interested parties to review and provide comment on. This updated model has yet to undergo agency technical review (ATR) completed by another USACE district and this is planned to take place in the future. Based on these reviews, the USACE will generate a final model that will be released to any interested parties upon request.

The USACE makes no warranty regarding use of this model. The intent of this model release is to allow interested parties the opportunity to review the model and provide comment as a means to improve the model.

3. MODEL DEVELOPMENT. An extensive amount of effort was expended to convert the model from NGVD'29 to NAVD'88 vertical datum. Due to survey control stability issues in the topographic data collected by the USACE for the Comprehensive Study and the Sacramento River Bank Protection Project an appropriate conversion factor had to be determined to convert the data from NGVD'29 to NAVD'88. Model geometry in the HEC-RAS model was based upon this topographic data and therefore also had to be adjusted accordingly. In addition to the conversion of the model geometry, stream gage data and high water marks were also converted to NAVD'88. In some cases this required surveys of existing gages. Documentation on

CESPK-ED-HD 4 June 2012

MEMORANDUM FOR RECORD

SUBJECT: Sacramento River Basin HEC-RAS Model Release 4 (NAVD'88 Version)

conversion of the topographic data, stream gage data, and highwater mark data is forthcoming and will be provided in the near future.

The extents of the HEC-RAS model are the same as in previous releases of the model. The model was primarily calibrated using the 2006 flood event because it was a recent large event without levee failure. The 1997 event was also used during calibration. However, levee failures during the event created significant flow uncertainty in several reaches. Therefore, the 1997 event primarily served as model validation. The model geometry for the 2006 event is slightly different than the model geometry for the 1997 event. A pump station on the Natomas East Main Drain Canal (NEMDC) was added to the 2006 model geometry to reflect the addition of that pump station.

The geometry now includes updates to the system including the recently constructed setbacks on the Bear and Feather Rivers. Model runs were completed using HEC-RAS version 4.0.

4. SENSITIVITY ANALYSES. USACE recognizes some unresolved issues with the current state of the model and intends to conduct sensitivity analyses to gage how critical these issues are. Those include the sensitivity to higher or lower roughness values, the sensitivity to local inflows, and the sensitivity to flow splits at diversion weirs, in particular Tisdale Weir and the Fremont Weir. Any changes resulting from these analyses will be incorporated in the next release of the model.

5. For questions or comments on the model contact Ethan Thompson, P.E., (916) 557-7142, ethan.a.thompson@usace.army.mil or Jesse Schlunegger, P.E., (916) 557-6777, jesse.j.schlunegger@usace.army.mil.

Lea Adams, P.E.
Chief, Hydraulic Design Section
Sacramento District
U.S. Army Corps of Engineers

APPENDIX B

Setback Levee Cross-Section Plots

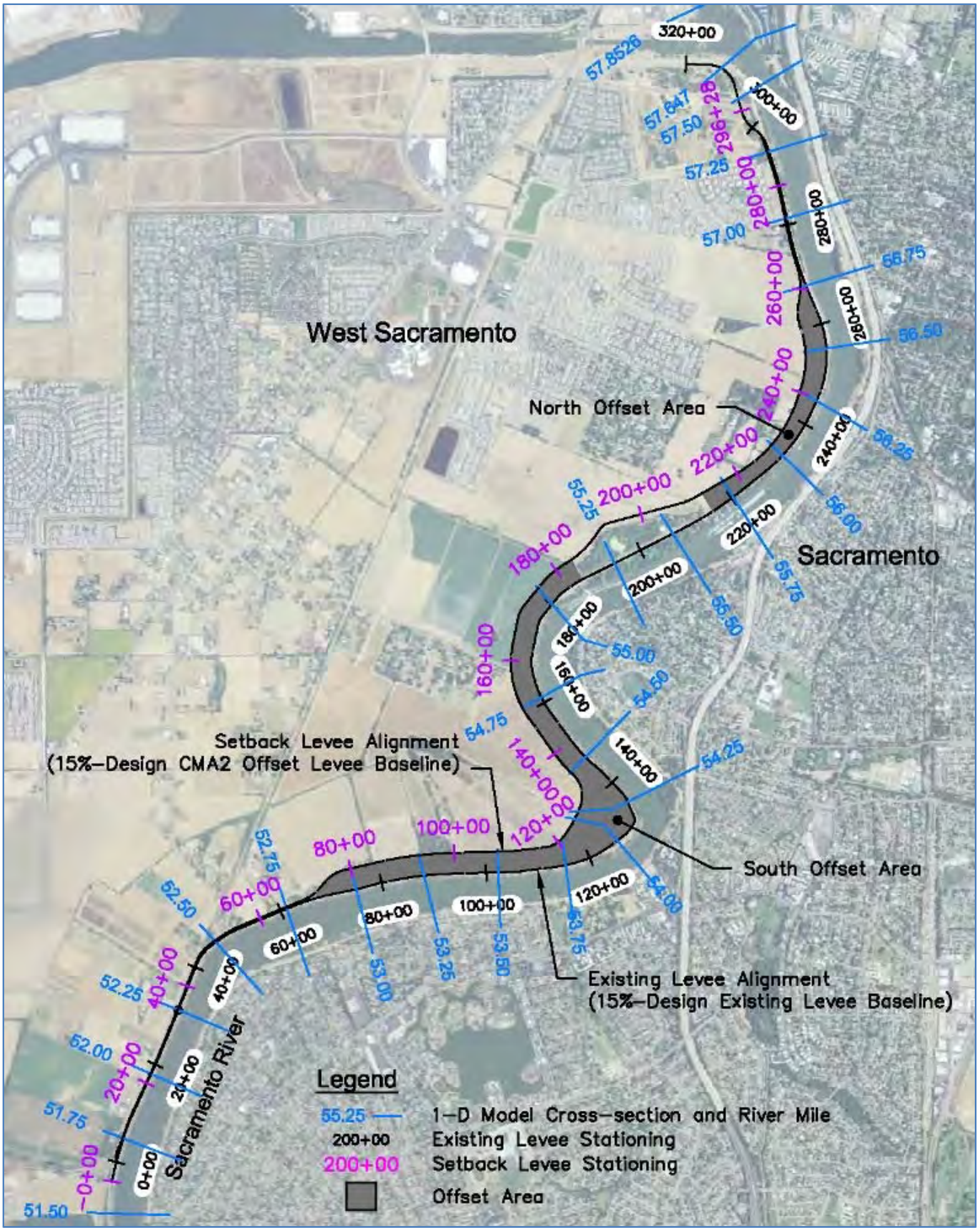


Figure B-1. Cross-section Locations

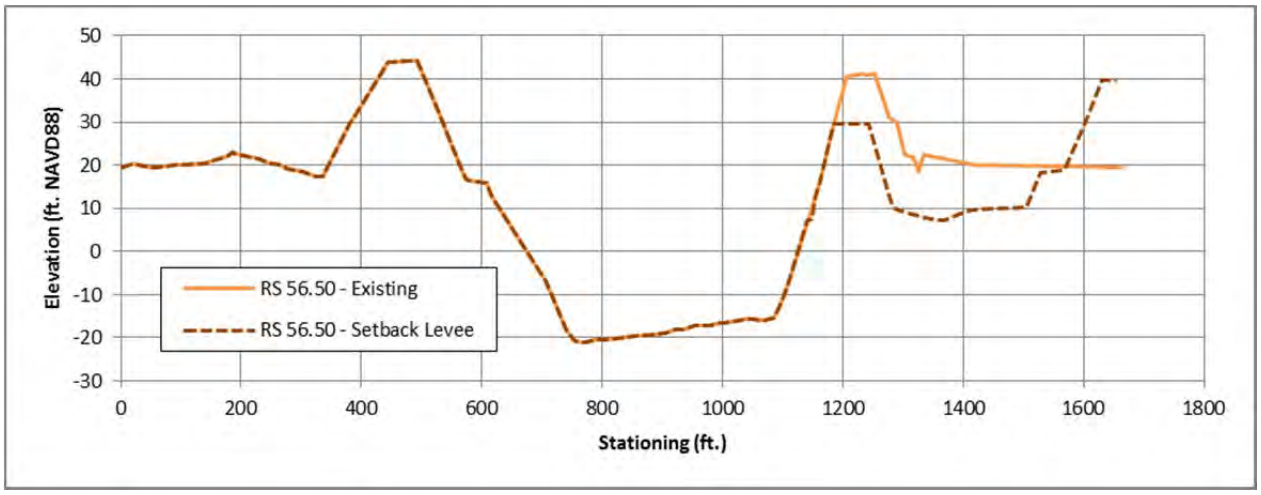


Figure B-2. Cross-section 56.50 (looking downstream)

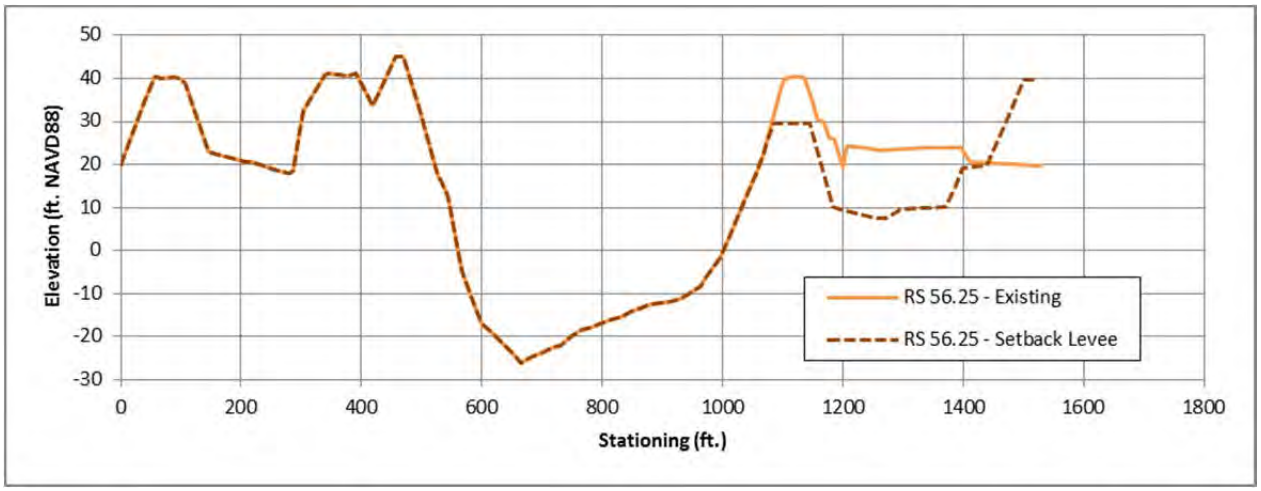


Figure B-3. Cross-section 56.25 (looking downstream)

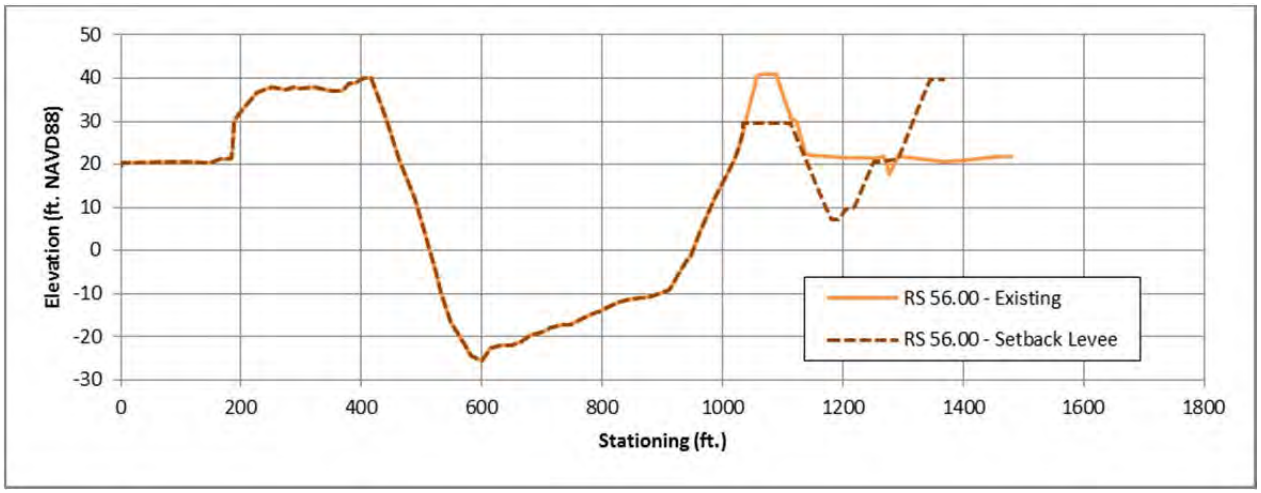


Figure B-4. Cross-section 56.00 (looking downstream)

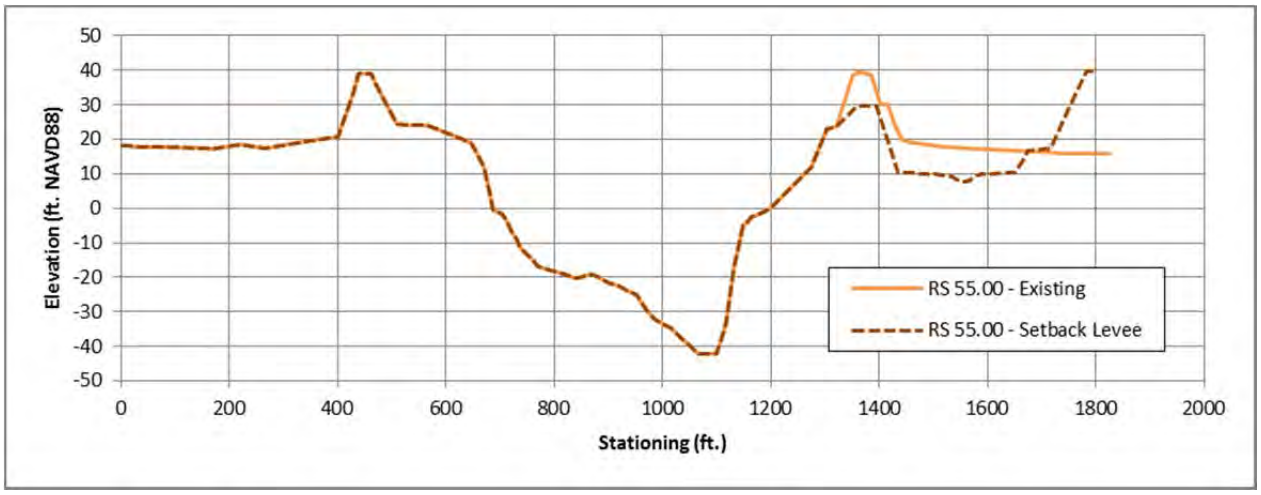


Figure B-5. Cross-section 55.00 (looking downstream)

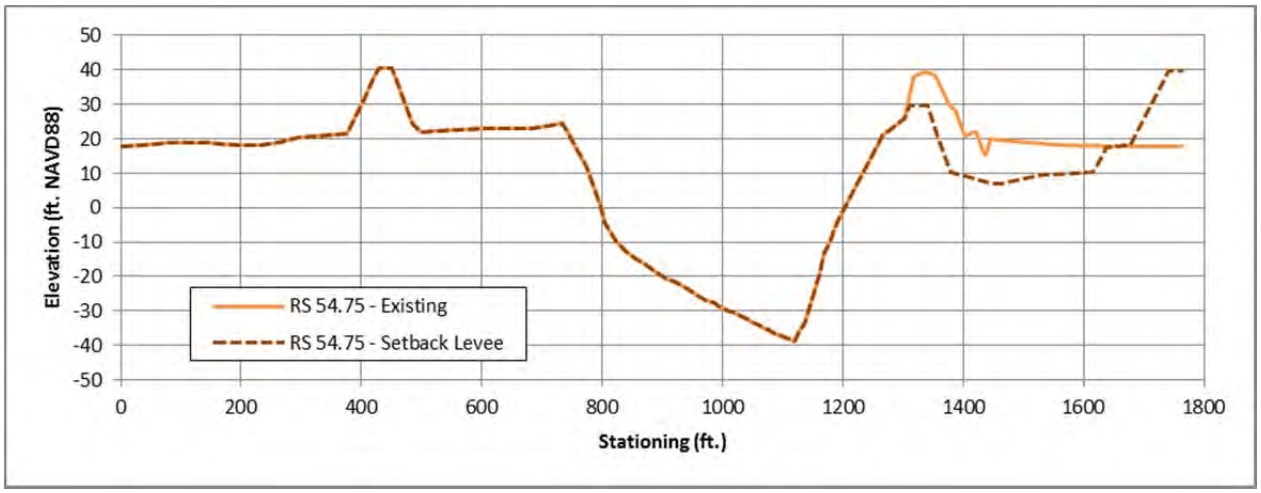


Figure B-6. Cross-section 54.75 (looking downstream)

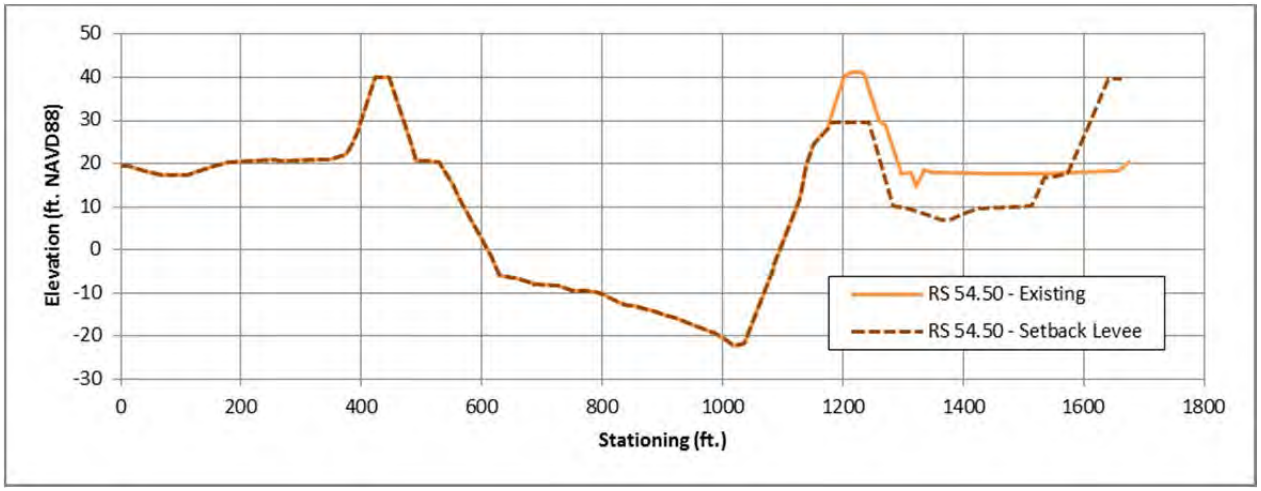


Figure B-7. Cross-section 54.50 (looking downstream)

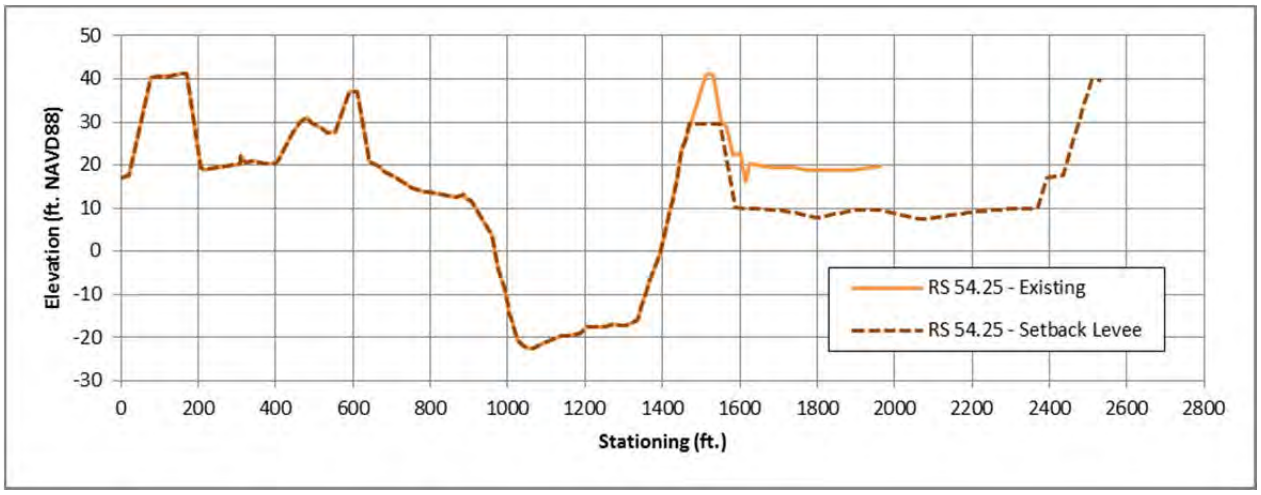


Figure B-8. Cross-section 54.25 (looking downstream)

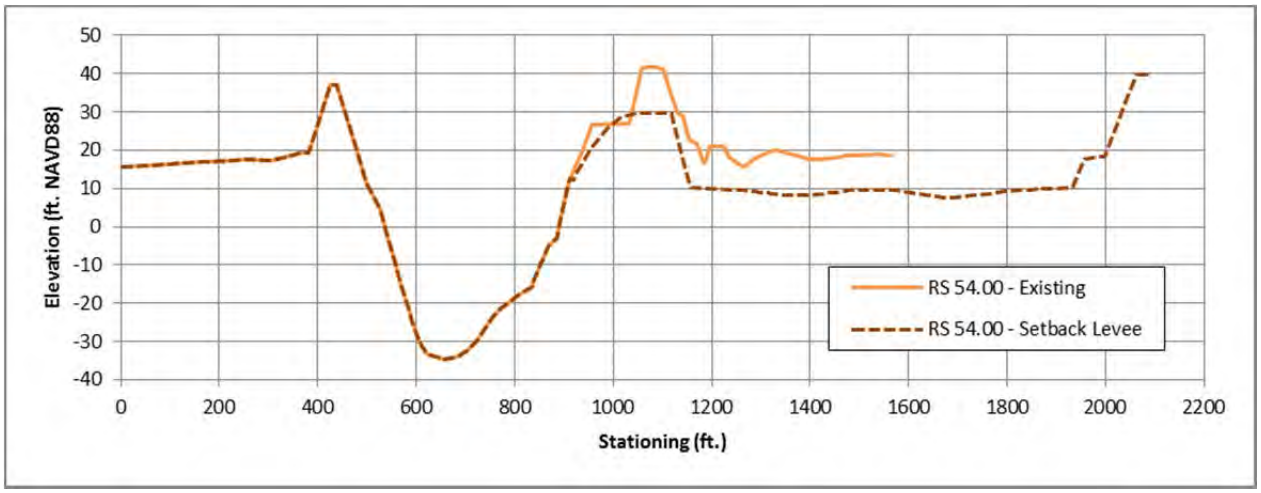


Figure B-9. Cross-section 54.00 (looking downstream)

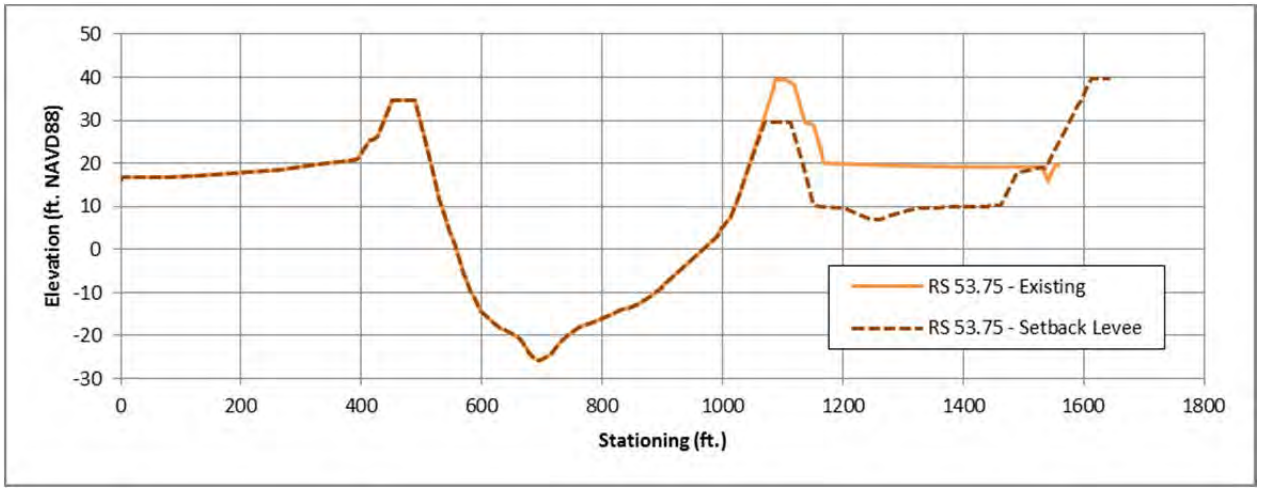


Figure B-10. Cross-section 53.75 (looking downstream)

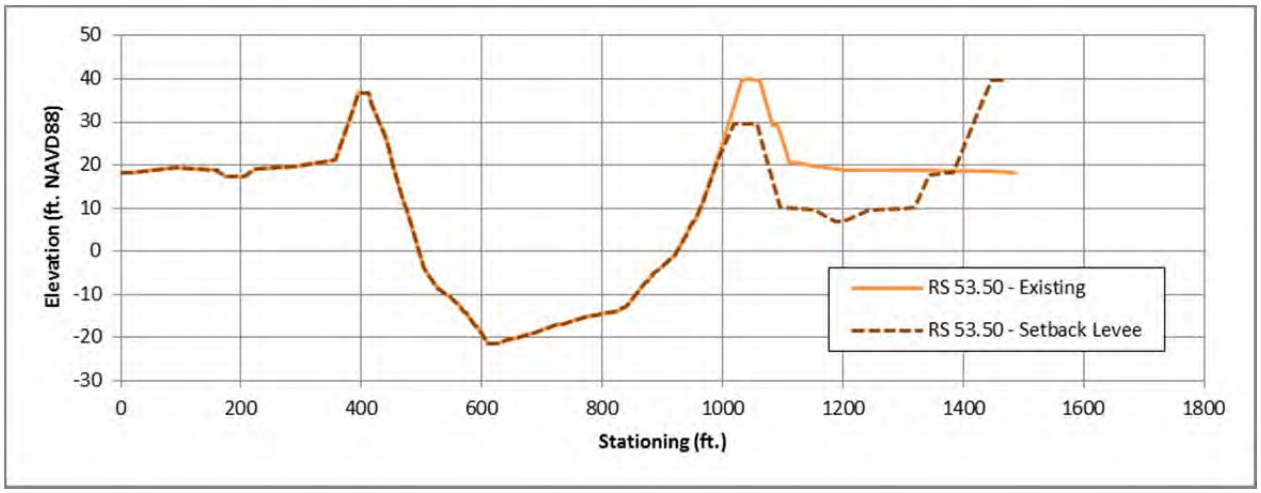


Figure B-11. Cross-section 53.50 (looking downstream)

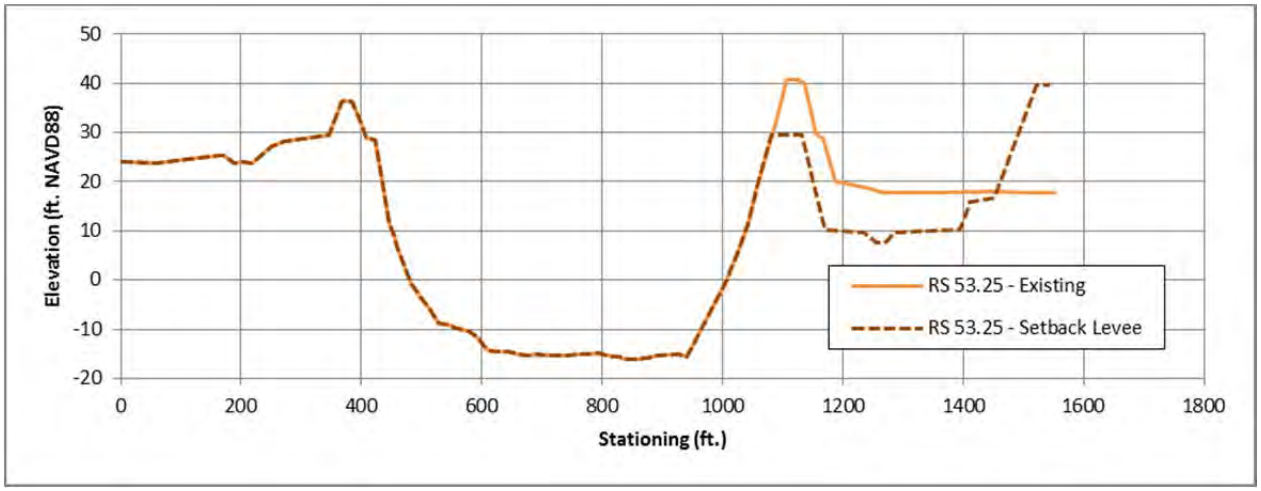


Exhibit B-12. Cross-section 53.25 (looking downstream)

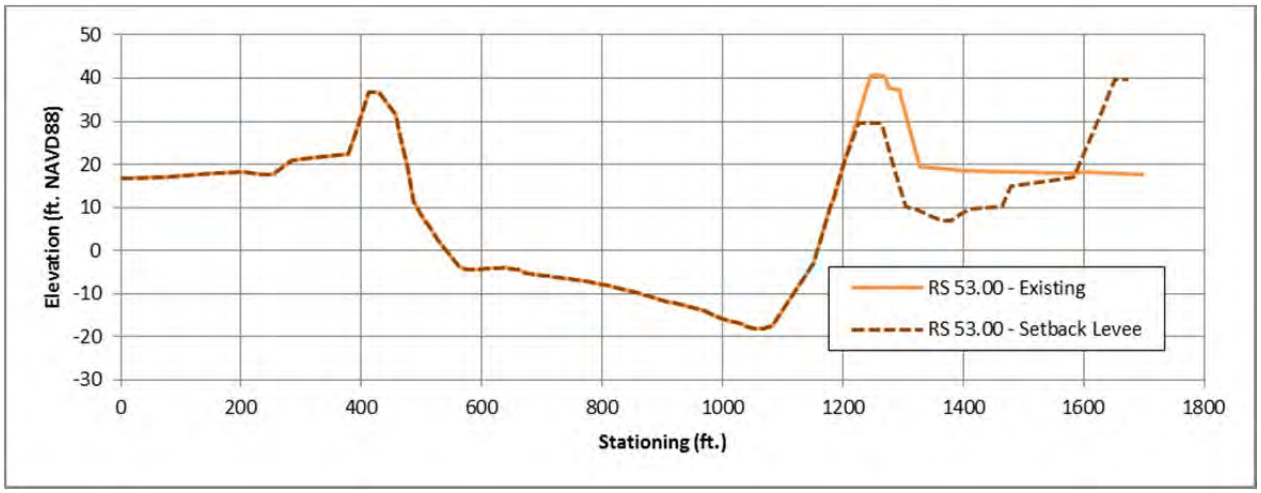


Exhibit B-13. Cross-section 53.00 (looking downstream)

APPENDIX C

Slope Flattening Cross-Section Plots

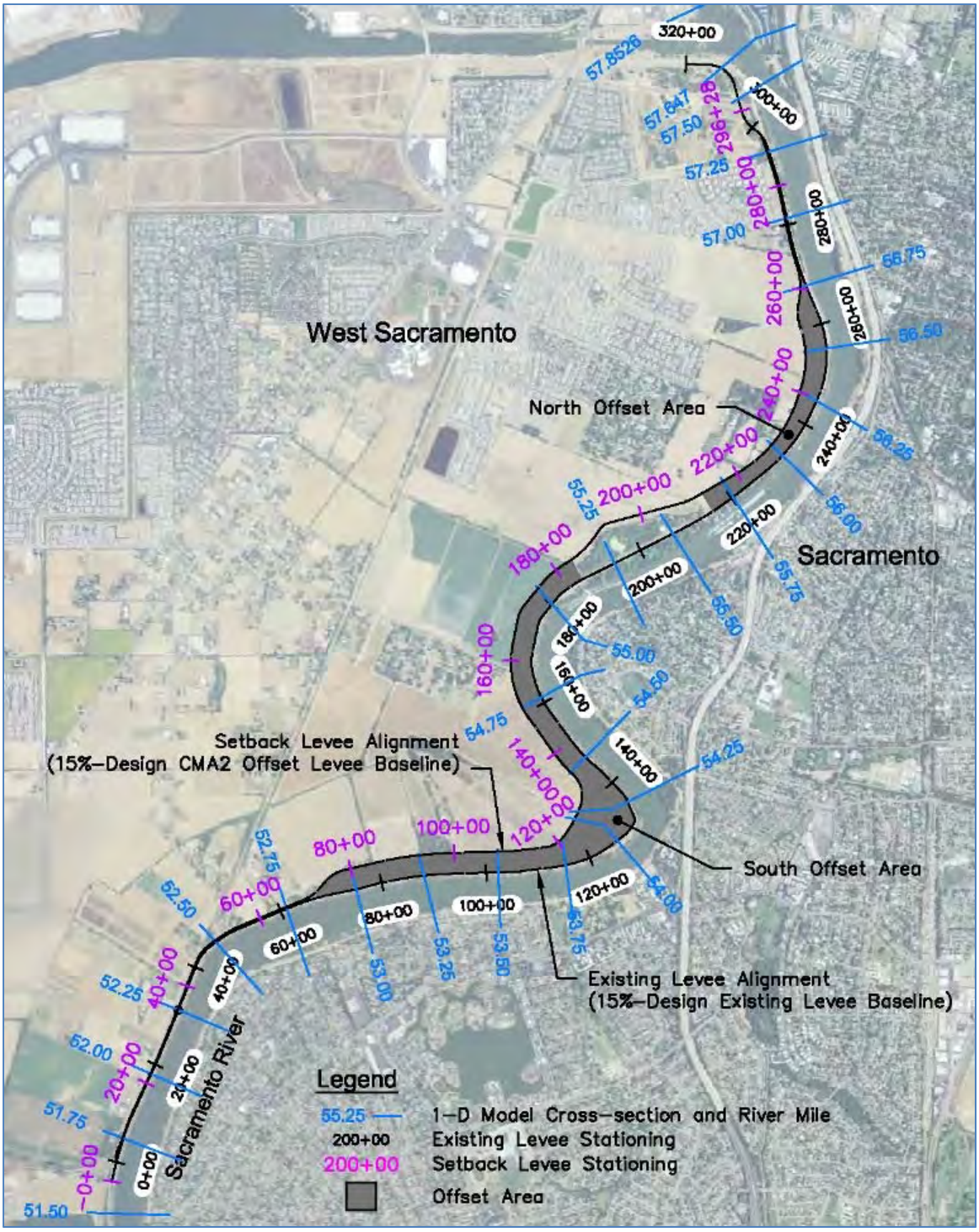


Figure C-1. Cross-section Locations

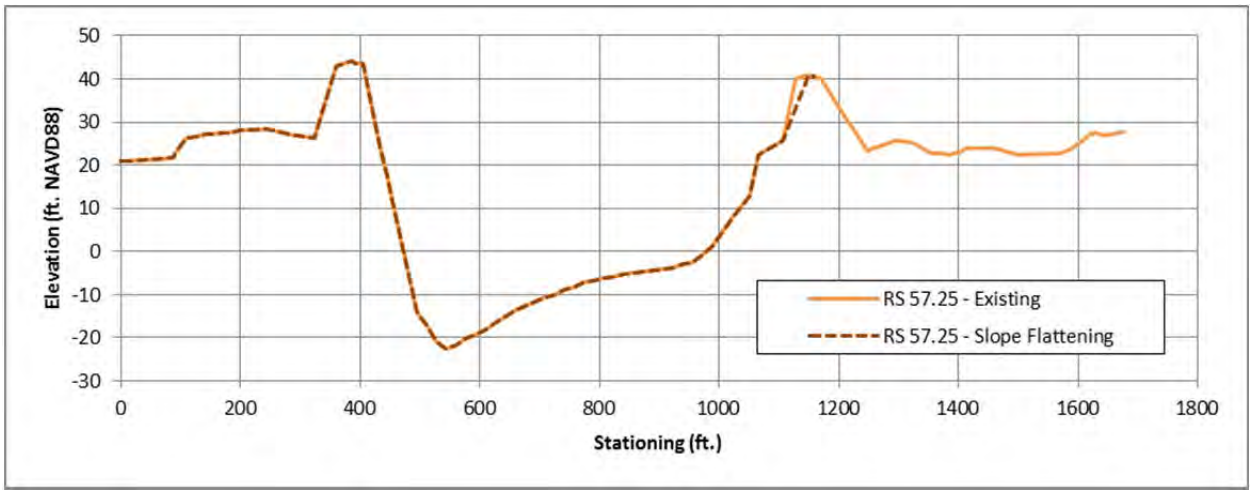


Figure C-2. Cross-section 57.25 (looking downstream)

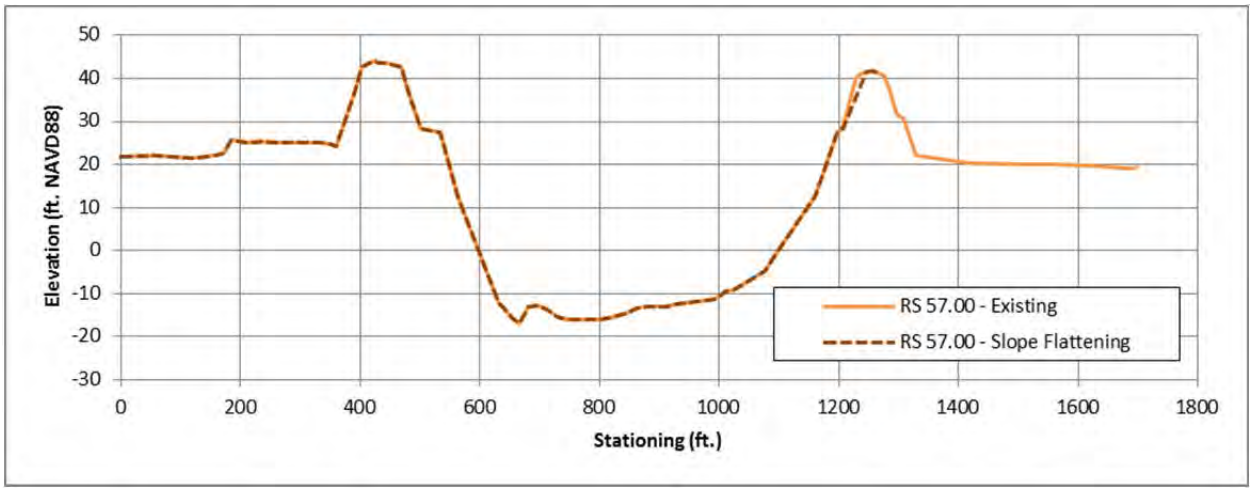


Figure C-3. Cross-section 57.00 (looking downstream)

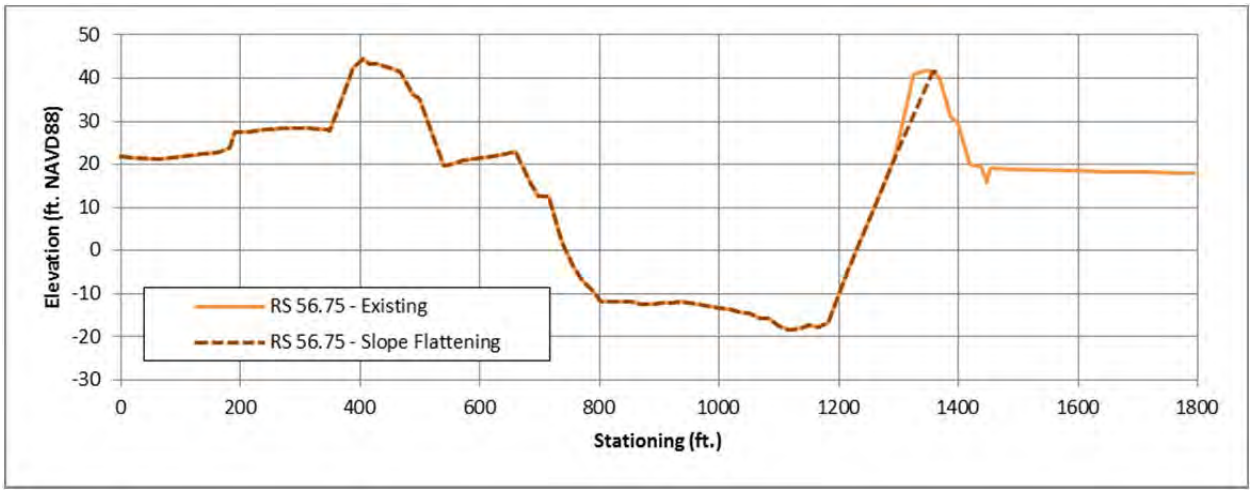


Figure C-4. Cross-section 56.75 (looking downstream)

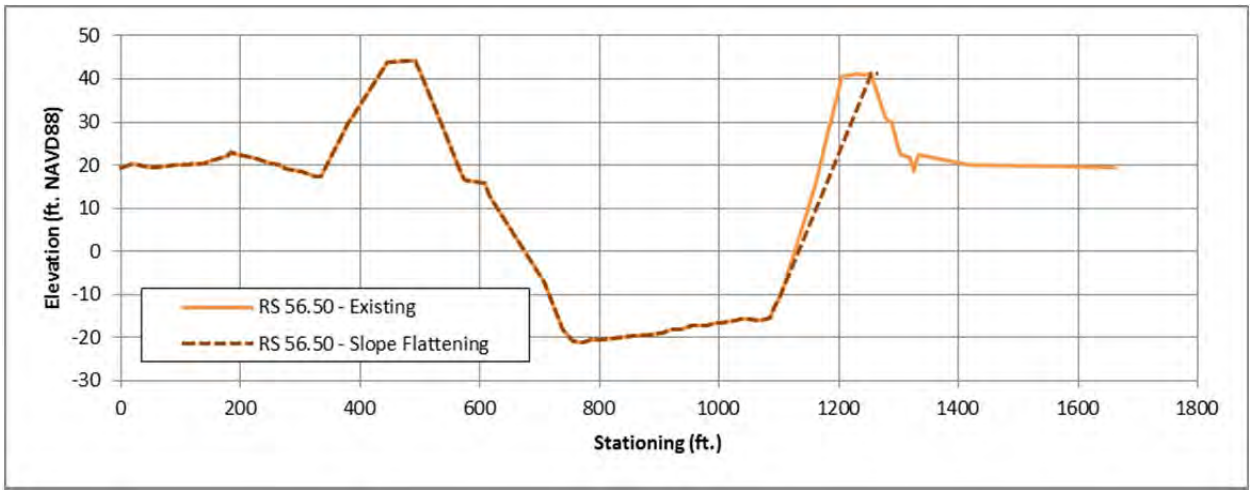


Figure C-5. Cross-section 56.50 (looking downstream)

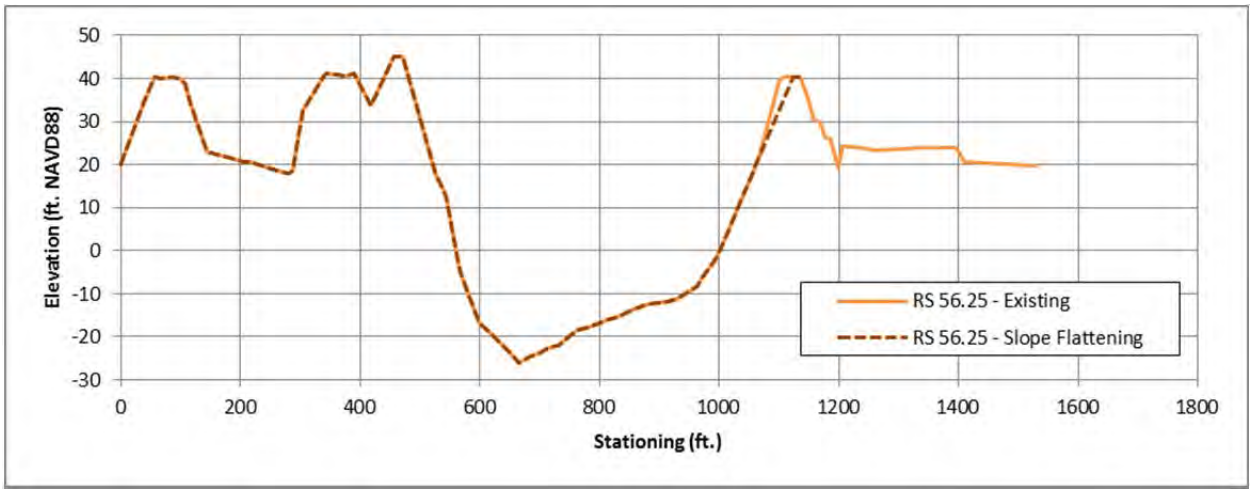


Figure C-6. Cross-section 56.25 (looking downstream)

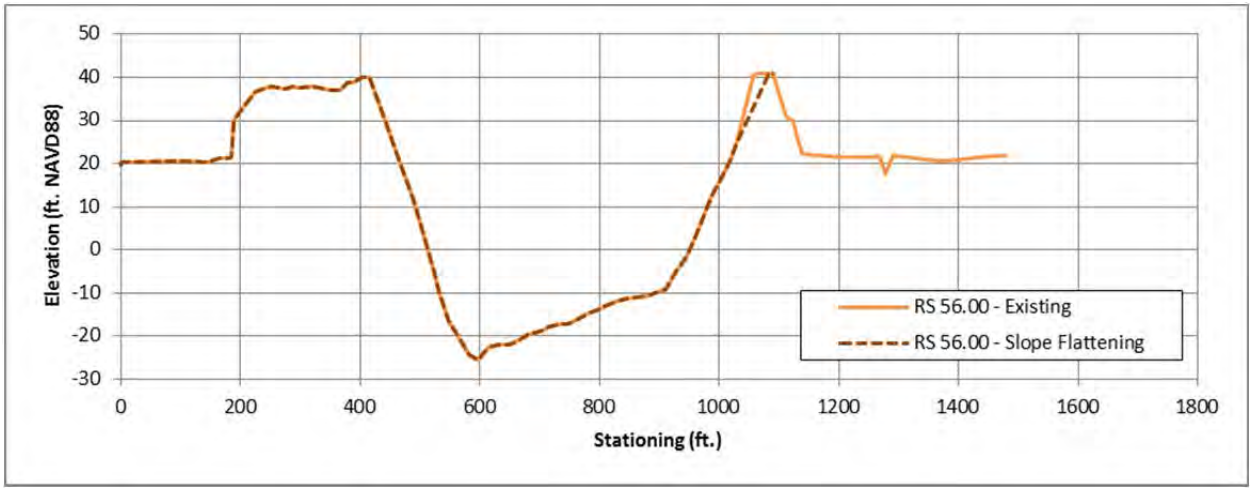


Figure C-7. Cross-section 56.00 (looking downstream)

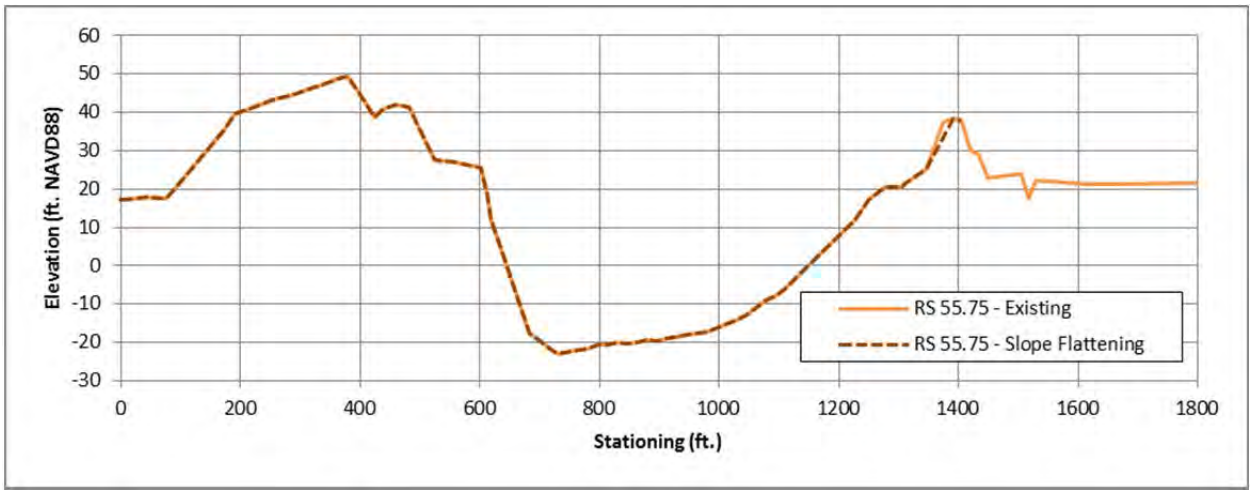


Figure C-8. Cross-section 55.75 (looking downstream)

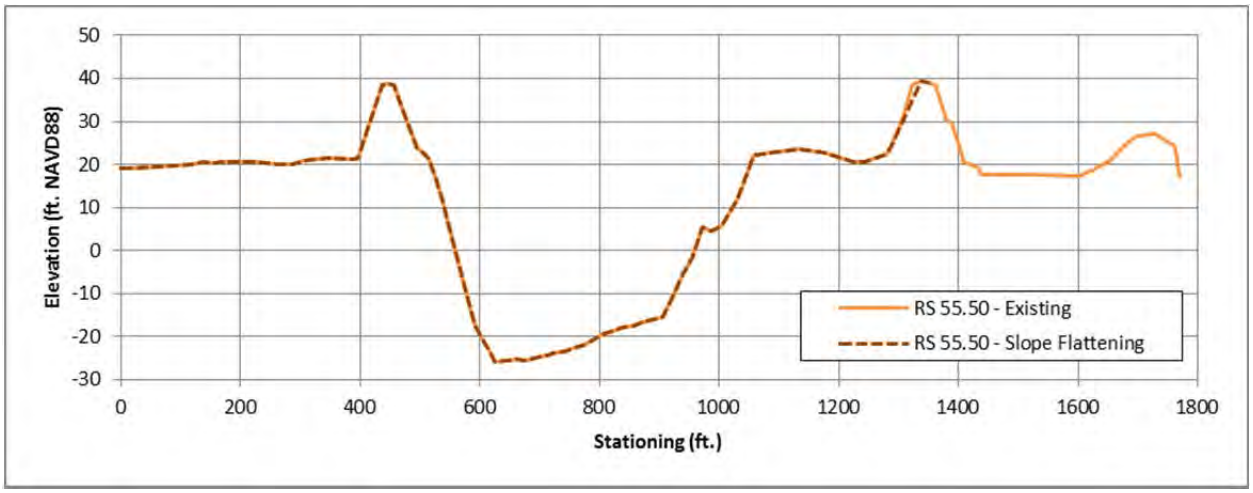


Figure C-9. Cross-section 55.50 (looking downstream)

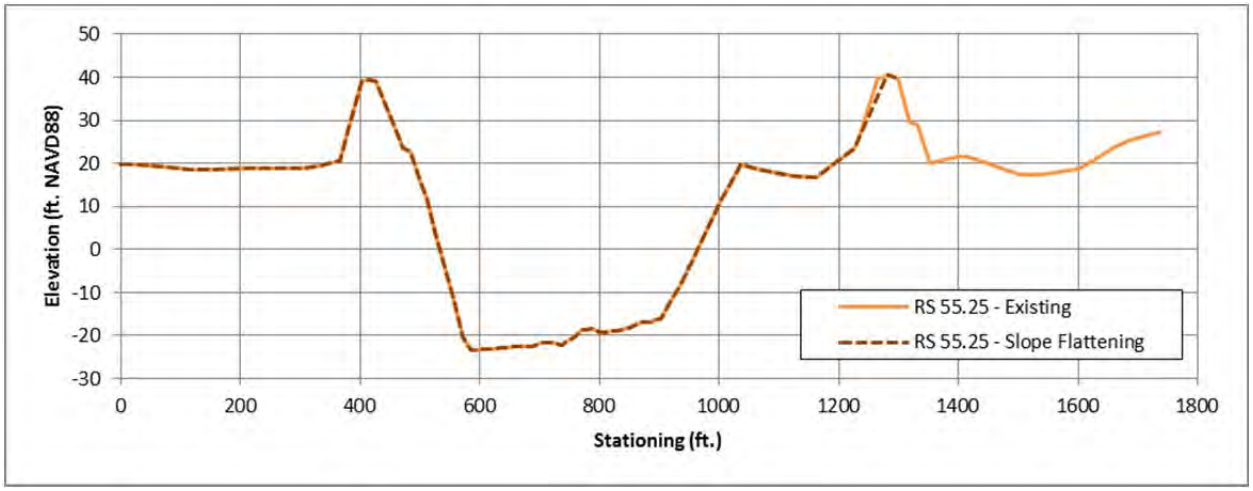


Figure C-10. Cross-section 55.25 (looking downstream)

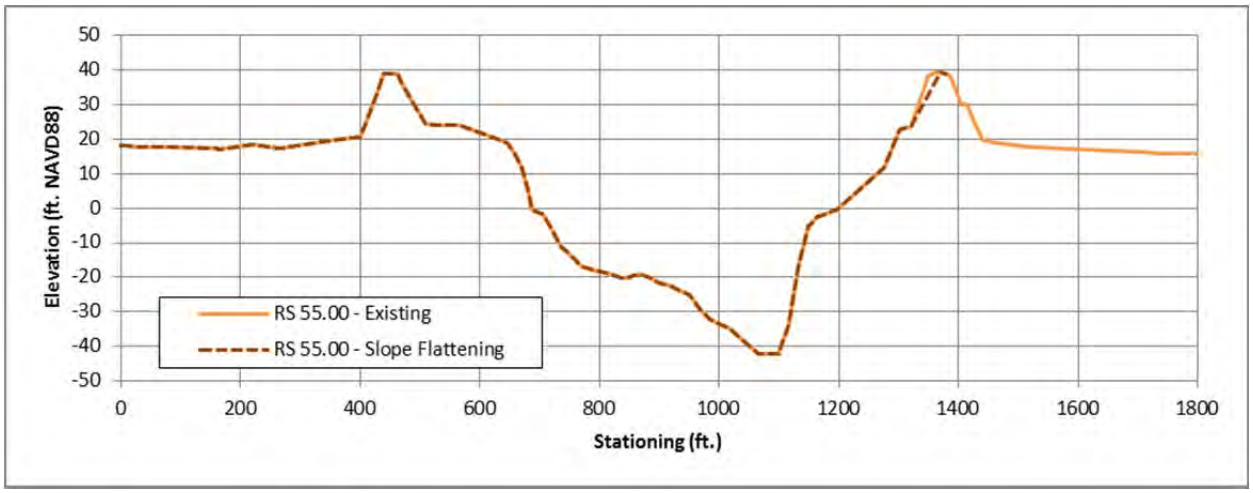


Figure C-11. Cross-section 55.00 (looking downstream)

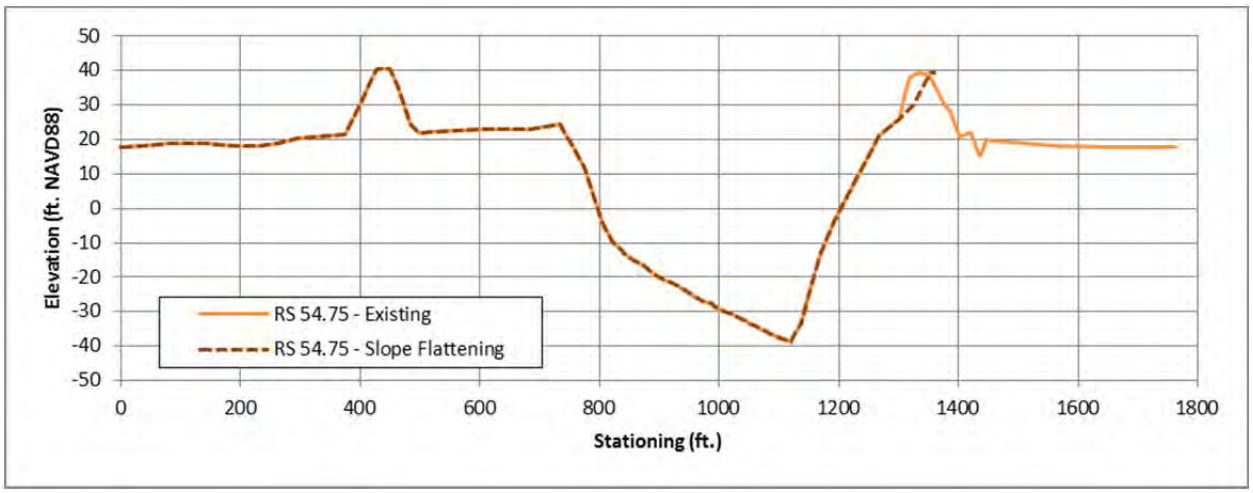


Figure C-12. Cross-section 54.75 (looking downstream)

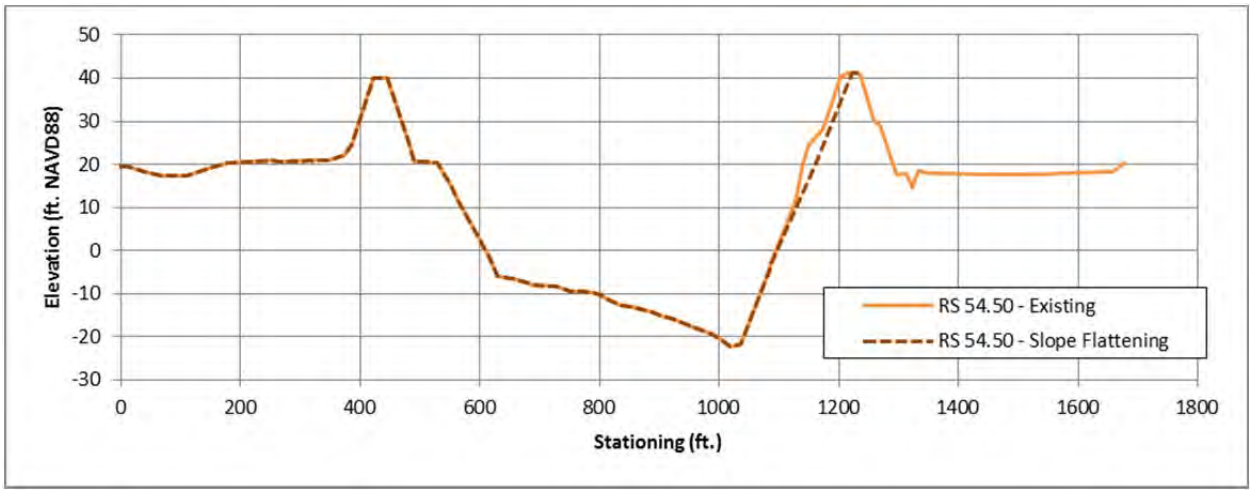


Figure C-13. Cross-section 54.50 (looking downstream)

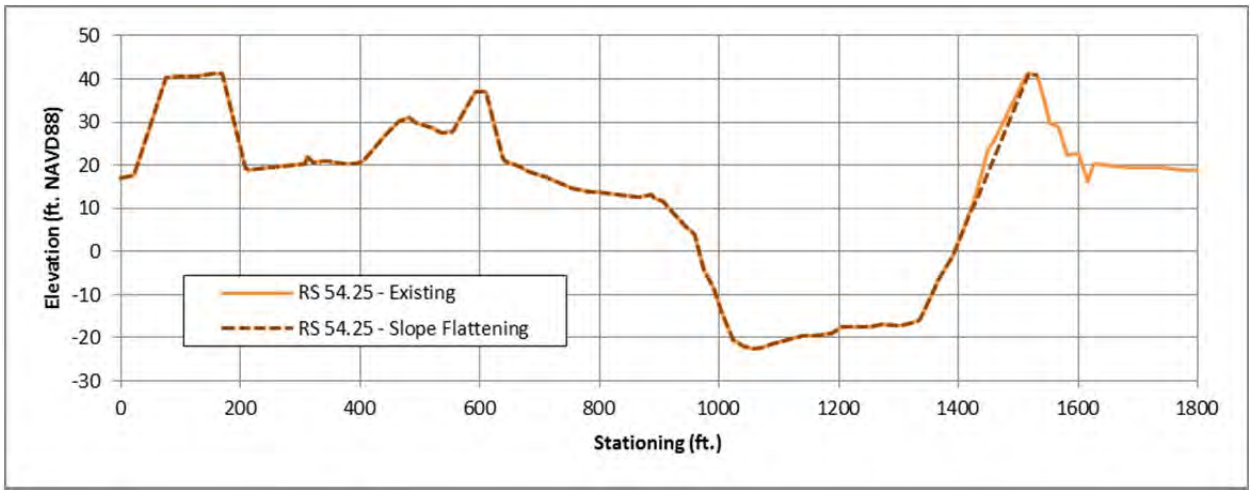


Figure C-14. Cross-section 54.25 (looking downstream)

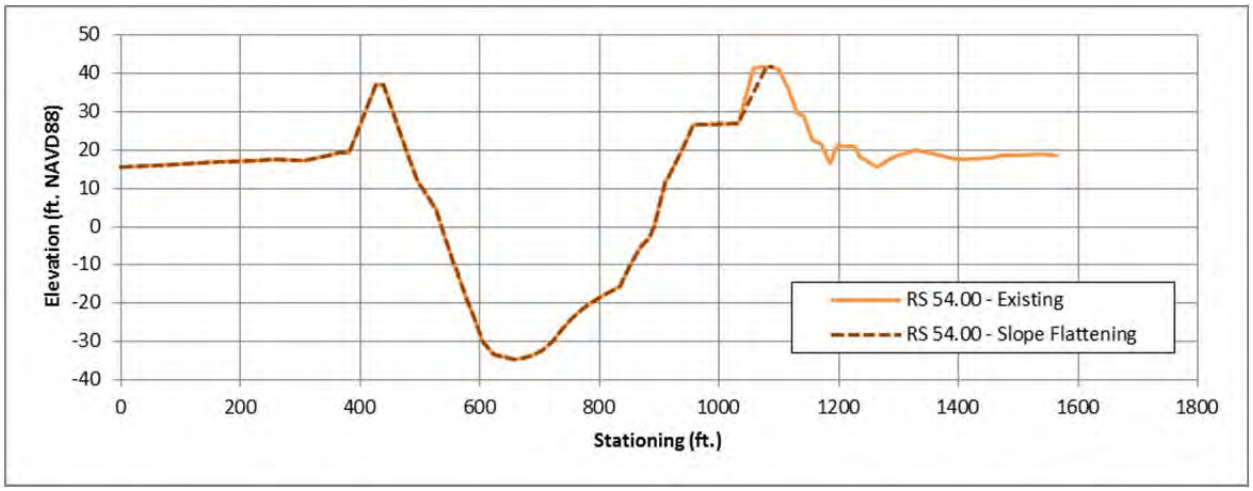


Figure C-15. Cross-section 54.00 (looking downstream)

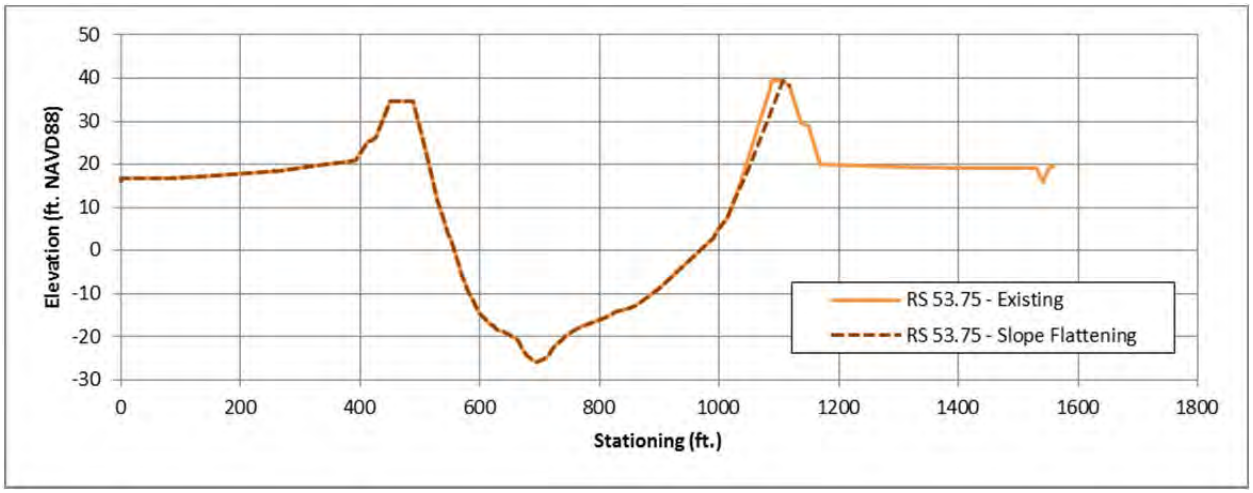


Figure C-16. Cross-section 53.75 (looking downstream)

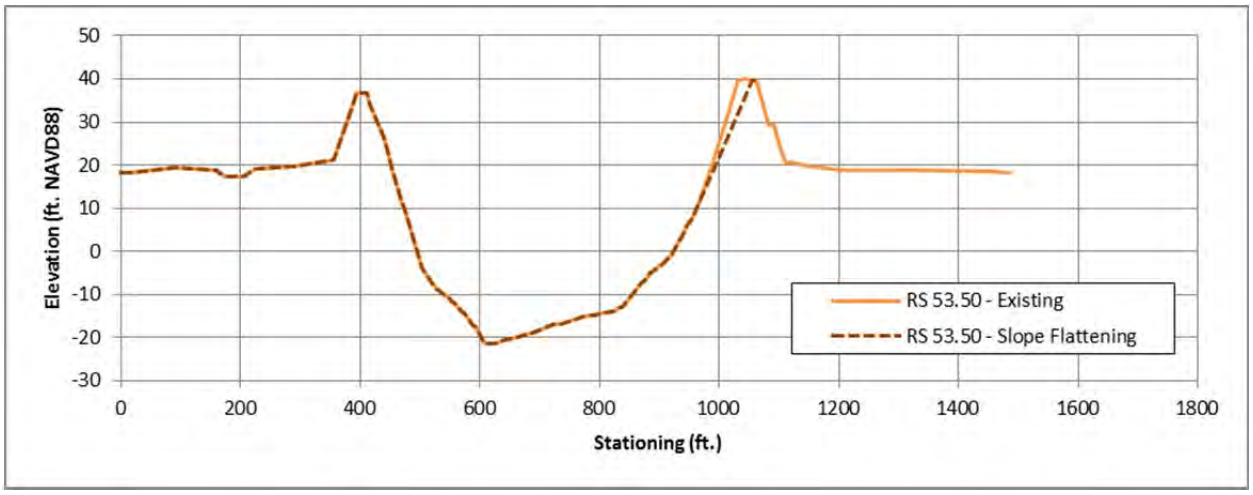


Figure C-17. Cross-section 53.50 (looking downstream)

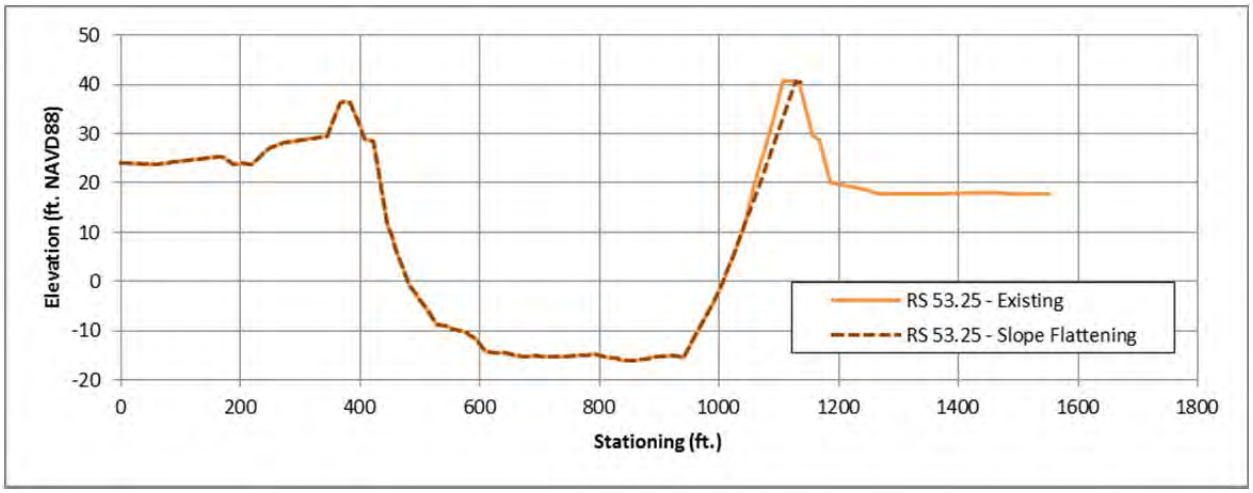


Exhibit C-18. Cross-section 53.25 (looking downstream)

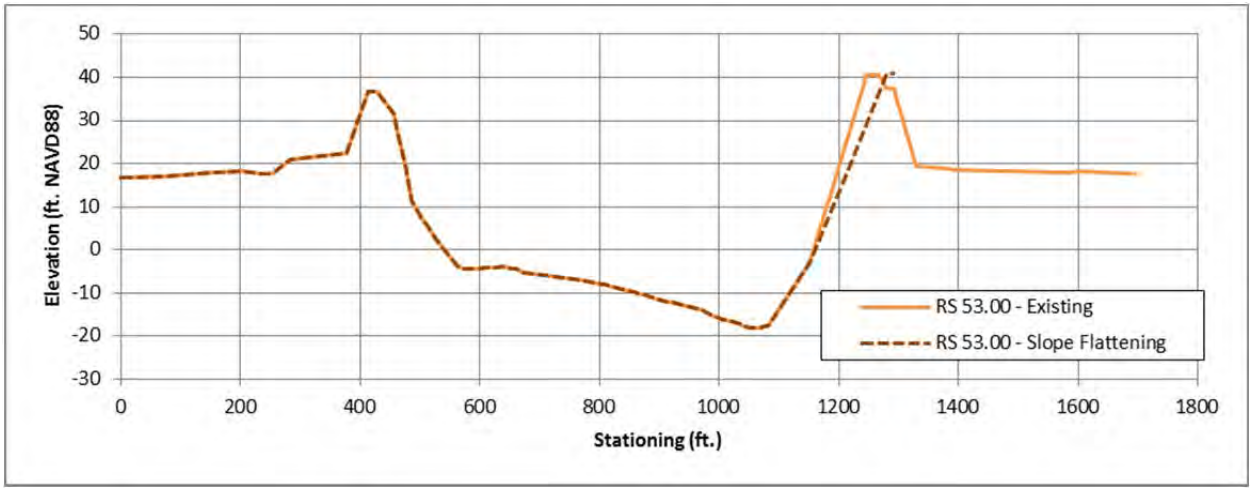


Exhibit C-19. Cross-section 53.00 (looking downstream)

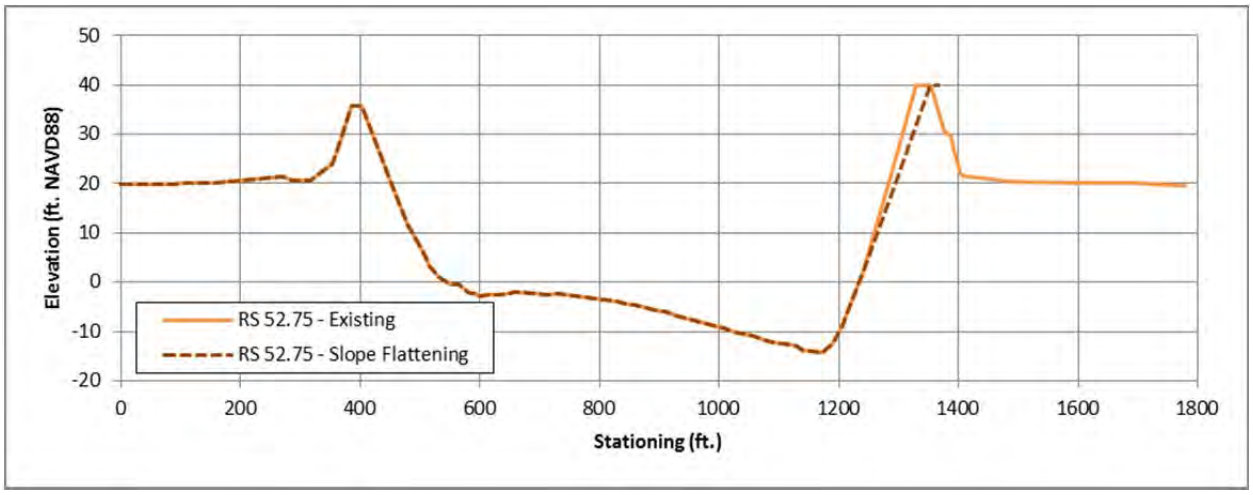


Exhibit C-20. Cross-section 52.75 (looking downstream)

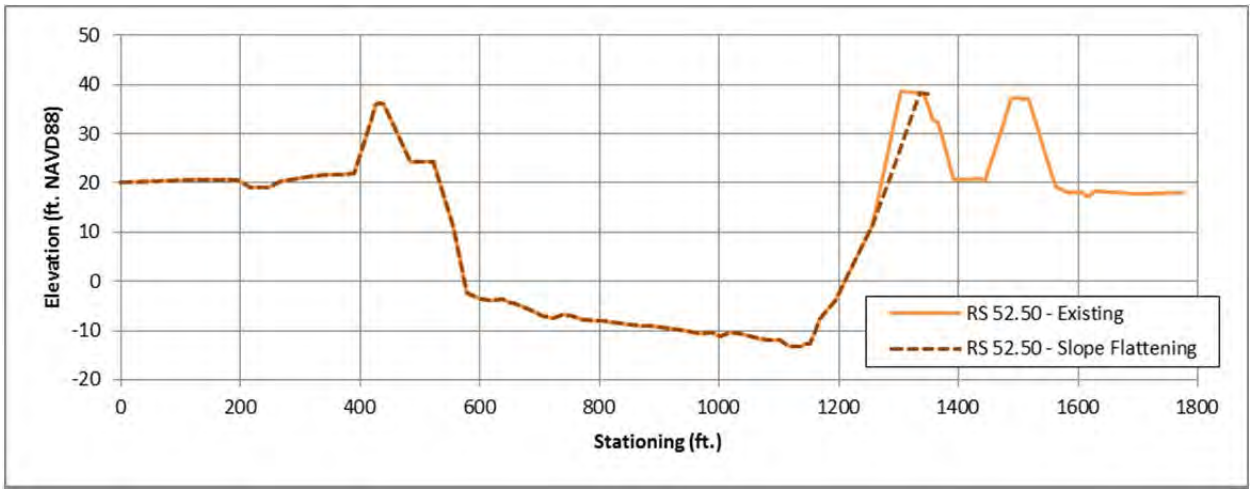


Exhibit C-21. Cross-section 52.50 (looking downstream)

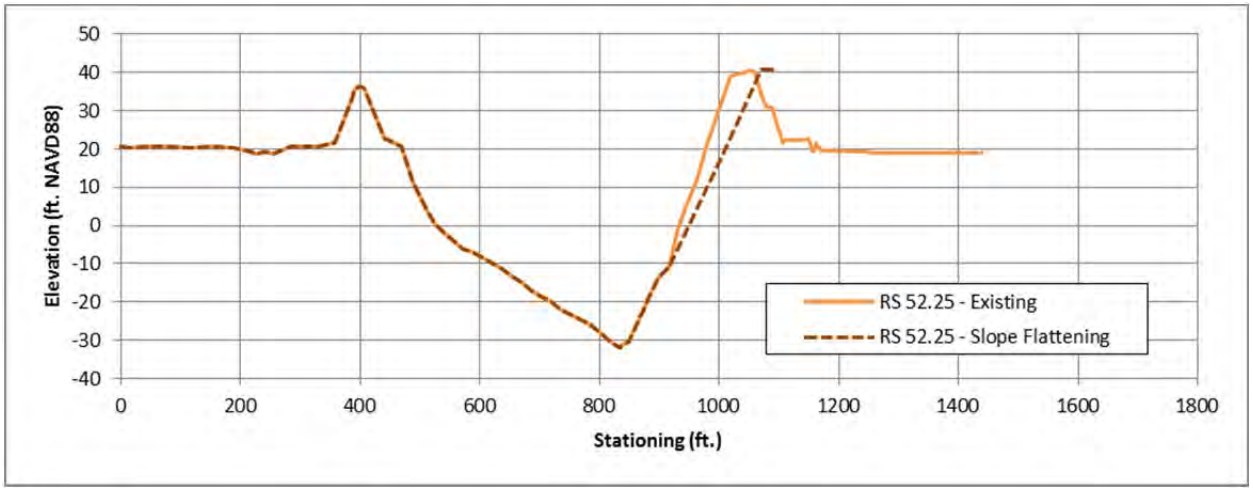


Exhibit C-22. Cross-section 52.25 (looking downstream)

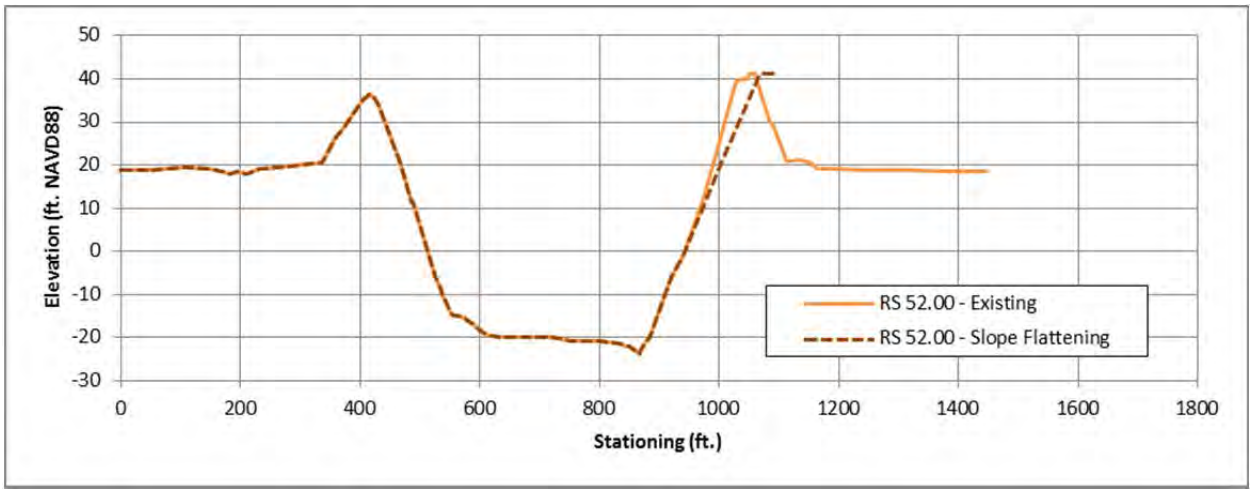


Exhibit C-23. Cross-section 52.00 (looking downstream)

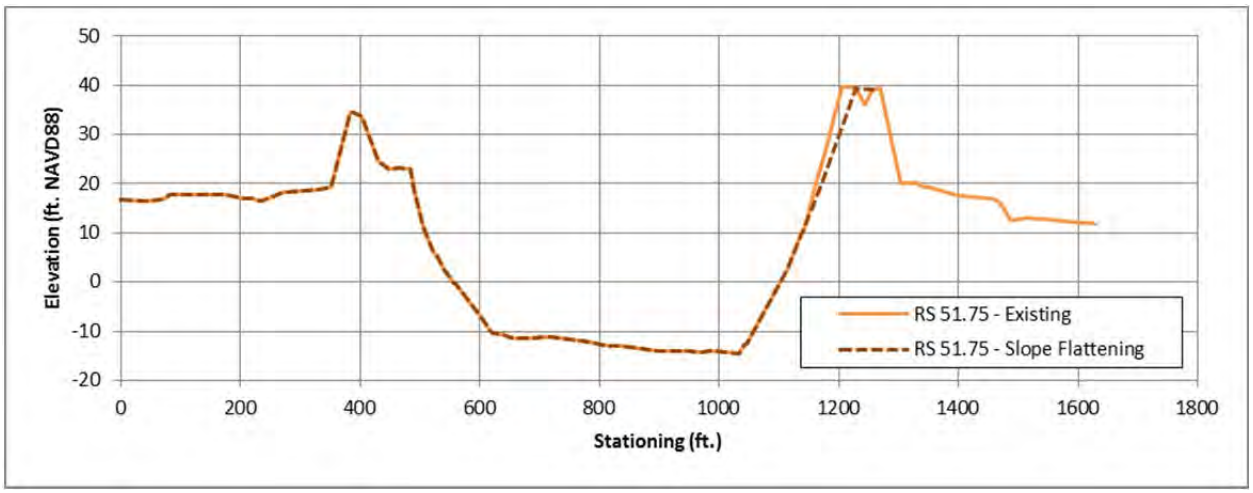


Exhibit C-24. Cross-section 51.75 (looking downstream)

Appendix C.3

Southport Sacramento River Early Implementation Project Interim Condition Hydraulic Impact Analysis—MBK Engineers, September 18, 2013

SOUTHPORT SACRAMENTO RIVER EARLY IMPLEMENTATION PROJECT

INTERIM CONDITION HYDRAULIC IMPACT ANALYSIS

September 18, 2013

Prepared by: Mike Archer, P.E.

Reviewed by: Don Trieu, P.E.

DRAFT

1.0 Purpose

MBK Engineers has evaluated a phased construction approach to reflect how the Southport Sacramento River Early Implementation Project (Southport Project) could be constructed. This memo summarizes that evaluation.

2.0 Proposed Interim Condition

The Southport Project levee setback offset area is effectively divided into two offset areas by Bees Lakes, as shown in Figure 1. The offset area upstream of Bees Lakes will be referred to as the Upper Offset Area and the segment downstream will be referred to as the Lower Offset Area. In both offset areas, the existing project levee, or remnant levee, will be degraded to an elevation of about 30 ft. NAVD88, which is based on the estimated 1/50 AEP flood stage. In the final Southport Project the Upper Offset Area remnant levee will be breached in two locations and the Lower Offset Area remnant levee will be breached in three locations, allowing for flow interchange between the Sacramento River and the offset areas on a relatively frequent basis. The proposed Interim Condition would allow for construction of the downstream-most breaches in the Upper and Lower Offset Areas initially, as shown in Figure 2, and postpone construction of the remaining three breaches to a later construction season.

3.0 Proposed Interim Condition Hydraulic Impact Analysis

The Southport Project RMA2 two-dimensional (2-D) hydraulic simulation model was used to evaluate the effects of the Interim Condition on the 1/100 AEP and 1/200 AEP flood stages. The 2-D analysis is a steady state analysis of the peak flow condition. The flows used in the analysis are summarized in Table 1. The flows vary due to the effects of the evaluated project on the flow split at the confluence of the Sacramento and American Rivers. The Manning's n roughness coefficients assumed for the offset areas were based on the "initial (year 0)" condition from the memorandum "Southport EIP – Roughness Value Development for the Offset Area under Interim and Mature Vegetative Conditions," prepared by cbec eco engineering (cbec) and dated August 28, 2012. The

cbec memorandum provided a range of roughness values for the initial condition, the lowest of which was used for the Proposed Interim Condition analysis. Table 2 provides the maximum water surface elevation increases adjacent to the two offset areas. Profile plots of the computed water surface elevation changes along the Sacramento River East Levee are provided in Figures 3 and 4.

Table 1. Proposed Interim Condition Evaluation Flows, Sacramento River near I Street		
	Flow (cubic feet per second)	
Condition	1/100 AEP	1/200 AEP
Without Project	122,200	134,600
Proposed Interim Condition	122,980	135,520

Table 2. Proposed Interim Condition Maximum Water Surface Increases		
	Increases, in feet	
Condition	1/100 AEP	1/200 AEP
Upstream of Bees Lakes	+ 0.05	+ 0.10
Downstream of Bees Lakes	+ 0.12	+ 0.20

4.0 Comparison with Proposed Project Final Condition

As compared to the Proposed Project Final Condition (see Figures 3 and 4), the proposed Interim Condition showed some reduction in the flood stage change upstream of Bees Lakes, from a maximum of +0.09 ft. to +0.05 ft. in the 1/100 AEP flood and from +0.13 ft. to +0.10 ft. in the 1/200 AEP flood. The proposed Interim Condition had essentially no effect on the flood stage change downstream of Bees Lakes in the 1/100 AEP flood and showed a small increase in the 1/200 AEP flood. The reason for essentially no effect is likely the fact that the remnant levee is overtopped by 1 to 3 feet in the 1/100 AEP flood and by 3 to 5 feet in the 1/200 AEP. Due to this overtopping, not constructing the upper breaches of remnant levee had very little effect on the water surface elevation changes Tables 3 provide a comparison of water surface changes between the Interim Condition and the Final Condition.

Table 3. Proposed Interim Condition Maximum Water Surface Increases		
	Increases, in feet	
Condition	Interim Condition	Final Condition
1/100 AEP		
Upstream of Bees Lakes	+ 0.05	+ 0.09
Downstream of Bees Lakes	+ 0.12	+0.13
1/200 AEP		
Upstream of Bees Lakes	+ 0.10	+ 0.13
Downstream of Bees Lakes	+ 0.20	+ 0.17

DRAFT

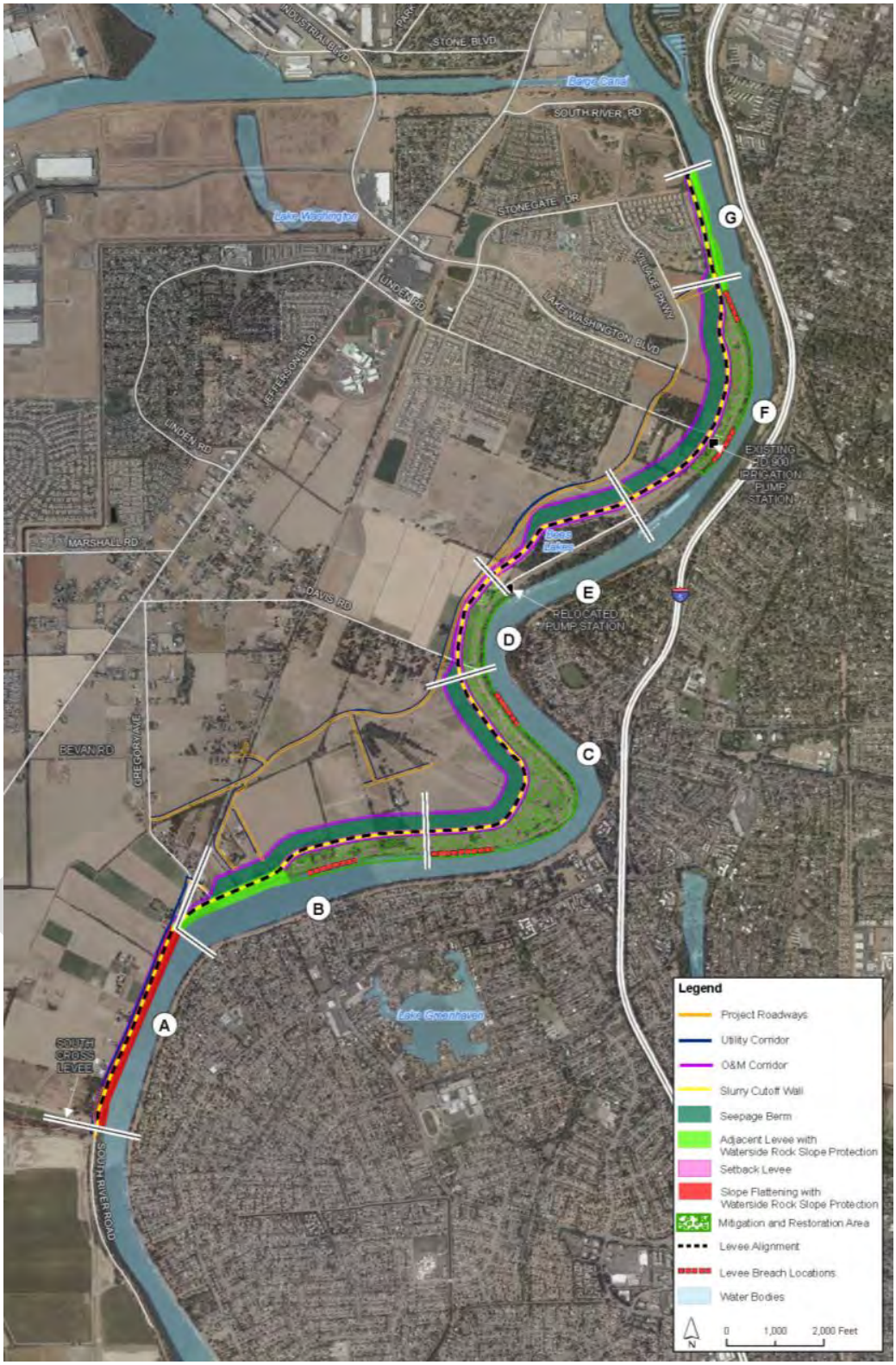


Figure 1. Southport Project, Alternative 5 (Source: ICF International)

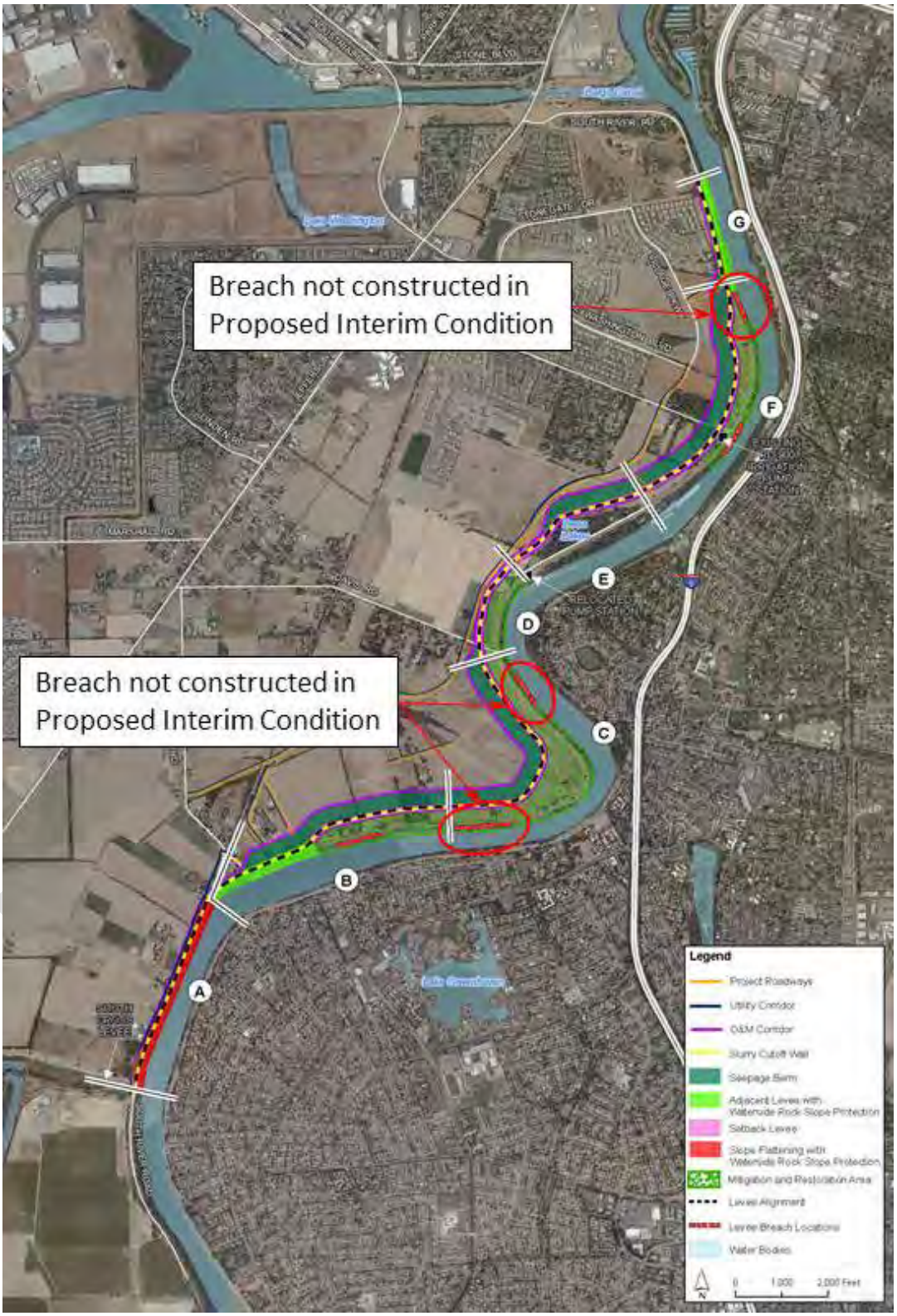


Figure 2. Proposed Interim Condition

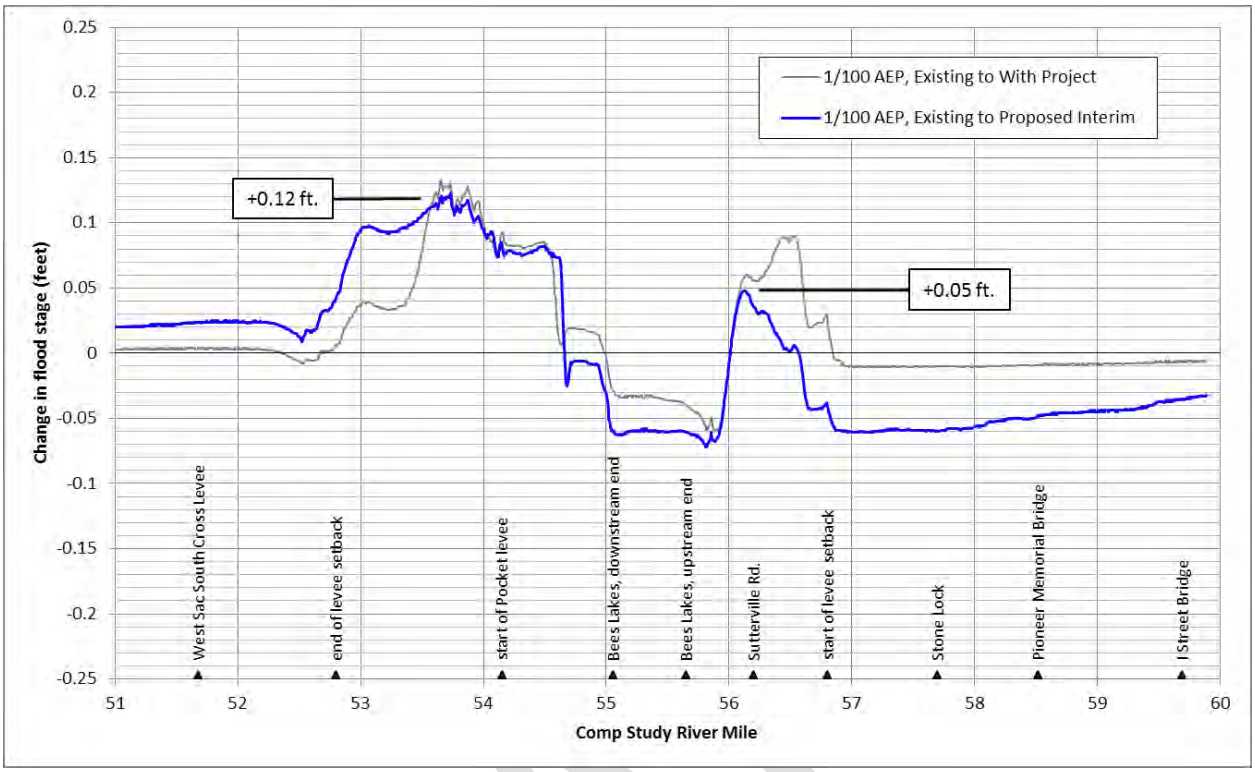


Figure 3. Water Surface Elevation Change due to Proposed Interim Condition, 1/100 AEP

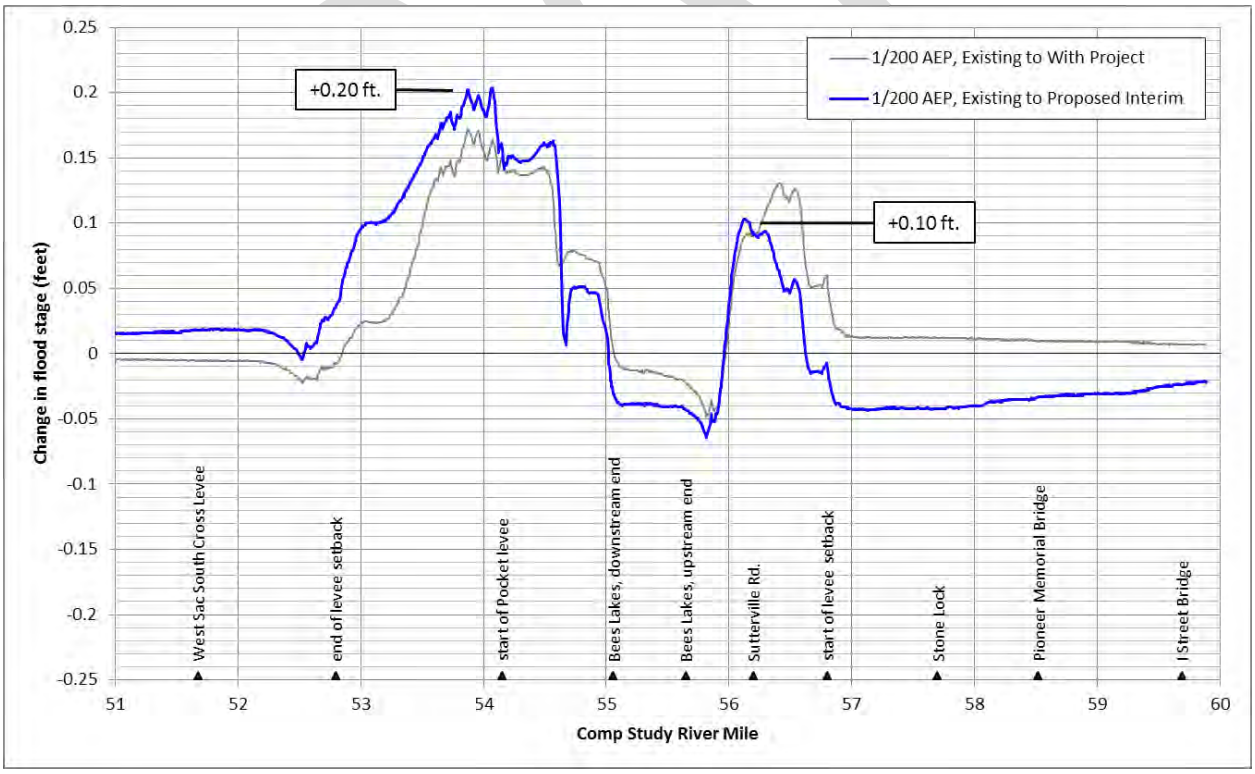


Figure 4. Water Surface Elevation Change due to Proposed Interim Condition, 1/200 AEP

Appendix C.4

Hydraulic Impact Analysis—MBK Engineers, June 29, 2011

HYDRAULIC IMPACT ANALYSIS

Southport Early Implementation Project ***June 29, 2011***

Prepared by: Mike Archer, P.E.

Reviewed by: Don Trieu, P.E.

1.0 Background

The West Sacramento Area Flood Control Agency (WSAFCA) is studying four "Combined Measure Alternative (CMA)" projects for 5 miles of the Sacramento River west levee downstream of Stone Lock in the City of West Sacramento. The project location is shown in Exhibit H-1. A more detailed site map of the project area showing river miles and reference locations is provided in Exhibit H-2. One of the alternatives consists of constructing an adjacent levee on the land side of the existing levee, one involves flattening of the water side slope of the existing levee, and two involve construction of setback levees with partial removal of the existing levee. The alternatives are described in detail in Section 7. MBK Engineers (MBK) has performed a hydraulic impact analysis of the proposed alternatives.

2.0 Purpose

The purpose of the hydraulic impact analysis is to determine the impacts of the proposed CMA's during a flood event with a 1 in 200 annual exceedence probability (200-year). The analysis is focused on answering the following:

1. Does an alternative create the hydraulic benefit of reduced water surface elevations?

2. Does an alternative induce undesirable changes in flow distribution within the Sacramento River waterway system?

3. Does an alternative sustain neutral hydraulic conditions?

4. How would an alternative function in combination with the Folsom Dam Joint Federal Project?

3.0 Hydraulic Model

Release 2 of the U.S. Army Corps of Engineers (USACE) Sacramento River Basin HEC-RAS hydraulic simulation model (Model) was used for this analysis. The extents of the Model are shown in Exhibit H-3. MBK evaluated the Model to ensure that it was adequate for the subject analysis. MBK concluded that the Model was adequate for the subject analysis but also found

some areas where refinements could be made to improve the calibration in the WSAFCA study area. A detailed discussion of the Model refinements is provided in Attachment A.

4.0 Hydrology

USACE developed hydrologic input data for the Model for three hypothetical storm "centerings":

1. Sacramento River Mainstem at Latitude of Sacramento
2. Feather River at Shanghai Bend
3. American River

The centerings relied on historical storm patterns in the upstream basin to define the shape and magnitude of the flow contributions from each of the basins and were designed to stress the locations indicated by the centering name. All three centerings were used in the hydraulic impact analysis. The maximum water surface elevation and flow at any location were defined by the largest values computed from the simulations of the three centerings.

The USACE hydrologic input data included seven annual Exceedence probability flood events: 1 in 2 (2-year), 1 in 10 (10-year), 1 in 25 (25-year) , 1 in 50 (50-year) , 1 in 100 (100-year) , 1 in 200 (200-year) and 1 in 500 (500-year). As noted previously, the analysis presented herein used the 200-year event.

5.0 Levee Performance Assumptions

An important assumption in performing hydraulic simulations of leveed systems on a regional basis is defining if, when, and how levee failures will occur. The analysis presented herein assumed all urban levees, including West Sacramento, had a minimum of three feet of freeboard above the 200-year water surface. Non-urban levees were assumed to be at existing levee heights. Additionally, levees were assumed to act as weirs when overtopped and not degrade or fail.

6.0 Without Project Condition

The without project condition is the baseline to which the project alternatives are compared. This condition represents the flood control system of the Sacramento River and the current reservoir operations at Folsom Dam as of 2010. In addition, the USACE Sacramento River Bank Protection Project Erosion Repair Site RM 57.2R (see Exhibit H-4) was assumed to be part of the without project condition and was included in the model by modifying the cross-section at RM 57.5 as shown in Exhibit H-4. No modification was needed for the cross-section at RM 57.647.

7.0 Project Condition

There are four proposed Combined Measure Alternatives as described in the following Sections.

7.1 Combined Measure Alternative 1 (CMA1)

In CMA1, an adjacent levee is constructed on the land side of the existing levee from levee mile 2.3 to 7.8 (see Exhibit H-5). CMA1 does not change the existing cross-sectional flow area of the Sacramento River, so it does not differ hydraulically from the without project condition.

7.2 Combined Measure Alternative 2 (CMA2)

In CMA2, a setback levee is constructed from levee mile 2.7 to 7.8 (river mile 57.0 to 51.75) with a typical setback distance of approximately 400 feet (see Exhibit H-6). A 1,800 ft. length of the existing levee is degraded to original ground at the upstream end of the setback reach and a 2,600 ft. length is degraded to original ground at the downstream end. The remaining existing levee along the setback reach is assumed to be degraded to the 50-year water surface elevation. A typical cross-section showing modeled levee setback is provided in Exhibit H-7. Plots of all cross-sections modified in the Model are provided in Attachment B.

7.3 Combined Measure Alternative 3 (CMA3)

In CMA3, the water side slope of the existing levee is flattened to a 3:1 slope from levee mile 2.3 to 7.8 (see Exhibit H-8). The existing water side slope is approximately 2:1. The slope flattening slightly increases the cross-sectional flow area as shown in Exhibit H-9. However, the increase is very small, typically less than one half of one percent, and therefore has a negligible impact on the river hydraulics. For this reason, CMA3 is assumed to hydraulically be no different than the without project condition

7.4 Combined Measure Alternative 4 (CMA4)

In CMA4, a setback levee is constructed from levee mile 2.7 to 7.8 (river mile 57.0 to 51.75). The setback distance ranges from 1,000 feet to 3,000 feet (see Exhibit H-10). A 1,800 ft. length of the existing levee is degraded to original ground at the upstream end of the setback reach and a 2,600 ft. length is degraded to original ground at the downstream end. The remaining existing levee along the setback reach is assumed to be degraded to the 50-year water surface elevation. A typical cross-section showing modeled levee setback is provided in Exhibit H-7. Plots of all cross-sections modified in the Model are provided in Attachment B.

8.0 Cumulative Impact Analysis

A cumulative impact analysis was performed to determine how the project alternatives would function in combination with the Folsom Dam Joint Federal Project (JFP), which is currently under construction with completion planned in 2020. The JFP involves the construction of a new auxiliary spillway for Folsom Dam that will provide improved operational control during

extreme hydrologic events. When complete, the JFP is expected to reduce the 200-year Folsom Dam peak release from 320,000 cubic feet per second (cfs) to 160,000 cfs.

9.0 Results

To assess the regional impact of the setback alignments, the computed maximum water surface elevations and flows from the Project Condition simulations were compared with those from the Without Project Condition simulations. The impacts are presented and discussed in the following sections for the following conditions:

- Current Conditions: The Without Project Condition and the Project Condition are both simulated with current Folsom Dam operations (without the JFP).
- Cumulative: The Without Project Condition is simulated with current Folsom Dam operations (without the JFP) and the Project Condition is simulated with future Folsom Dam operations (with JFP).
- Future Conditions: The Without Project Condition and the Project Condition are both simulated with future Folsom Dam operations (with the JFP).

Maximum water surface elevation profiles are provided for the impacted reaches along with summary tables showing values at selected locations which are shown in Exhibit H-2.

The hydraulic model is referenced to the National Geodetic Vertical Datum of 1929 (NGVD29). The computed water surface elevations as referenced in this report have been converted to the North American Vertical Datum of 1988 (NAVD88) by adding 2.57 feet, the West Sacramento Levee Improvement Program project specific value, as documented in the Kjeldsen, Sinnock & Neudeck (KSN), Inc. report entitled “Survey Control Report, City of West Sacramento, Geotechnical Problem Identification and Alternative Analysis” dated January 2007.

9.1 Current Conditions Impact

The current conditions analysis looks at the impacts of the CMA’s assuming current operations (no JFP) in both the without and with project scenarios.

In the Sacramento River, the levee setbacks result in a reduction in peak stage in the vicinity of the setbacks. However, due to the proximity of the setbacks to the American River, the reduction in stage in the Sacramento River results in an increase in flow in the Sacramento River downstream of the American River. The increase in flow offsets some of the stage decrease upstream of the levee setback but results in an increase in stage downstream of the setback. CMA2 and CMA4 increase the peak flow in the Sacramento River downstream of the American River by 1,500 cfs (1.0%) and 4,800 cfs (3.3%), respectively. CMA2 and CMA4 result in maximum reductions in stage on the Sacramento River of 0.08 ft. and 0.27 ft.,

respectively, upstream of the setback (RM 57.00). However, due to the increased flow in the Sacramento River, CMA2 and CMA4 show maximum stage increases downstream of the setbacks (RM 51.75) of 0.09 ft. and 0.28 ft., respectively. The increase is still apparent, though reduced to values of 0.05 ft. and 0.13 ft., twenty-six miles downstream at Walnut Grove. Profile plots of the Sacramento River maximum water surface elevations and project impacts are provided in Exhibit H-11. Peak stages and flows and corresponding project impacts are summarized for several key locations in Tables 1 and 2.

In the Yolo Bypass there were no computed increases in maximum water surface elevation. The maximum computed water surface impact in the Yolo Bypass was a negligible decrease of 0.03 ft. Profile plots of the Yolo Bypass maximum water surface elevations and project impacts are provided in Exhibit H-12. Peak stages and flows and corresponding project impacts are summarized for several key locations in Tables 1 and 2.

In the Sacramento Bypass, there were no computed increases in maximum water surface elevation. The maximum computed water surface impact in the Sacramento Bypass was a decrease of 0.07 ft. Profile plots of the Sacramento Bypass maximum water surface elevations and project impacts are provided in Exhibit H-13. Peak stages and flows and corresponding project impacts are summarized for several key locations in Tables 1 and 2.

The Project Condition alternatives have no impact on the maximum water surface elevation in the Sacramento River Deep Water Ship Channel (Ship Channel) and Port of Sacramento (Port) under current conditions. The computed peak stages in the Port and in the Ship Channel at its southern end near Cache Slough are provided in Table 1.

9.2 Cumulative Impact

The cumulative analysis looks at the impact of the CMA's in conjunction with the JFP. In the cumulative analysis there were no increases in the computed maximum water surface elevations relative to the without project current operations condition.

CMA2 resulted in a maximum decrease in the computed maximum water surface elevation in the Sacramento River of 1.9 ft. just upstream of the setback. CMA4 resulted in a maximum decrease in the computed maximum water surface elevation in the Sacramento River of 2.0 ft. just upstream of the setback. Profile plots of the Sacramento River maximum water surface elevations and project impacts are provided in Exhibit H-14. Peak stages and flows and corresponding project impacts are summarized for several key locations in Tables 3 and 4.

CMA2 resulted in a maximum decrease in the computed maximum water surface elevation in the Yolo Bypass of 0.16 ft. CMA4 resulted in a maximum decrease in the computed maximum water surface elevation in the Yolo Bypass of 0.17 ft. Profile plots of the Yolo Bypass maximum water surface elevations and project impacts are provided in Exhibit H-15. Peak stages and flows and corresponding project impacts are summarized for several key locations in Tables 3 and 4.

CMA2 resulted in a maximum decrease in the computed maximum water surface elevation in the Sacramento Bypass of 0.96 ft. CMA4 resulted in a maximum decrease in the computed maximum water surface elevation in the Sacramento Bypass of 1.00 ft. Profile plots of the Sacramento Bypass maximum water surface elevations and project impacts are provided in Exhibit H-16. Peak stages and flows and corresponding project impacts are summarized for several key locations in Tables 3 and 4.

The Project alternatives decrease the maximum water surface elevation in the Sacramento River Deep Water Ship Channel (Ship Channel) and Port of Sacramento (Port) by about 0.1 feet in the Cumulative analysis. The computed peak stages in the Port and in the Ship Channel at its southern end near Cache Slough are provided in Table 3.

9.3 Future Conditions Impact

The future conditions analysis looks at the impacts of the CMA's assuming implementation of the JFP in both the without and with project scenarios.

CMA2 and CMA4 increase the peak flow in the Sacramento River downstream of the American River by 700 cfs (0.5%) and 2,300 cfs (1.8%), respectively. CMA2 and CMA4 result in maximum reductions in stage on the Sacramento River of 0.06 ft. and 0.18 ft., respectively, upstream of the setback (RM 57.00). However, due to the increased flow in the Sacramento River CMA2 and CMA4 show maximum stage increases downstream of the setbacks (RM 51.75) of 0.10 ft. and 0.32 ft., respectively. The increase is still apparent, though reduced to values of 0.04 ft. and 0.14 ft., twenty-six miles downstream at Walnut Grove. Profile plots of the Sacramento River maximum water surface elevations and project impacts are provided in Exhibit H-17. Peak stages and flows and corresponding project impacts are summarized for several key locations in Tables 5 and 6.

In the Yolo Bypass there were no computed increases in maximum water surface elevation. The maximum computed water surface impact in the Yolo Bypass was a negligible decrease of 0.03 ft. Profile plots of the Yolo Bypass maximum water surface elevations and project impacts are provided in Exhibit H-18. Peak stages and flows and corresponding project impacts are summarized for several key locations in Tables 5 and 6.

In the Sacramento Bypass there were no computed increases in maximum water surface elevation. The maximum computed water surface impact in the Sacramento Bypass was a decrease of 0.06 ft. Profile plots of the Sacramento Bypass maximum water surface elevations and project impacts are provided in Exhibit H-19. Peak stages and flows and corresponding project impacts are summarized for several key locations in Tables 5 and 6.

The Project alternatives have no impact on the maximum water surface elevation in the Sacramento River Deep Water Ship Channel (Ship Channel) and Port of Sacramento (Port) under future conditions. The computed peak stages in the Port and in the Ship Channel at its southern end near Cache Slough are provided in Table 5.

Table 1. Impact on Maximum Water Surface Elevations, Current Conditions (without JFP)

ID	River	Location	Comp Study River Mile	Maximum Water Surface Elevation (ft. NAVD88)			Difference (ft)	
				Without Project	With Project			
					CMA2	CMA4	CMA2	CMA4
SR1	Sacramento River	At Natomas Cross Canal	79.205	44.57	44.57	44.57	0	0
SR2	Sacramento River	At Sacramento Weir	63.81	37.61	37.57	37.51	-0.04	-0.10
SR3	Sacramento River	At Interstate 80	62.97	37.72	37.69	37.63	-0.03	-0.09
SR4	Sacramento River	At I Street Bridge	59.692	37.96	37.92	37.81	-0.04	-0.15
SR5	Sacramento River	At upstream end of Levee Setback	57.00	36.28	36.20	36.01	-0.08	-0.27
SR6	Sacramento River	Near Davis Road	54.75	35.27	35.29	35.21	+0.02	-0.06
SR7	Sacramento River	At downstream end of Levee Setback	51.75	33.63	33.72	33.91	+0.09	+0.28
SR8	Sacramento River	At Babel Slough	50.00	32.88	32.97	33.16	+0.09	+0.28
SR9	Sacramento River	At Freeport Bridge	46.43	30.89	30.98	31.14	+0.09	+0.25
SR10	Sacramento River	At Walnut Grove	26.75	18.22	18.27	18.35	+0.05	+0.13
YB1	Yolo Bypass	At Interstate 5	50.496	36.58	36.58	36.57	0	-0.01
YB2	Yolo Bypass	At Sacramento Bypass	44.13	33.38	33.37	33.35	-0.01	-0.03
YB3	Yolo Bypass	At Lisbon Gage	35.672	29.45	29.44	29.43	-0.01	-0.02
SB1	Sacramento Bypass	Below Sacramento Weir	1.49	36.07	36.05	36.00	-0.02	-0.07
SB2	Sacramento Bypass	At Yolo Bypass	0	33.38	33.37	33.35	-0.01	-0.03
SC1	Deep Water Ship Channel	Port of Sacramento	42.984	17.09	17.09	17.09	0	0
SC2	Deep Water Ship Channel	At Cache Slough	19.54	17.03	17.03	17.03	0	0

Table 2. Impact on Maximum Flows, Current Conditions (without JFP)

Location	Maximum Flow (cfs) [1]			Difference (%)	
	Without Project	With Project			
		CMA2	CMA4	CMA2	CMA4
Sacramento River above Sacramento Weir	116,300	116,400	116,500	0.1%	0.2%
Sacramento River below Sacramento Weir	-98,900	-97,900	-95,800	-1.0%	-3.1%
Sacramento River below American River (upstream of Project)	147,400	148,900	152,200	1.0%	3.3%
Sacramento River at Freeport (downstream of Project)	144,400	145,300	147,000	0.6%	1.8%
Sacramento Weir	193,400	192,700	191,200	-0.4%	-1.1%
Fremont Weir	471,300	471,200	471,300	0%	0%
Yolo Bypass below Sacramento Bypass	655,300	654,800	653,400	-0.1%	-0.3%

[1] Negative value indicates flow in upstream direction. For the reach between the Sacramento Weir and the American River this occurs when the Sacramento Weir gates are open and the American River flow is high. The American River flow splits when it reaches the Sacramento River with some heading upstream towards the Sacramento Weir and the rest heading downstream.

Table 3. Cumulative Impact on Maximum Water Surface Elevations (Current operation without project to future operation with project)

ID	River	Location	Comp Study River Mile	Maximum Water Surface Elevation (ft. NAVD88)			Difference (ft)	
				Without Project	With Project			
					CMA2	CMA4	CMA2	CMA4
SR1	Sacramento River	At Natomas Cross Canal	79.205	44.57	44.55	44.55	-0.02	-0.02
SR2	Sacramento River	At Sacramento Weir	63.81	37.61	35.96	35.91	-1.65	-1.70
SR3	Sacramento River	At Interstate 80	62.97	37.72	36.45	36.40	-1.27	-1.32
SR4	Sacramento River	At I Street Bridge	59.692	37.96	36.06	35.99	-1.90	-1.97
SR5	Sacramento River	At upstream end of Levee Setback	57.00	36.28	34.39	34.27	-1.89	-2.01
SR6	Sacramento River	Near Davis Road	54.75	35.27	33.53	33.51	-1.74	-1.76
SR7	Sacramento River	At downstream end of Levee Setback	51.75	33.63	32.06	32.28	-1.57	-1.35
SR8	Sacramento River	At Babel Slough	50.00	32.88	31.34	31.56	-1.54	-1.32
SR9	Sacramento River	At Freeport Bridge	46.43	30.89	29.49	29.70	-1.40	-1.19
SR10	Sacramento River	At Walnut Grove	26.75	18.22	17.84	17.94	-0.38	-0.28
YB1	Yolo Bypass	At Interstate 5	50.496	36.58	36.50	36.50	-0.08	-0.08
YB2	Yolo Bypass	At Sacramento Bypass	44.13	33.38	33.24	33.22	-0.14	-0.16
YB3	Yolo Bypass	At Lisbon Gage	35.672	29.45	29.35	29.33	-0.10	-0.12
SB1	Sacramento Bypass	Below Sacramento Weir	1.49	36.07	35.11	35.07	-0.96	-1.00
SB2	Sacramento Bypass	At Yolo Bypass	0	33.38	33.24	33.22	-0.14	-0.16
SC1	Deep Water Ship Channel	Port of Sacramento	42.984	17.09	16.97	16.97	-0.12	-0.12
SC2	Deep Water Ship Channel	At Cache Slough	19.54	17.03	16.92	16.91	-0.11	-0.12

Table 4. Cumulative Impact on Maximum Flows (Current operation without project to future operation with project)

Location	Maximum Flow (cfs) [1]			Difference (%)	
	Without Project	With Project			
		CMA2	CMA4	CMA2	CMA4
Sacramento River above Sacramento Weir	116,300	116,400	116,500	0.1%	0.2%
Sacramento River below Sacramento Weir	-98,900	-48,700	-47,100	-50.8%	-52.4%
Sacramento River below American River (upstream of Project)	147,400	131,900	133,500	-10.5%	-9.4%
Sacramento River at Freeport (downstream of Project)	144,400	131,700	133,300	-8.8%	-7.7%
Sacramento Weir	193,400	146,700	145,200	-24.1%	-24.9%
Fremont Weir	471,300	471,400	471,400	0%	0%
Yolo Bypass below Sacramento Bypass	655,300	642,600	641,500	-1.9%	-2.1%

[1] Negative value indicates flow in upstream direction. For the reach between the Sacramento Weir and the American River this occurs when the Sacramento Weir gates are open and the American River flow is high. The American River flow splits when it reaches the Sacramento River with some heading upstream towards the Sacramento Weir and the rest heading downstream.

Table 5. Impact on Maximum Water Surface Elevations, Future Conditions (with JFP)

ID	River	Location	Comp Study River Mile	Maximum Water Surface Elevation (ft. NAVD88)			Difference (ft)	
				Without Project	With Project			
					CMA2	CMA4	CMA2	CMA4
SR1	Sacramento River	At Natomas Cross Canal	79.205	44.55	44.55	44.55	0	0
SR2	Sacramento River	At Sacramento Weir	63.81	35.99	35.96	35.91	-0.03	-0.08
SR3	Sacramento River	At Interstate 80	62.97	36.47	36.45	36.40	-0.02	-0.07
SR4	Sacramento River	At I Street Bridge	59.692	36.10	36.06	35.99	-0.04	-0.11
SR5	Sacramento River	At upstream end of Levee Setback	57.00	34.45	34.39	34.27	-0.06	-0.18
SR6	Sacramento River	Near Davis Road	54.75	33.50	33.53	33.51	+0.03	+0.01
SR7	Sacramento River	At downstream end of Levee Setback	51.75	31.96	32.06	32.28	+0.10	+0.32
SR8	Sacramento River	At Babel Slough	50.00	31.24	31.34	31.56	+0.10	+0.32
SR9	Sacramento River	At Freeport Bridge	46.43	29.40	29.49	29.70	+0.09	+0.30
SR10	Sacramento River	At Walnut Grove	26.75	17.80	17.84	17.94	+0.04	+0.14
YB1	Yolo Bypass	At Interstate 5	50.496	36.51	36.50	36.50	-0.01	-0.01
YB2	Yolo Bypass	At Sacramento Bypass	44.13	33.25	33.24	33.22	-0.01	-0.03
YB3	Yolo Bypass	At Lisbon Gage	35.672	29.35	29.35	29.33	0	-0.02
SB1	Sacramento Bypass	Below Sacramento Weir	1.49	35.13	35.11	35.07	-0.02	-0.06
SB2	Sacramento Bypass	At Yolo Bypass	0	33.25	33.24	33.22	-0.01	-0.03
SC1	Deep Water Ship Channel	Port of Sacramento	42.984	16.97	16.97	16.97	0	0
SC2	Deep Water Ship Channel	At Cache Slough	19.54	16.92	16.92	16.91	0	-0.01

Table 6. Impact on Maximum Flows, Future Conditions (with JFP)

Location	Maximum Flow (cfs) [1]			Difference (%)	
	Without Project	With Project			
		CMA2	CMA4	CMA2	CMA4
Sacramento River above Sacramento Weir	116,300	116,400	116,500	0.1%	0.2%
Sacramento River below Sacramento Weir	-49,600	-48,700	-47,100	-1.8%	-5.0%
Sacramento River below American River (upstream of Project)	131,200	131,900	133,500	0.5%	1.8%
Sacramento River at Freeport (downstream of Project)	131,000	131,700	133,300	0.5%	1.8%
Sacramento Weir	147,400	146,700	145,200	-0.5%	-1.5%
Fremont Weir	471,300	471,400	471,400	0.0%	0.0%
Yolo Bypass below Sacramento Bypass	643,400	642,600	641,500	-0.1%	-0.3%

[1] Negative value indicates flow in upstream direction. For the reach between the Sacramento Weir and the American River this occurs when the Sacramento Weir gates are open and the American River flow is high. The American River flow splits when it reaches the Sacramento River with some heading upstream towards the Sacramento Weir and the rest heading downstream.

10.0 Future Hydraulic Analysis

The hydraulic analysis performed for the interim preliminary design phase focused on determining what the system wide hydraulic impacts would be as a result of the setback alternatives. We focused on determining if there were undesirable changes in flow distribution, beneficial and adverse water surface elevations changes, and assessing cumulative impacts.

During the next phase of this study (final preliminary design), the hydraulic analysis will continue to focus on answering questions presented in Section 2 but will further expand to address river reach and site specific questions. We will be developing a 2-dimensional hydraulic model of the Sacramento River in the project vicinity to corroborate our 1-dimensional model results and perform more detailed hydraulic analysis of features such as partial levee removal, setback grading, and habitat enhancement.

EXHIBITS

WSAFCA
West Sacramento Area Flood Control Agency

Levee Improvement Program Southport Early Implementation Project

Project Manager
M. VECCHIO, HDR

Designed
M. ARCHER, MBK

Checked
B. JONES, HDR

Drawn
A. ARNOLD, HDR

- PROJECT_BOUNDARY
- COUNTIES
- INTERSTATE
- US HIGHWAY
- STATE HIGHWAY
- WATERWAYS AND WATER BODIES

Location Map

Exhibit H-1

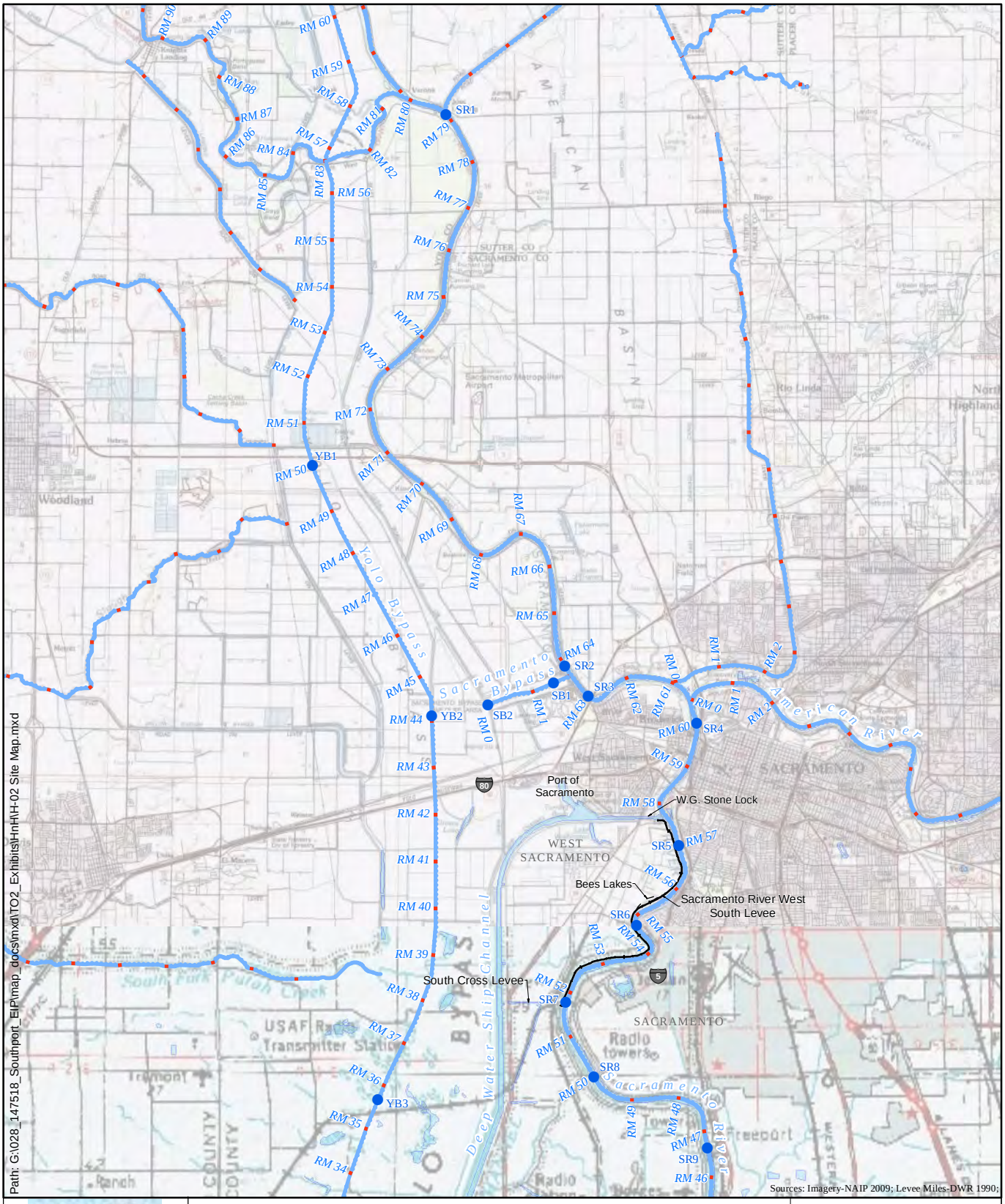
Project Num: 453318-157784-028

May 2011

N W E S

0 1 2 3 4

Miles
1 in = 4 miles



WSAFCA
West Sacramento Area Flood Control Agency

Levee Improvement Program Southport Early Implementation Project

Project Manager
M. VECCHIO, HDR

Designed
M. ARCHER, MBK

Checked
B. JONES, HDR

Drawn
A. ARNOLD, HDR

SB1 **INDEX POINT LOCATION**

WATERWAY CENTERLINE

RM 57 **RIVER MILES**

PROJECT STATIONING

Site Map

Exhibit H-2

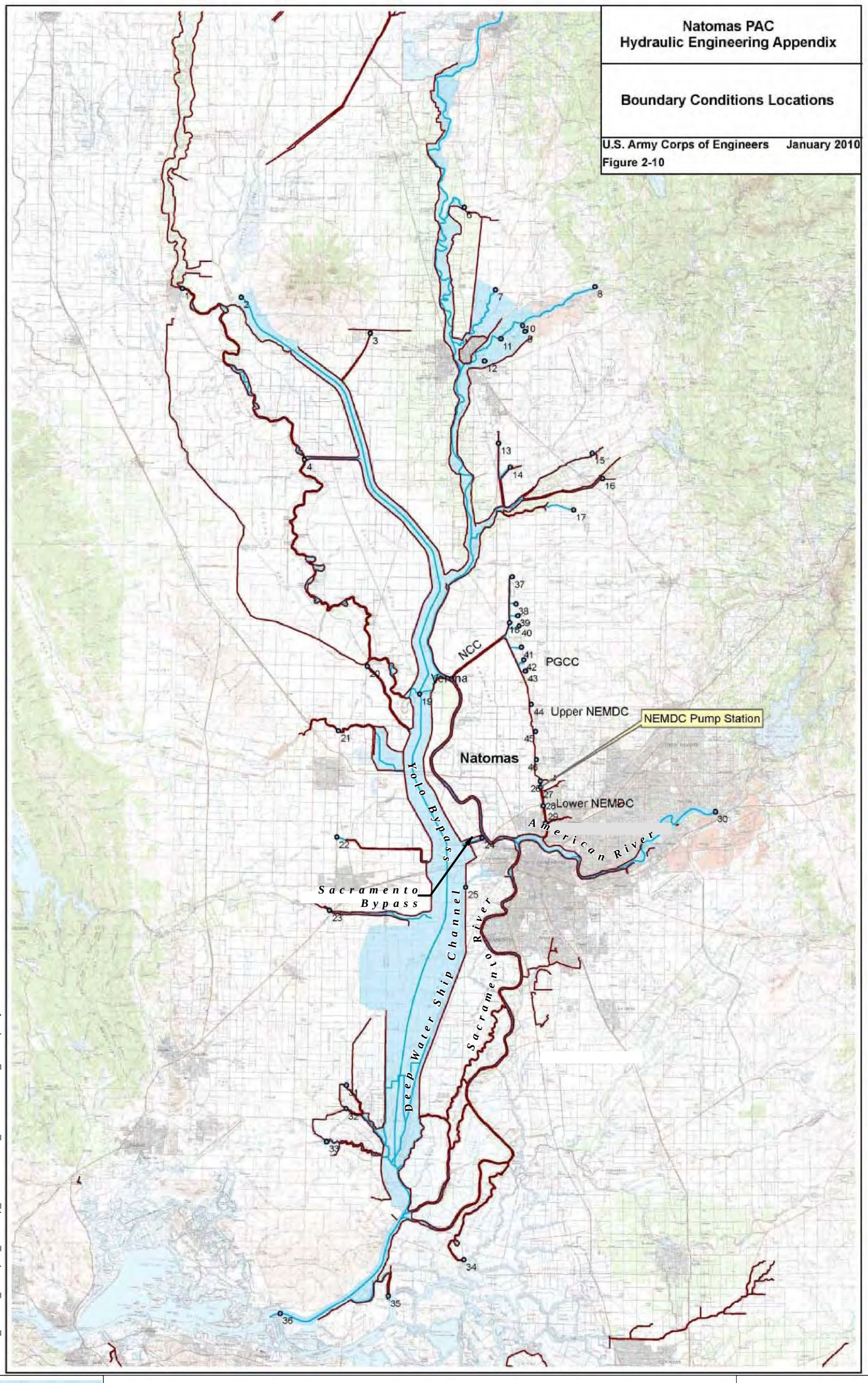
Project Num: 453318-157784-028

May 2011

N W E S

0 1 2 3

Miles
1 in = 3 miles



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Levee Improvement Program Southport Early Implementation Project

Project Manager
M. VECCHIO, HDR

Designed
USACE

Checked
USACE

Drawn
USACE

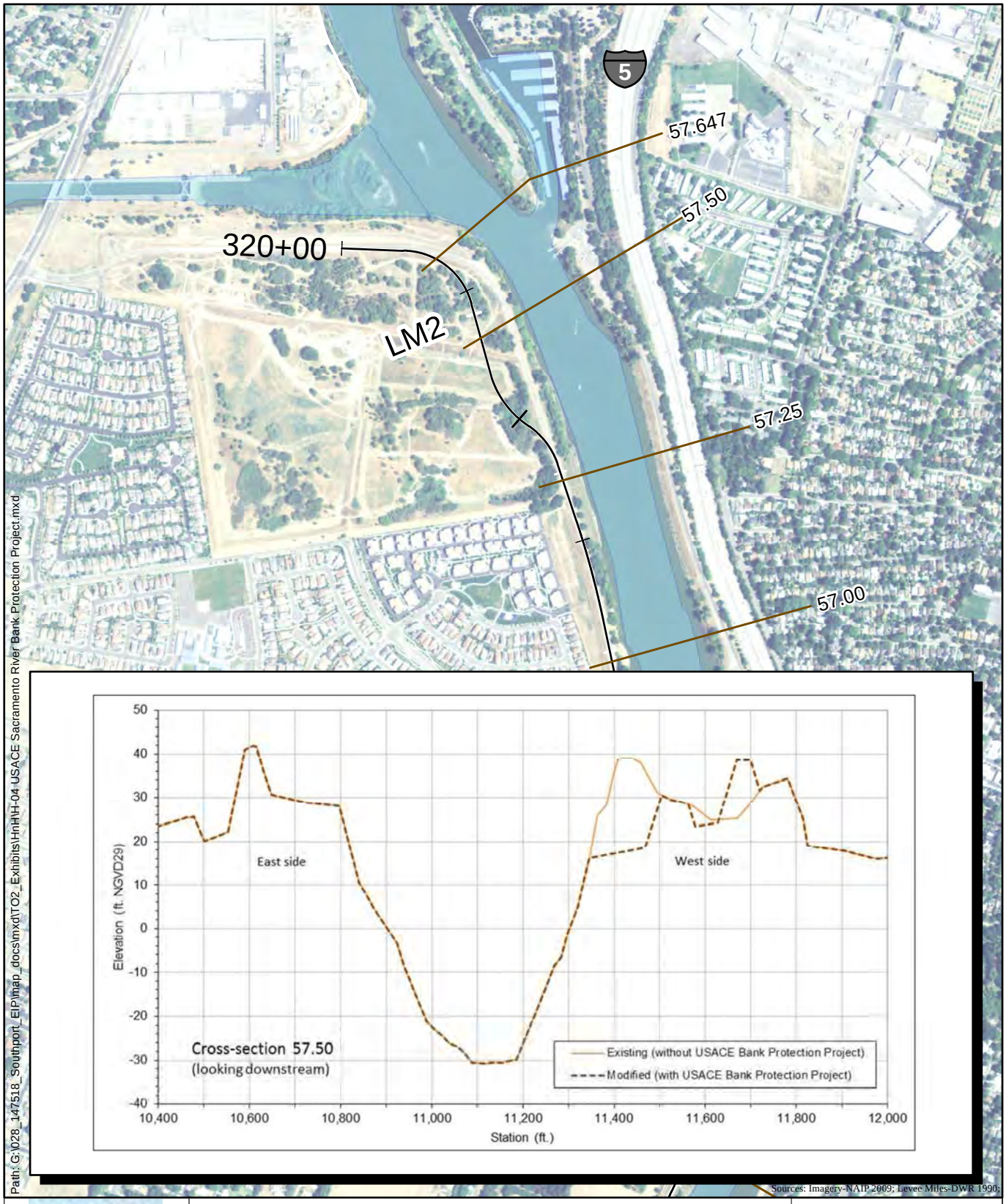
USACE RAS Model Extents

Exhibit H-3

Project Num: 453318-157784-028

May 2011

N
W E
S



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M. ARCHER, MBK

Checked
B. JONES, HDR

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A. ARNOLD, HDR

CROSS SECTIONS

PROJECT STATIONING

LM2 LEVEE MILES (DWR, 1990)

USACE Sacramento River Bank Protection Project

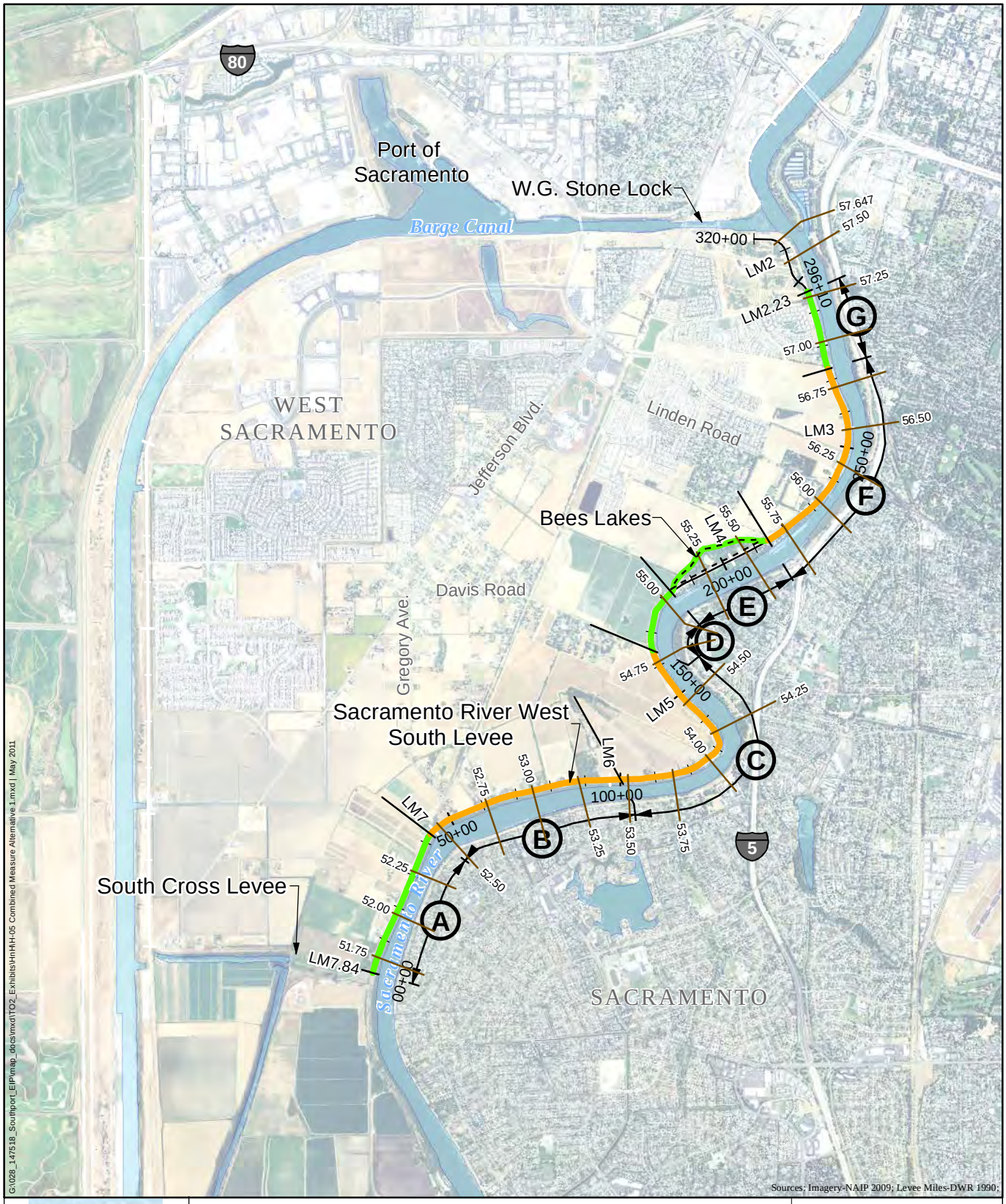
Exhibit H-4

Project Num: 453318-157784-028

May 2011

N
W E
S

0 500 1,000
Feet
1 in = 1,000 feet



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Levee Improvement Program Southport Early Implementation Project

Project Manager
M. VECCHIO, HDR

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G. PRESTON, MBK

Checked
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A. ARNOLD, HDR

CMA 1 CROSS-SECTIONS

ADJACENT LEVEE WITH BERM

ADJACENT LEVEE WITH CUTOFF WALL

A — COST EVALUATION SEGMENT

PROJECT STATIONING

LM2 LEVEE MILES (DWR, 1990)

Combined Measure Alternative 1 (Adjacent Levee)

Exhibit H-5

Project Num: 453318-157784-028

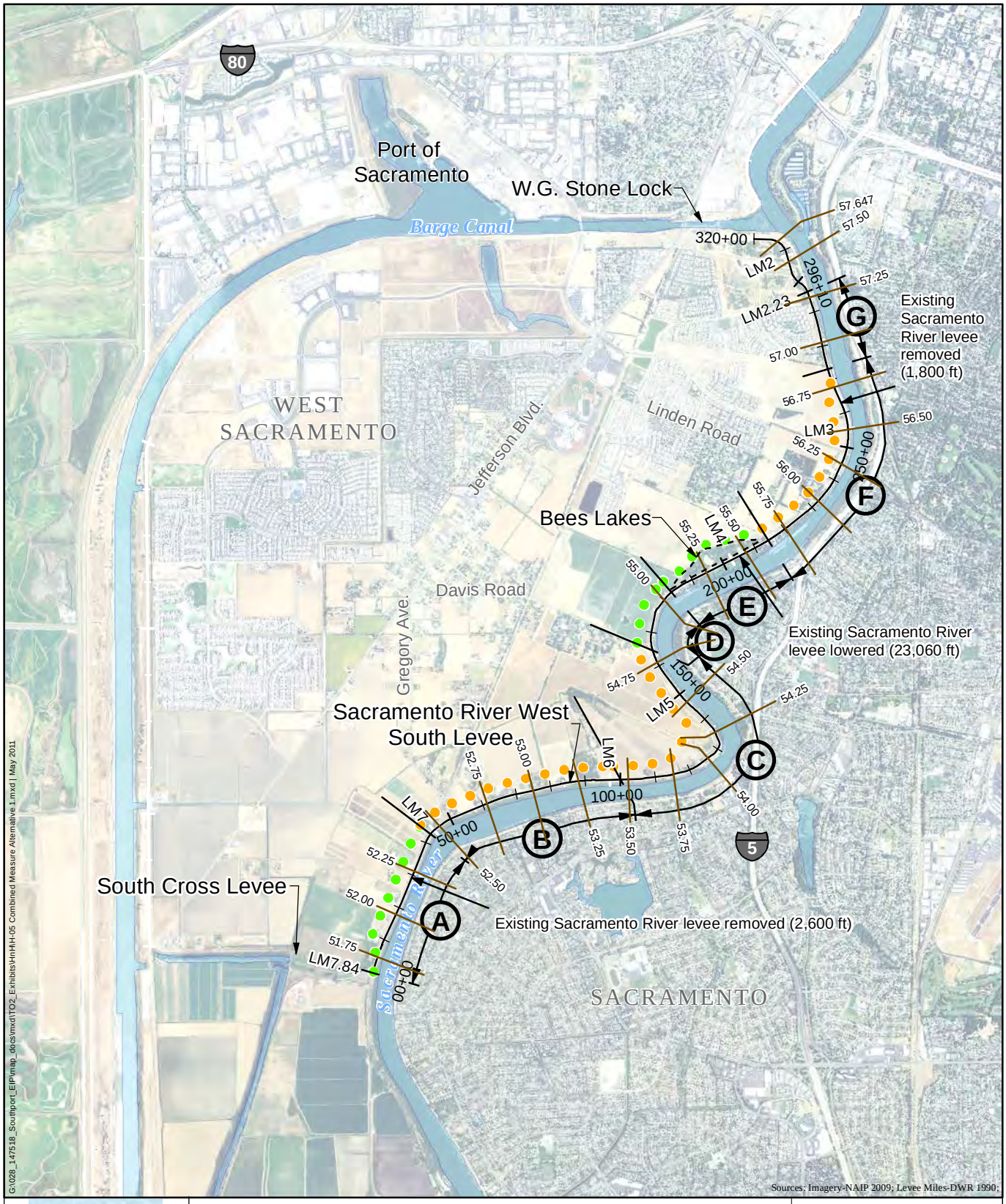
May 2011

N W E S

0 1,000 2,000 3,000 4,000

Feet

1 inch = 4,000 feet



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Project Manager
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A. ARNOLD, HDR

CMA 2 CROSS-SECTION

SETBACK LEVEE WITH BERM

SETBACK LEVEE WITH CUTOFF WALL

A — COST EVALUATION SEGMENT

PROJECT STATIONING

LM2 LEVEE MILES (DWR, 1990)

Combined Measure Alternative 2 (400' Setback Levee)

Exhibit H-6

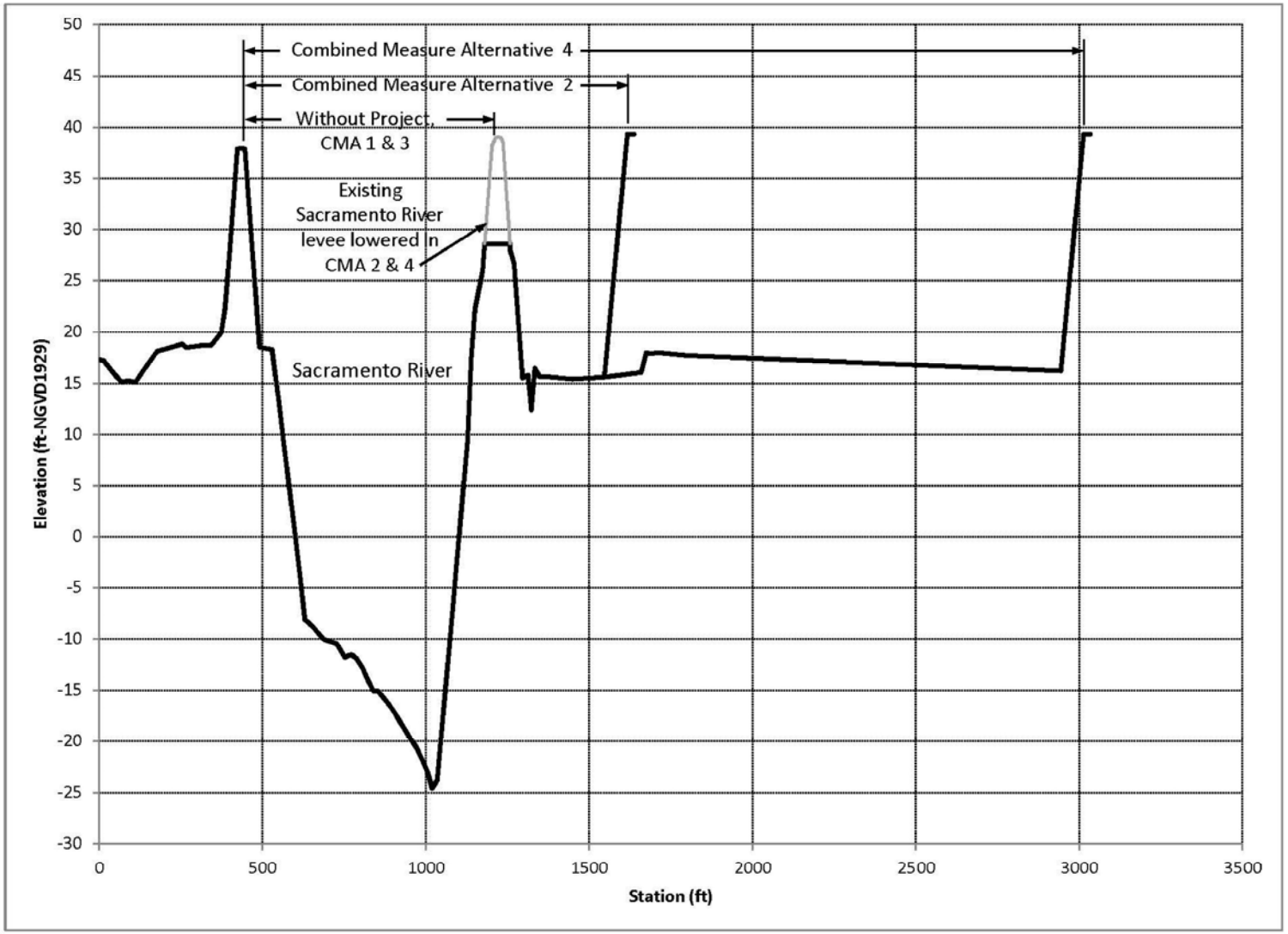
Project Num: 453318-157784-028

May 2011

N W E S

0 1,000 2,000 3,000 4,000

Feet
1 inch = 4,000 feet



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Levee Improvement Program
Southport Early
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Project Manager
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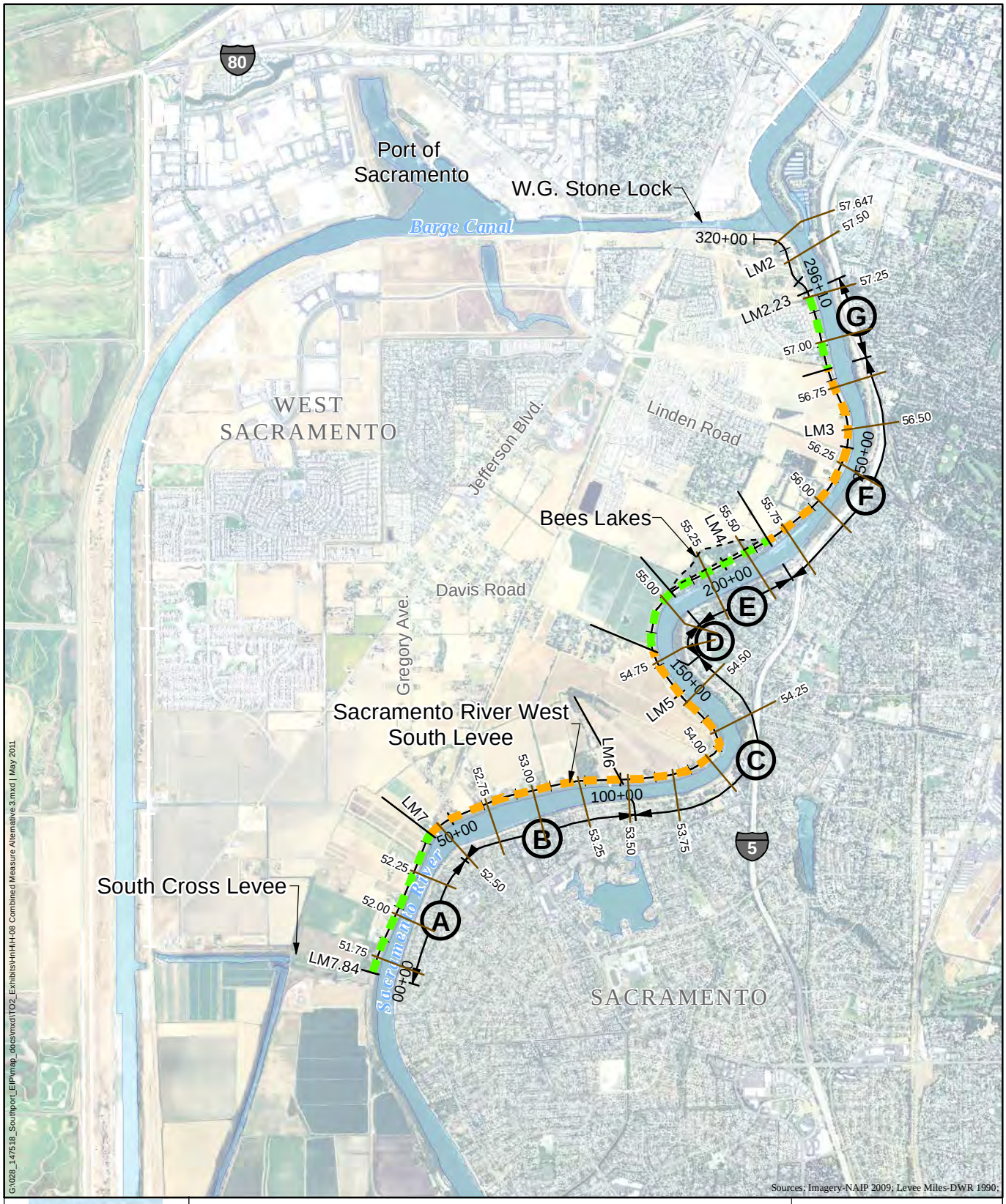
C. PLOTTS, HDR

Typical Cross-Sections, Levee Setbacks

Exhibit H-7

Project Num: 453318-147518-028

May 2011



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M. VECCHIO, HDR

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A. ARNOLD, HDR

CMA 3 CROSS-SECTIONS
SLOPE FLATTENING WITH BERM
SLOPE FLATTENING WITH CUTOFF WALL

A — COST EVALUATION SEGMENT

PROJECT STATIONING

LM2 LEVEE MILES (DWR, 1990)

Combined Measure Alternative 3 (In-Place Modifications)

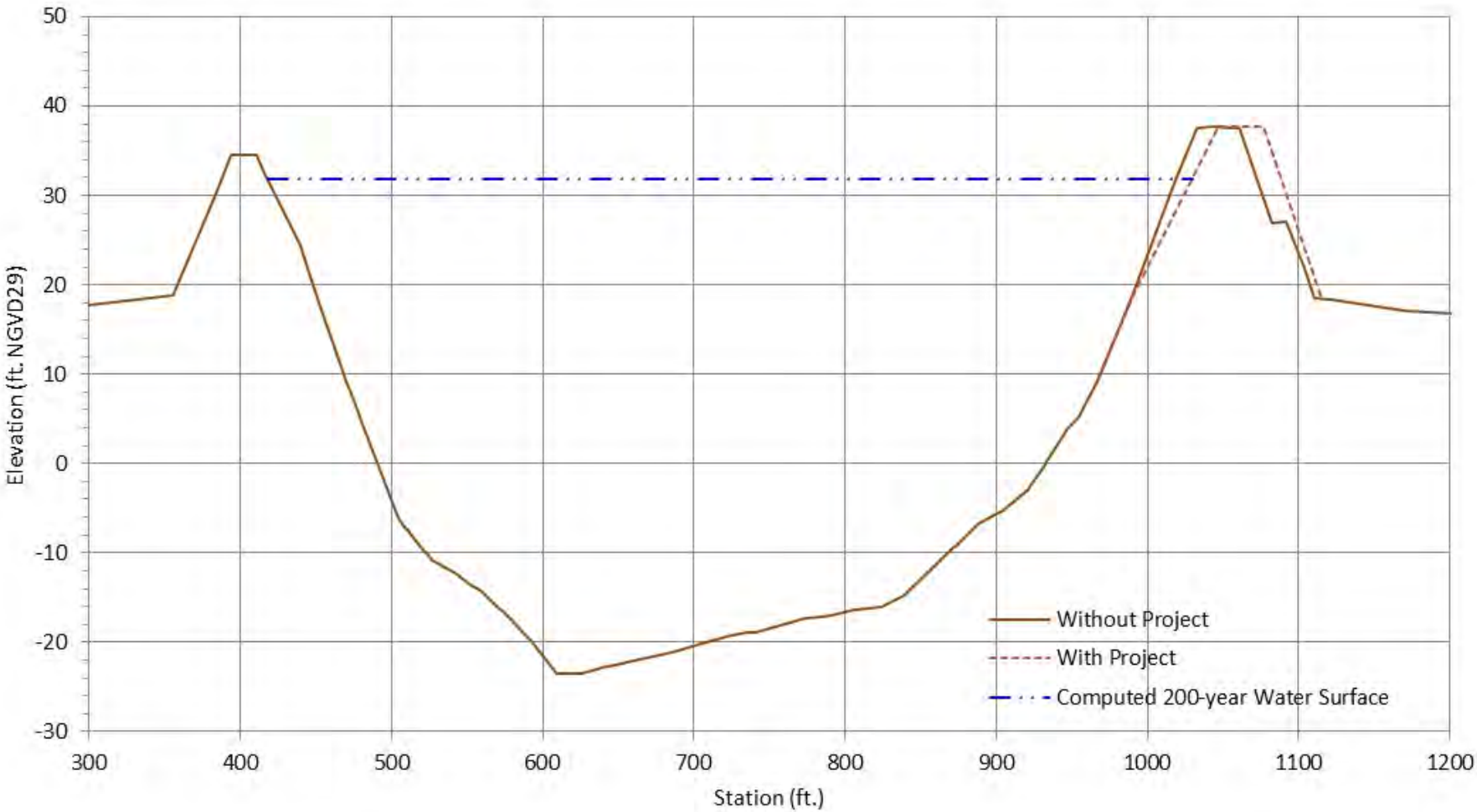
Exhibit H-8

Project Num: 453318-157784-028

May 2011

N W E S

0 1,000 2,000 3,000 4,000
Feet
1 inch = 4,000 feet



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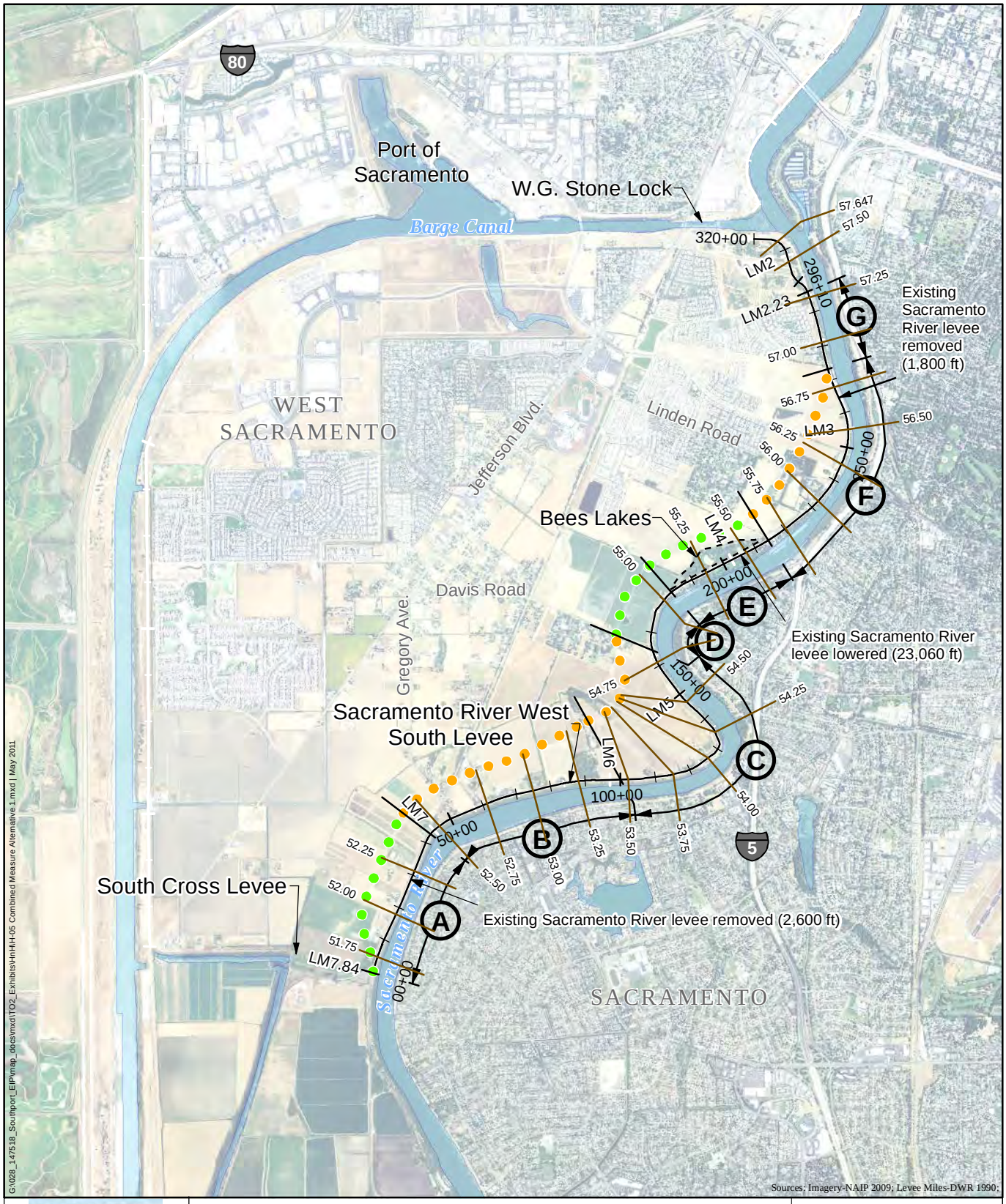
C. PLOTTS, HDR

Typical Cross-Sections, CMA3

Exhibit H-9

Project Num: 453318-147518-028

May 2011



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M. VECCHIO, HDR

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A. ARNOLD, HDR

CMA 4 CROSS-SECTION

SETBACK LEVEE WITH BERM

SETBACK LEVEE WITH CUTOFF WALL

A — COST EVALUATION SEGMENT

PROJECT STATIONING

LM2 LEVEE MILES (DWR, 1990)

Combined Measure Alternative 4 - (1,000' Setback Alternative)

Exhibit H-10

Project Num: 453318-157784-028

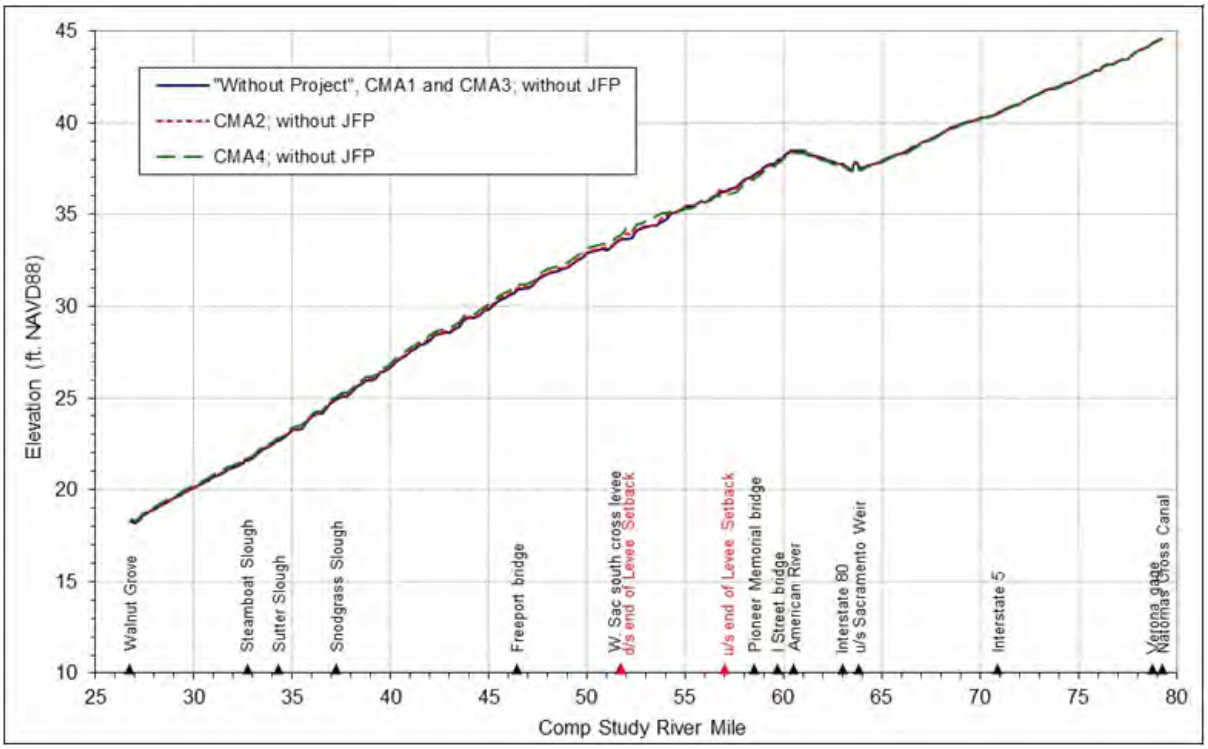
May 2011

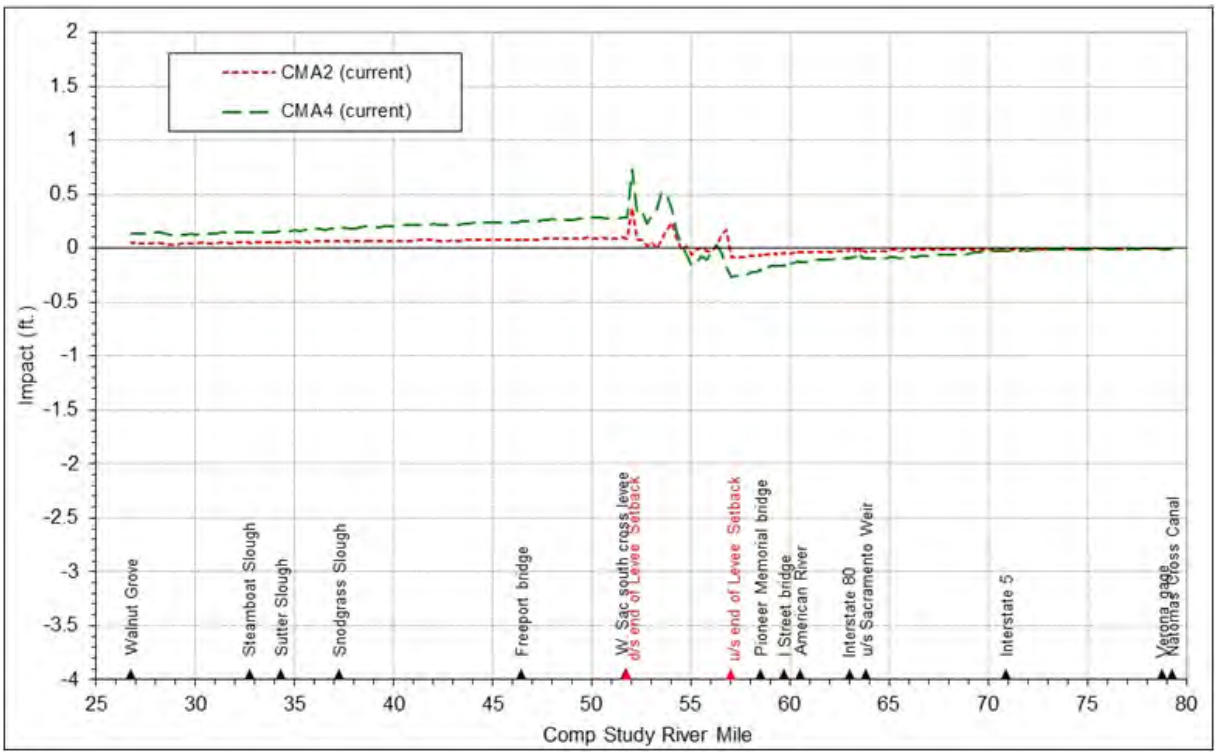
N W E S

0 1,000 2,000 3,000 4,000

Feet

1 inch = 4,000 feet





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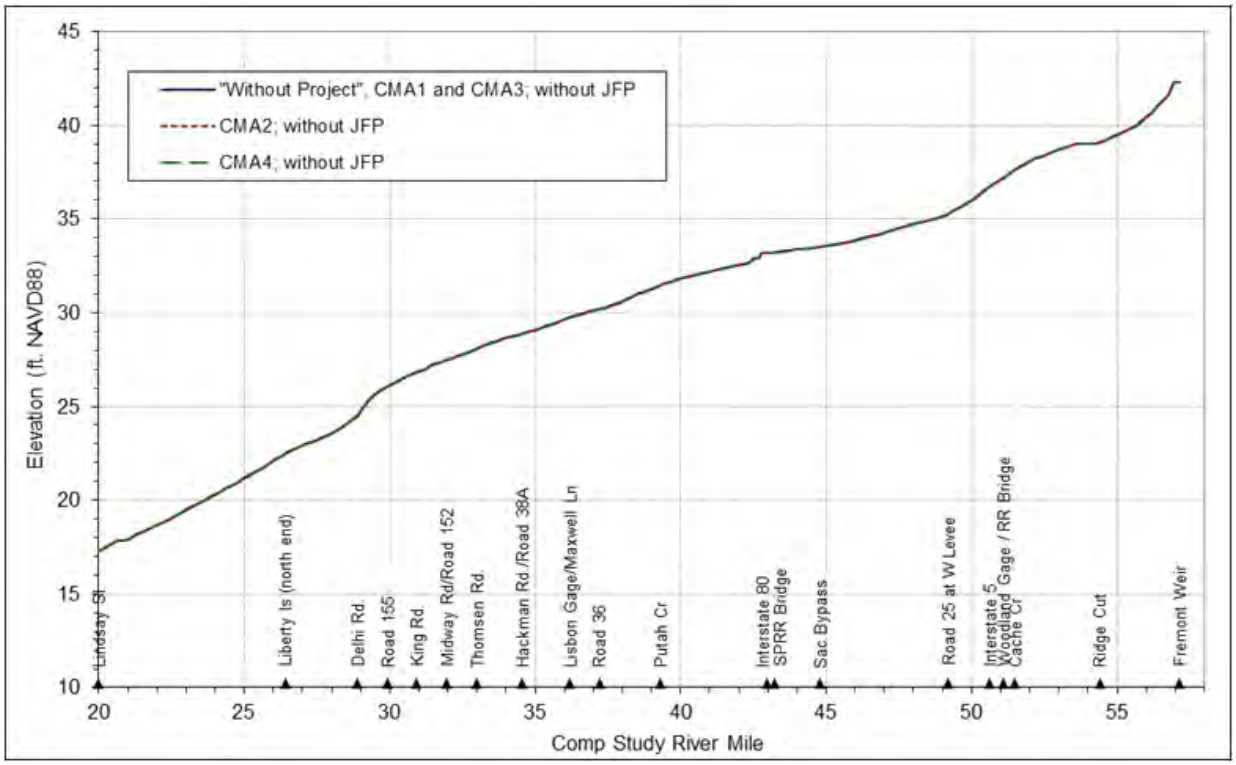
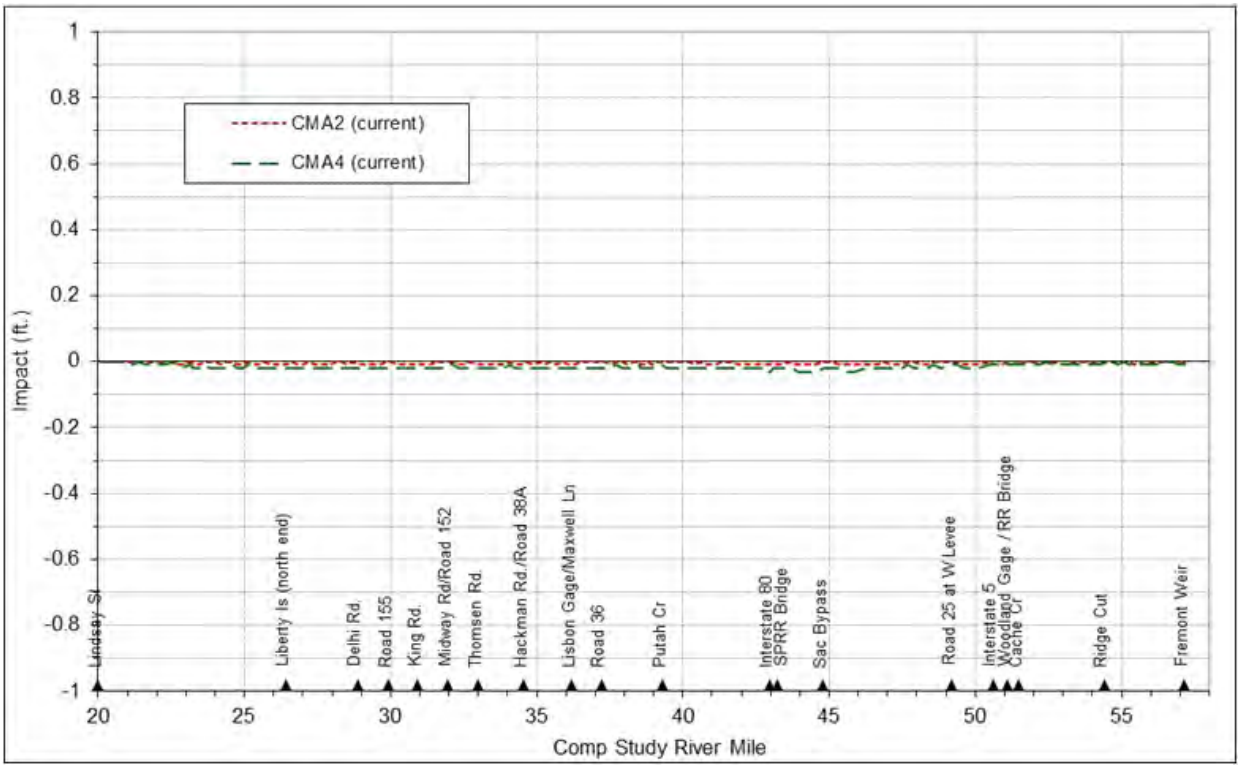
Maximum WSE and Impact Profiles, Sacramento River Current Conditions

Exhibit H-11

Project Num: 453318-157784-028

May 2011





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Levee Improvement Program Southport Early Implementation Project

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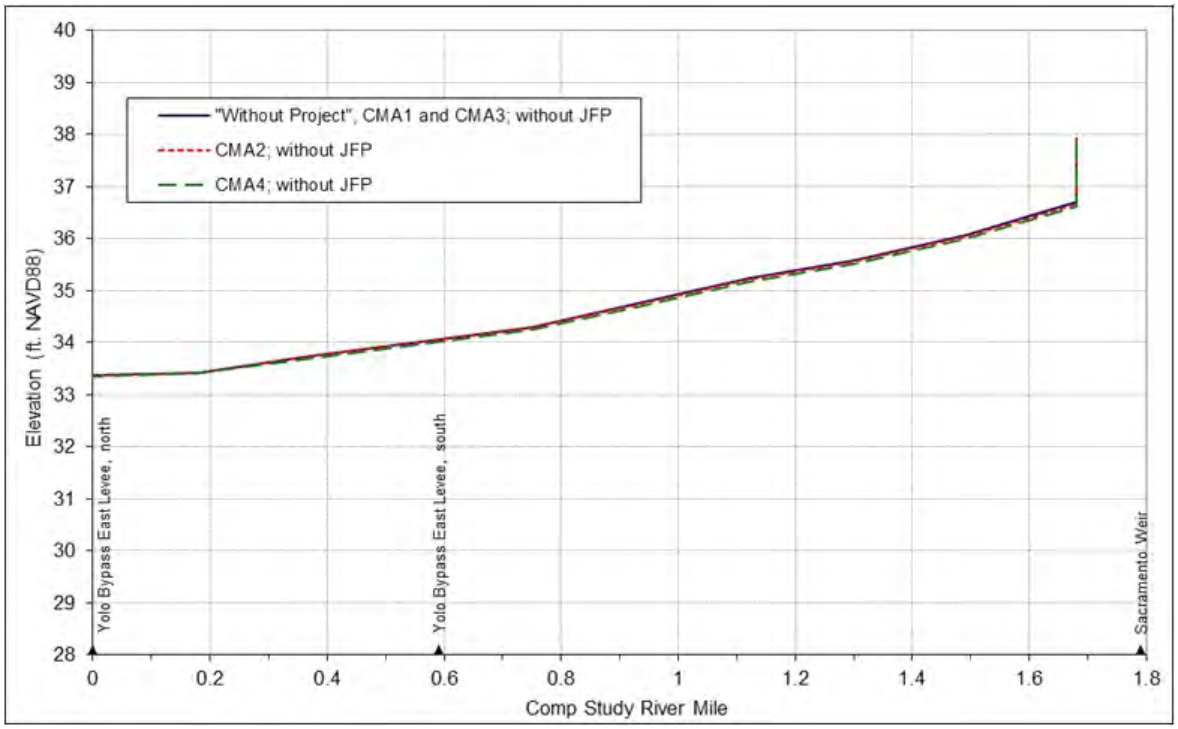
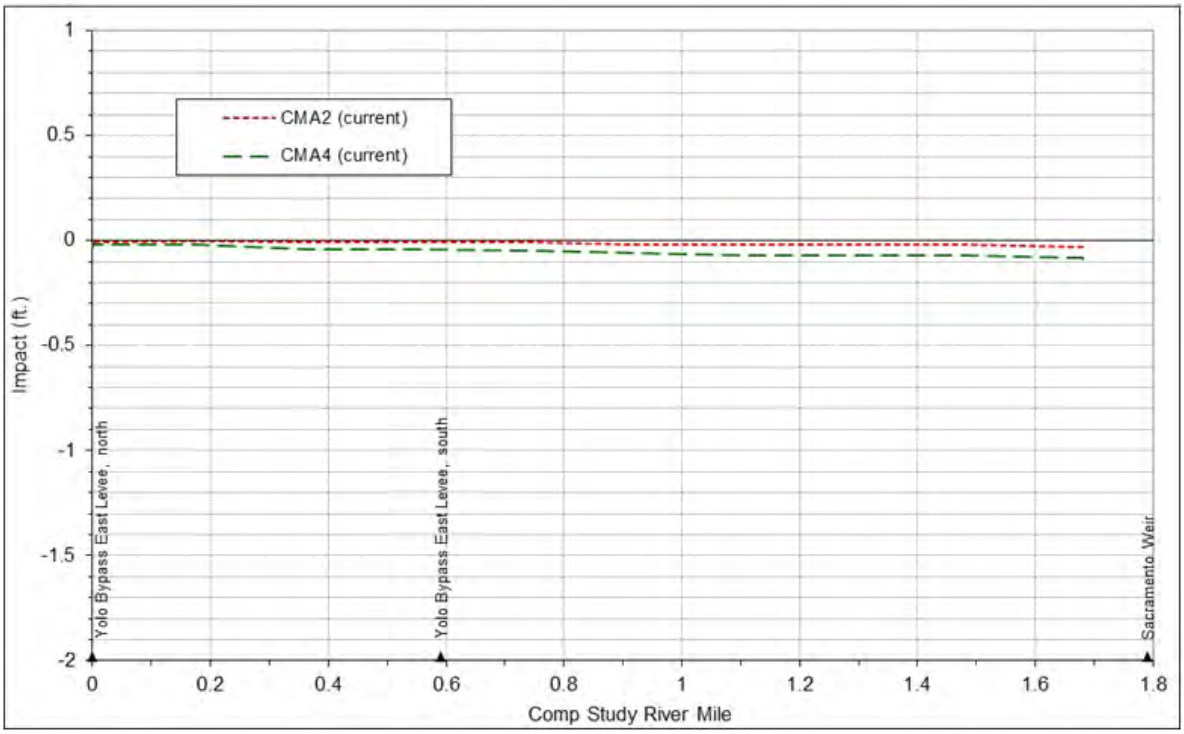
Maximum WSE and Impact Profiles, Yolo Bypass Current Conditions

Exhibit H-12

Project Num: 453318-157784-028

May 2011





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Levee Improvement Program Southport Early Implementation Project

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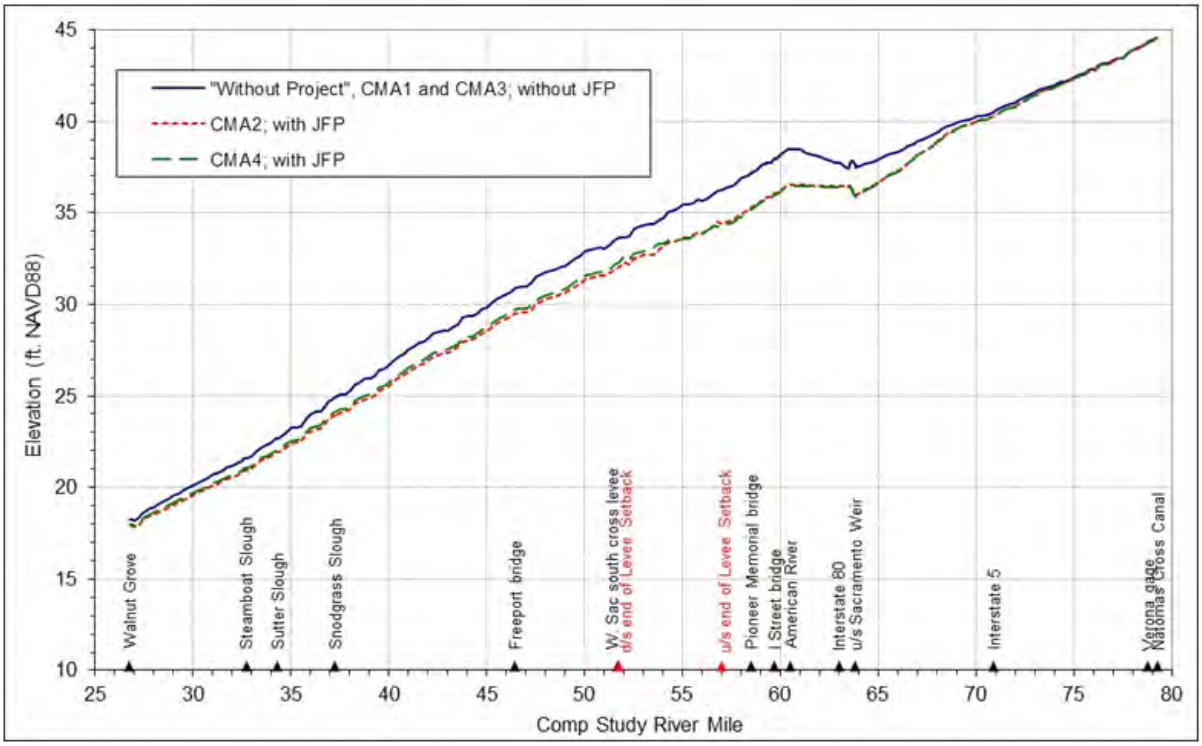
C. PLOTTS, HDR

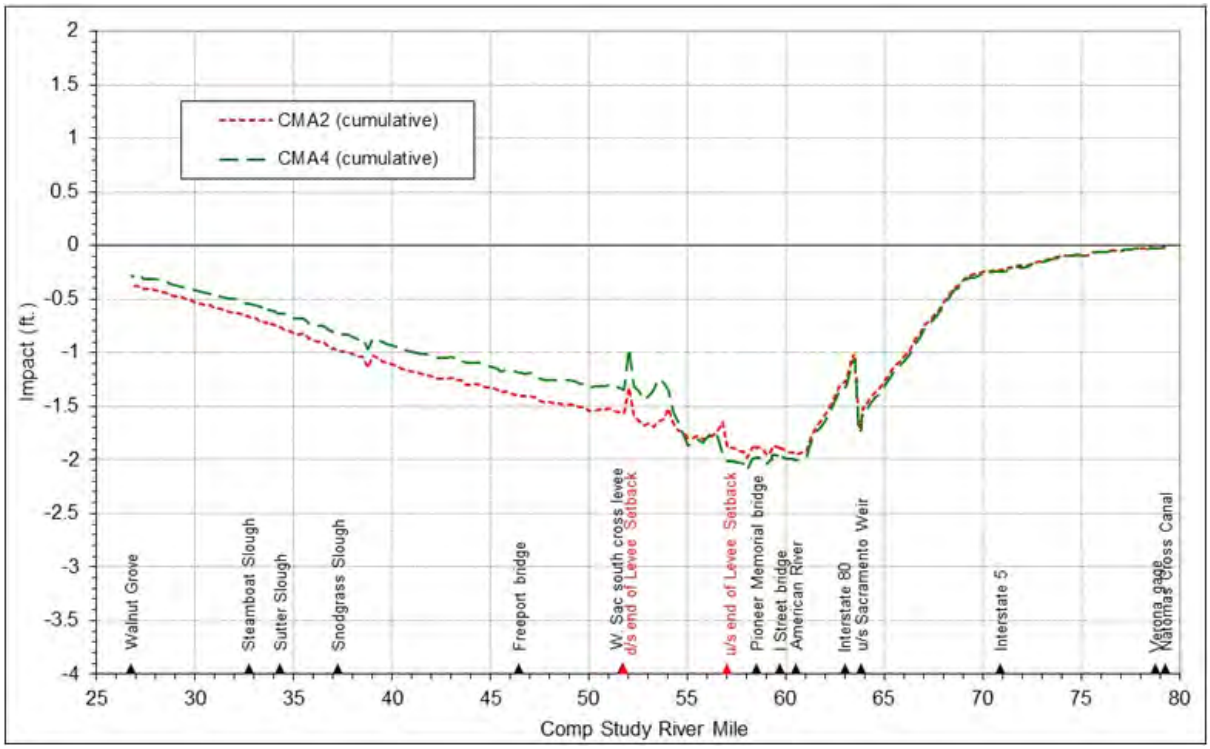
Maximum WSE and Impact Profiles, Sacramento Bypass Current Conditions

Exhibit H-13

Project Num: 453318-157784-028

May 2011





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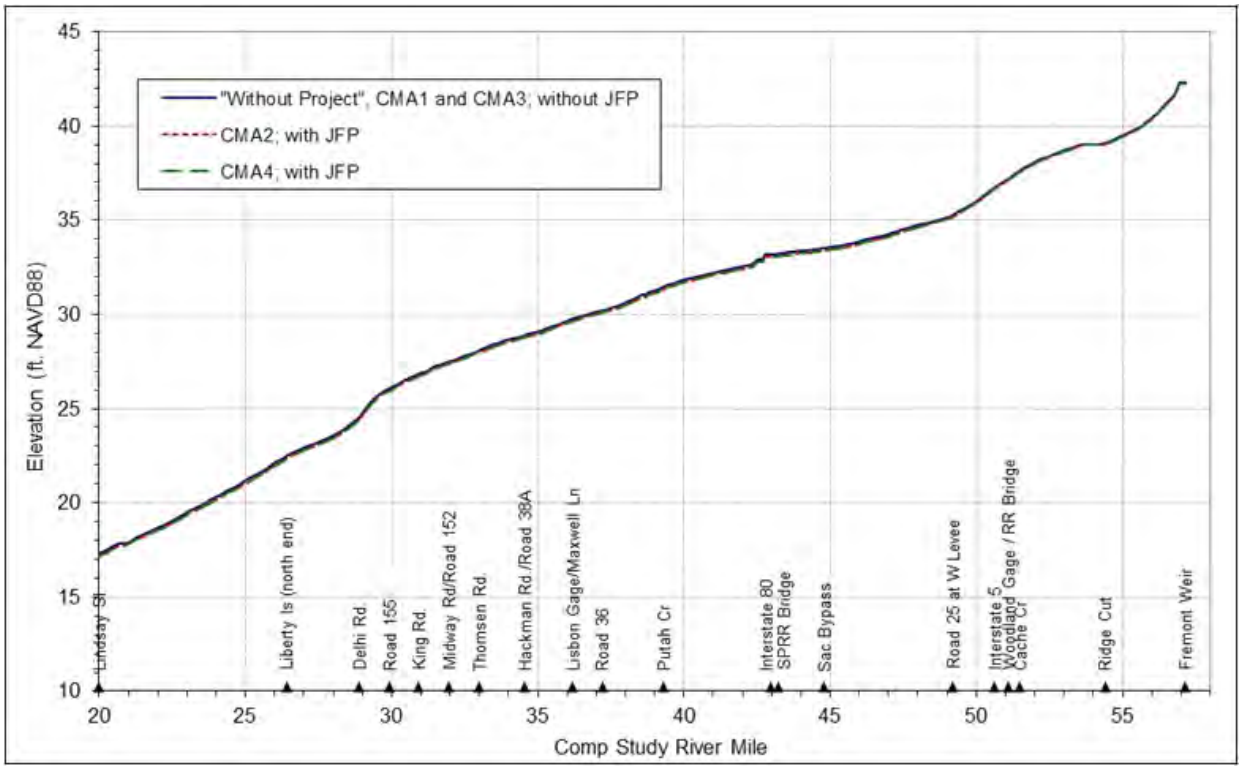
C. PLOTTS, HDR

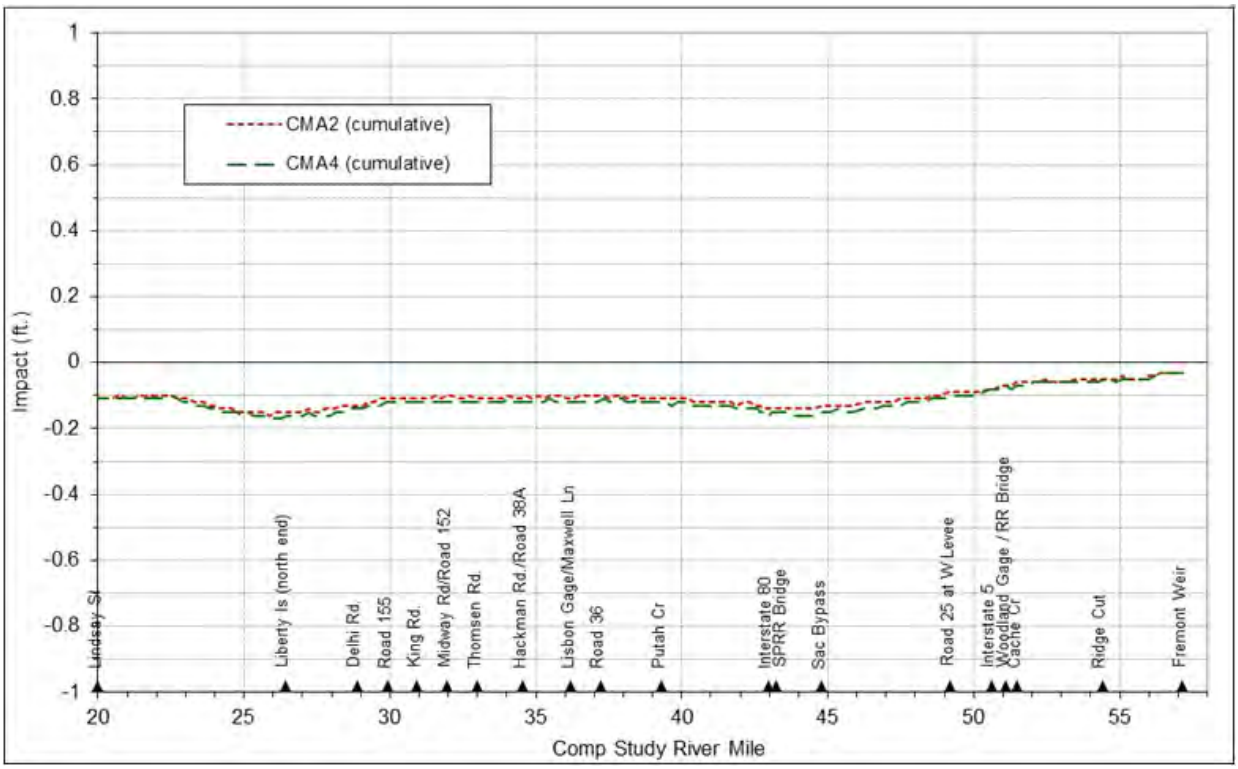
Maximum WSE and Impact Profiles, Sacramento River Cumulative Analysis

Exhibit H-14

Project Num: 453318-157784-028

May 2011





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Levee Improvement Program Southport Early Implementation Project

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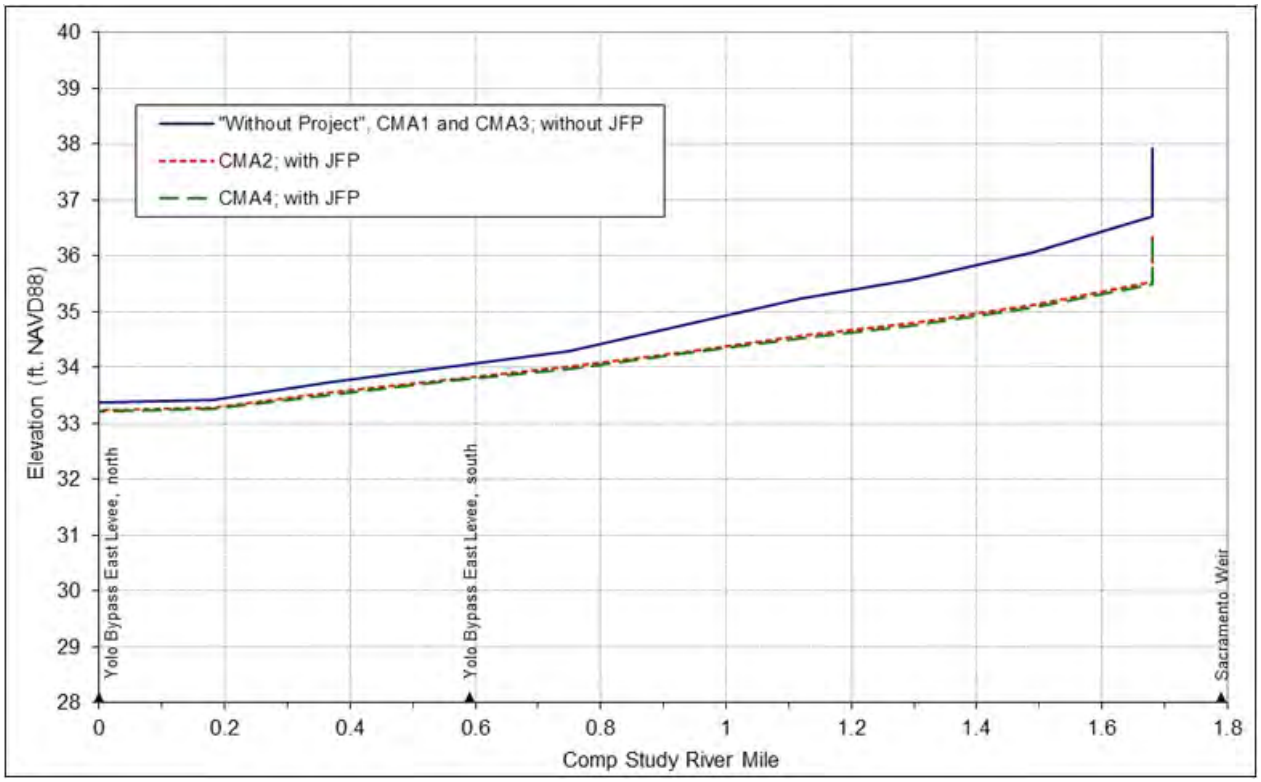
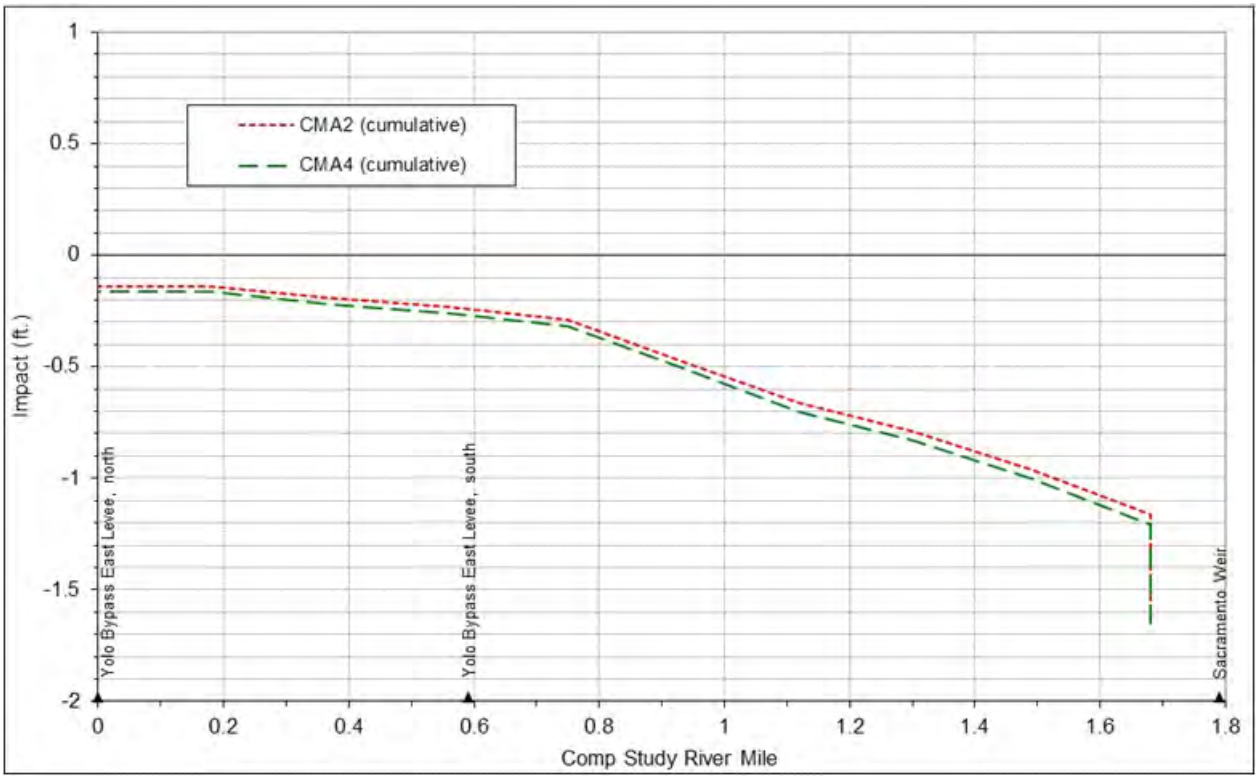
Maximum WSE and Impact Profiles, Yolo Bypass Cumulative Analysis

Exhibit H-15

Project Num: 453318-157784-028

May 2011





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Levee Improvement Program Southport Early Implementation Project

Project Manager
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M. ARCHER, MBK

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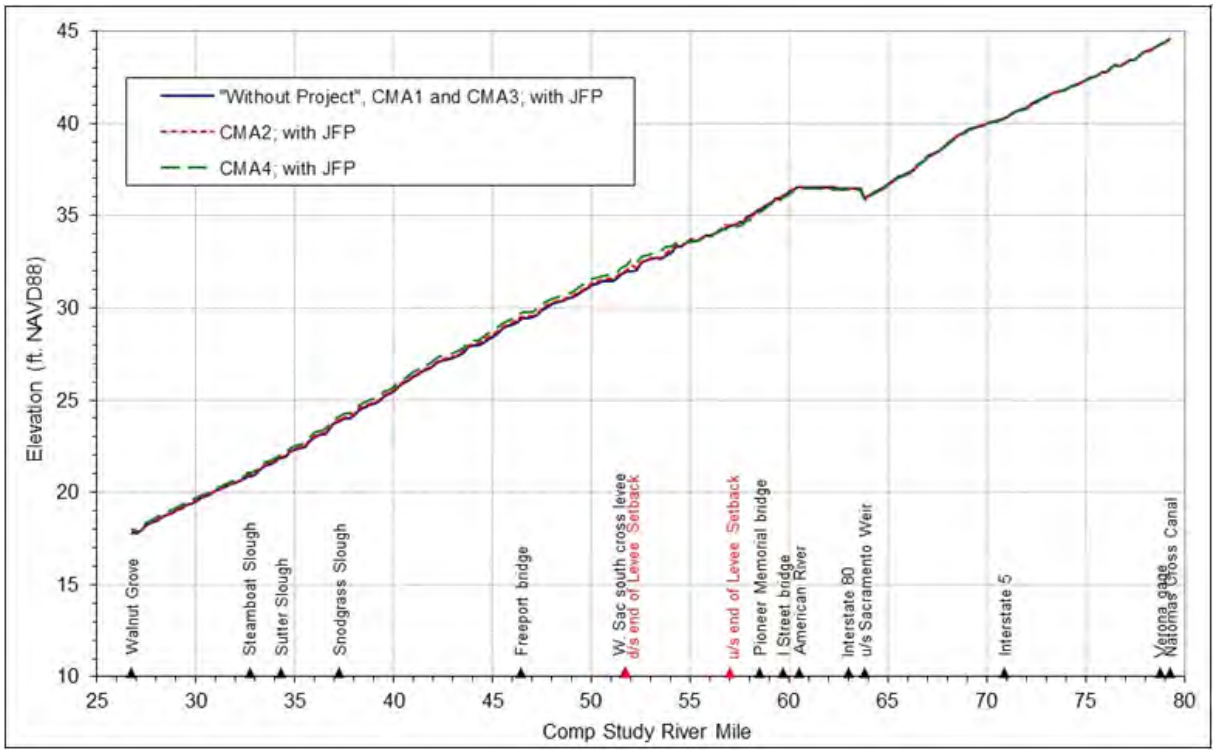
C. PLOTTS, HDR

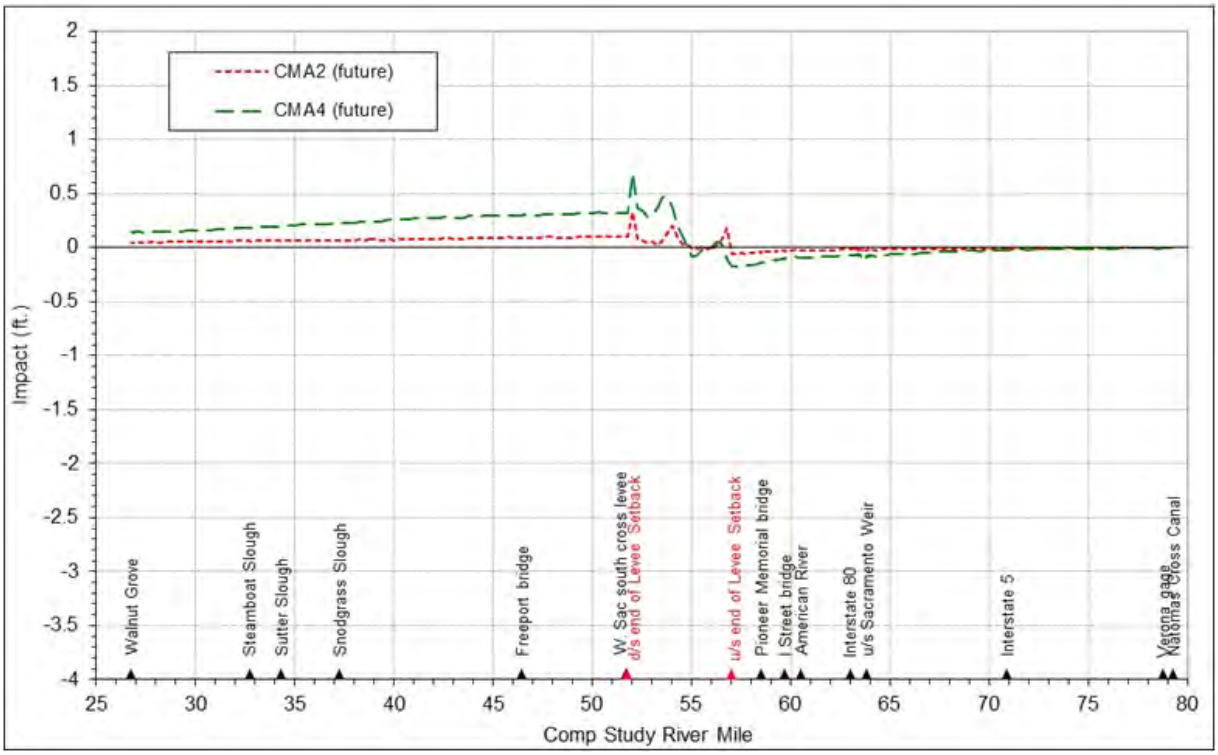
Maximum WSE and Impact Profiles, Sacramento Bypass Cumulative Analysis

Exhibit H-16

Project Num: 453318-157784-028

May 2011





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Levee Improvement Program Southport Early Implementation Project

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Maximum WSE and Impact Profiles, Sacramento River Future Conditions

Exhibit H-17

Project Num: 453318-157784-028

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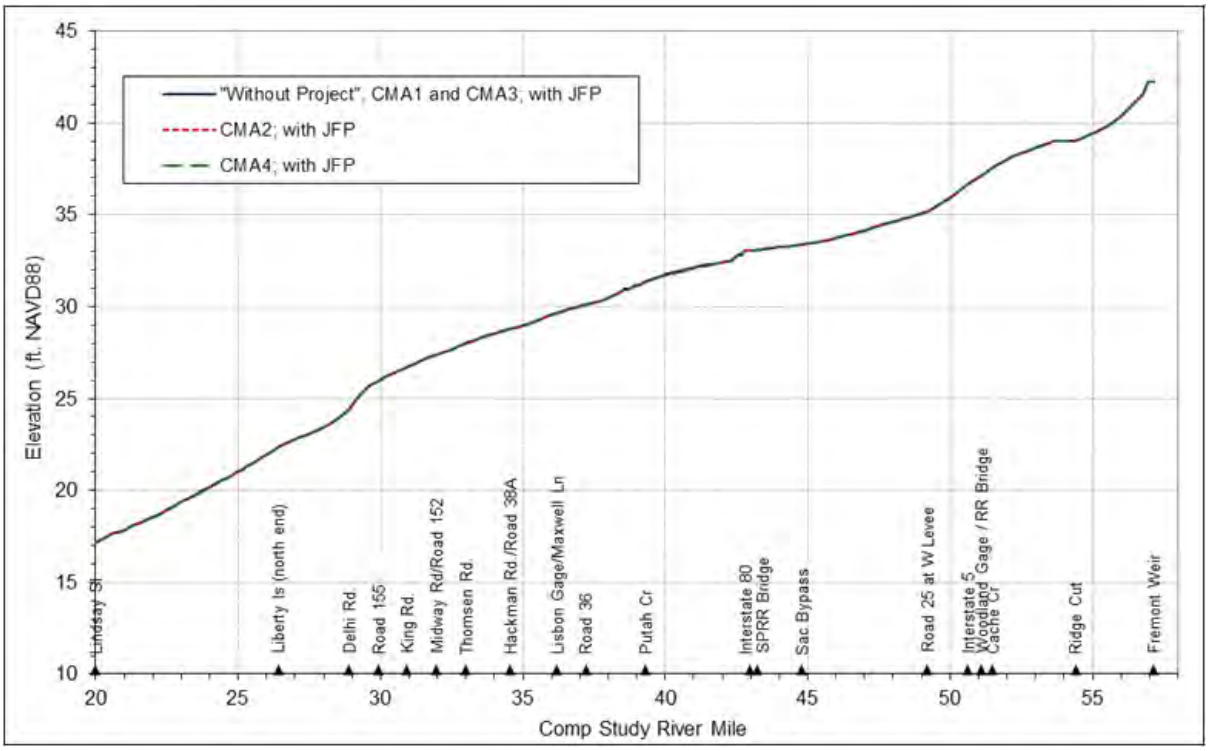

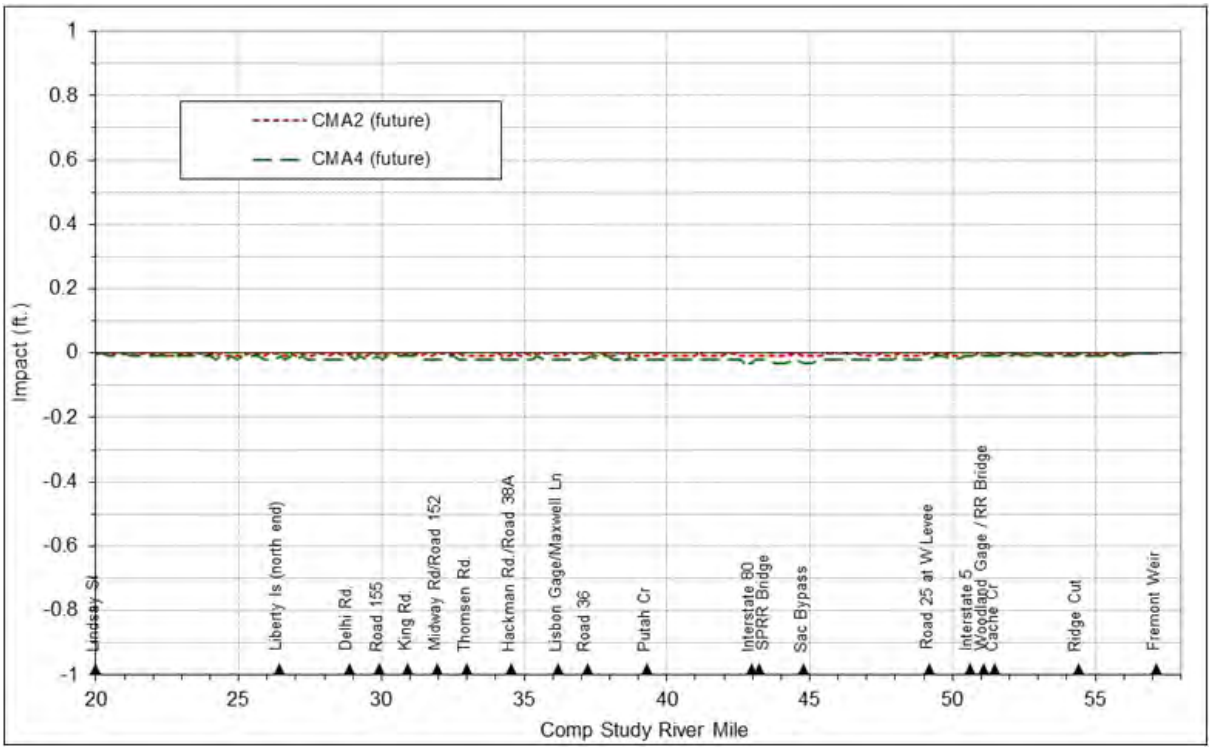

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Levee Improvement Program Southport Early Implementation Project

Project Manager
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B. JONES, HDR

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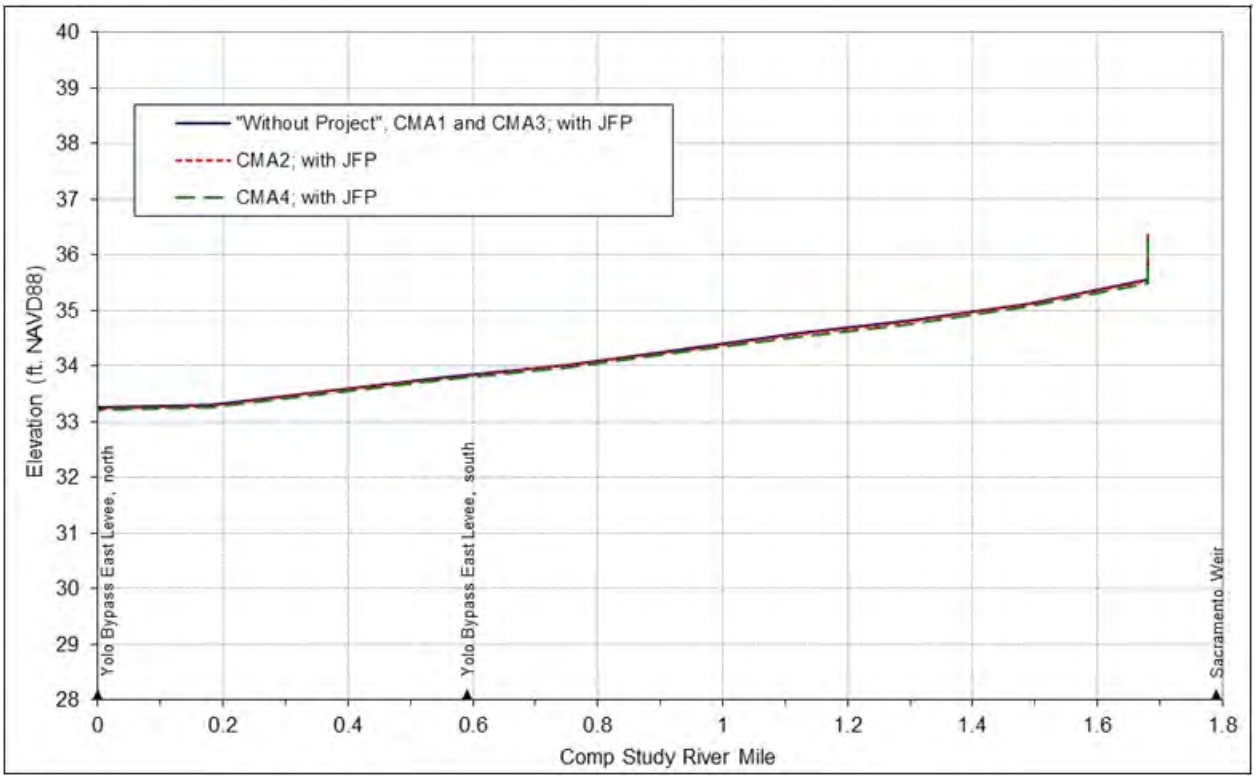
C. PLOTTS, HDR

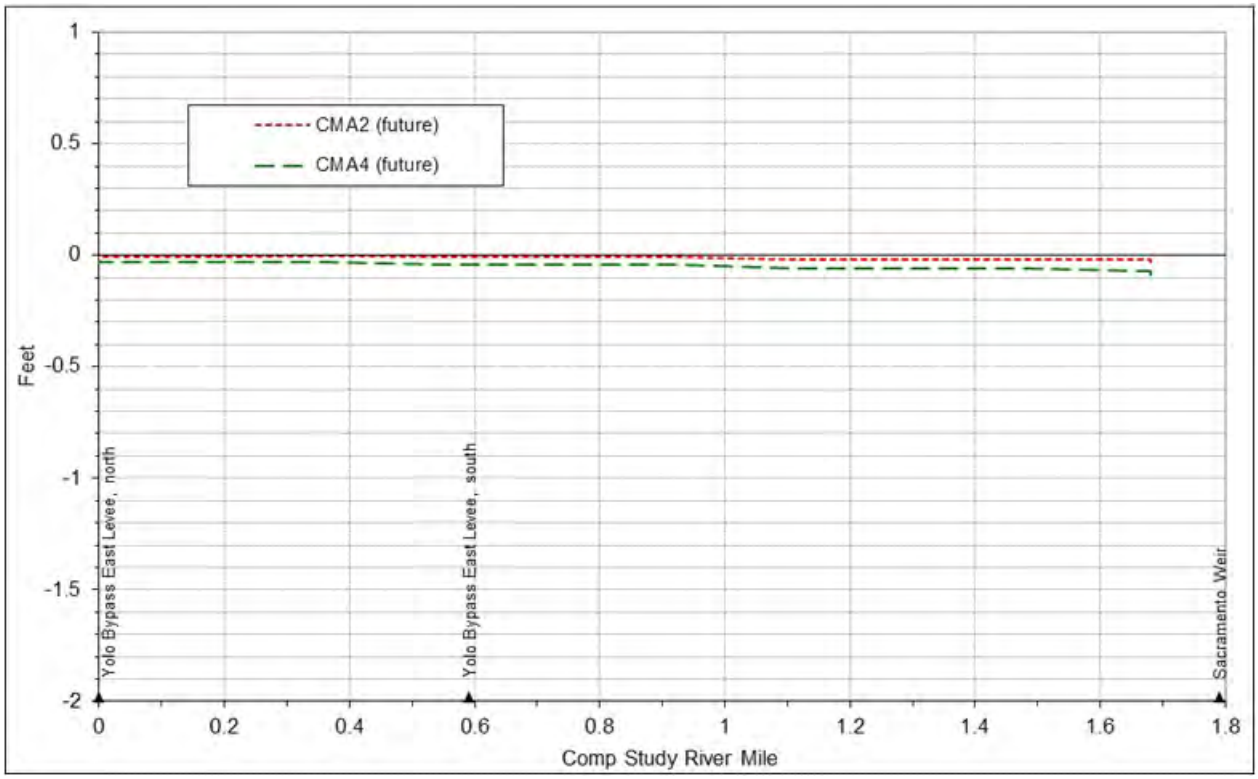
Maximum WSE and Impact Profiles, Yolo Bypass Future Conditions

Exhibit H-18

Project Num: 453318-157784-028

May 2011





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Levee Improvement Program Southport Early Implementation Project

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C. PLOTTS, HDR

Maximum WSE and Impact Profiles, Sacramento Bypass Future Conditions

Exhibit H-19

Project Num: 453318-157784-028

May 2011

ATTACHMENT A

Water Resources • Flood Control • Water Rights

TECHNICAL MEMORANDUM

DATE: May 13, 2011

SUBJECT: USACE Sacramento River Basin HEC-RAS Model Calibration Refinement for West Sacramento Analyses

Prepared by: George Preston, P.E.

Reviewed by: Michael Archer, P.E.

The U.S. Army Corps of Engineers (USACE) developed a HEC-RAS model of the Sacramento River Basin (Model) (USACE 2010). Release 2 of the Model was made available by USACE in December 2010. The USACE release memo for the Model is provided in Attachment 1. The Model was calibrated to the January 1997 flood event. The extents of the Model are shown in Figure 1.

MBK Engineers (MBK) reviewed the Model for application with West Sacramento hydraulic analyses. The Model, as provided by the USACE, was developed and run using HEC-RAS 4.0. The MBK review and analysis were performed using HEC-RAS 4.1. Prior to the calibration evaluation, a HEC-RAS computational review was performed comparing computed model results from HEC-RAS 4.0 and 4.1, which showed essentially no differences.

Maximum water surface elevations computed with the Model compared well with observed data for the Sacramento River in the vicinity of West Sacramento (see Figure 2), while maximum water surfaces in the Yolo Bypass were overestimated, as shown in Figure 3. A review of peak

flows, observed and computed, revealed the Model had a reasonable peak flow in the Sacramento River downstream of the Natomas Cross Canal, but that the peak flow in the Yolo Bypass was significantly overestimated, as shown in Table 1.

Table 1. USACE Model Peak Flow Comparison for Latitude of Verona

Gage Name	Gage ID	Observed Peak Flow (cfs)	Computed Peak Flow (cfs)	Percent Difference
Sacramento River at Verona	11425500 (USGS)	102,000	104,300	+2.3%
Yolo Bypass near Woodland	11453000 (USGS)	357,000	404,200	+13.2%

Based on a review of the Model input flows for the January 1997 calibration event, it was concluded that the input flow for the Sutter Bypass was the source of the most uncertainty. In order to improve the comparison of observed and computed flow values at the latitude of Verona, the model input flow for the Sutter Bypass was reduced 38%.

To improve the calibration of the Fremont Weir-Sacramento River flow split, MBK modified the Fremont Weir in the Model by changing the weir shape from “Broad Crested” to “Sharp Crested” and increased the weir coefficient from 1.4 to 1.8. Additionally, the Tisdale Weir in the model was modified by changing the weir shape from “Broad Crested” to “Sharp Crested” and the weir coefficient was increased from 3.0 to 3.2.

The following table and figures present computed model results from the refined model. Peak flows at the latitude of Verona are summarized in Table 2. Maximum water surface profiles are shown in Figures 4 and 5. Stage and flow hydrographs along with observed data in the vicinity of West Sacramento are shown in Figures 6 through 13.

Table 2. MBK Refined Model Peak Flow Comparison for Latitude of Verona

Gage Name	Gage ID	Observed Peak Flow (cfs)	Computed Peak Flow (cfs)	Percent Difference
Sacramento River at Verona	11425500 (USGS)	102,000	103,100	+1.1%
Yolo Bypass near Woodland	11453000 (USGS)	357,000	356,900	+0.0%

References

Unites States Army Corps of Engineers (USACE). Post-Authorization Change Report And Interim General Reevaluation Report, American River Watershed Common Features Project, Appendix C - Hydraulic Technical Documentation, August 2010.

Figures

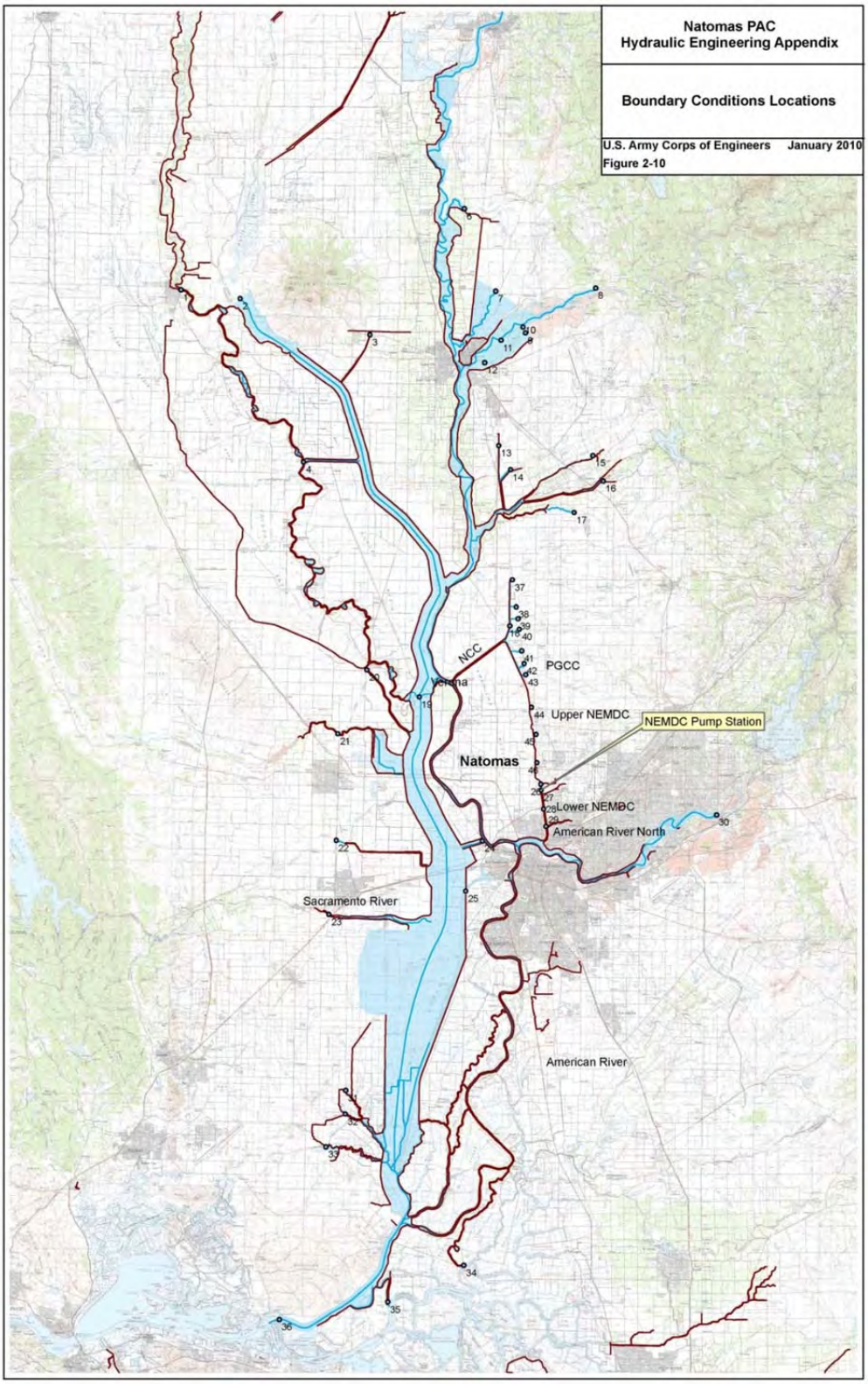

Figure 1. Model Extents (Source: USACE)

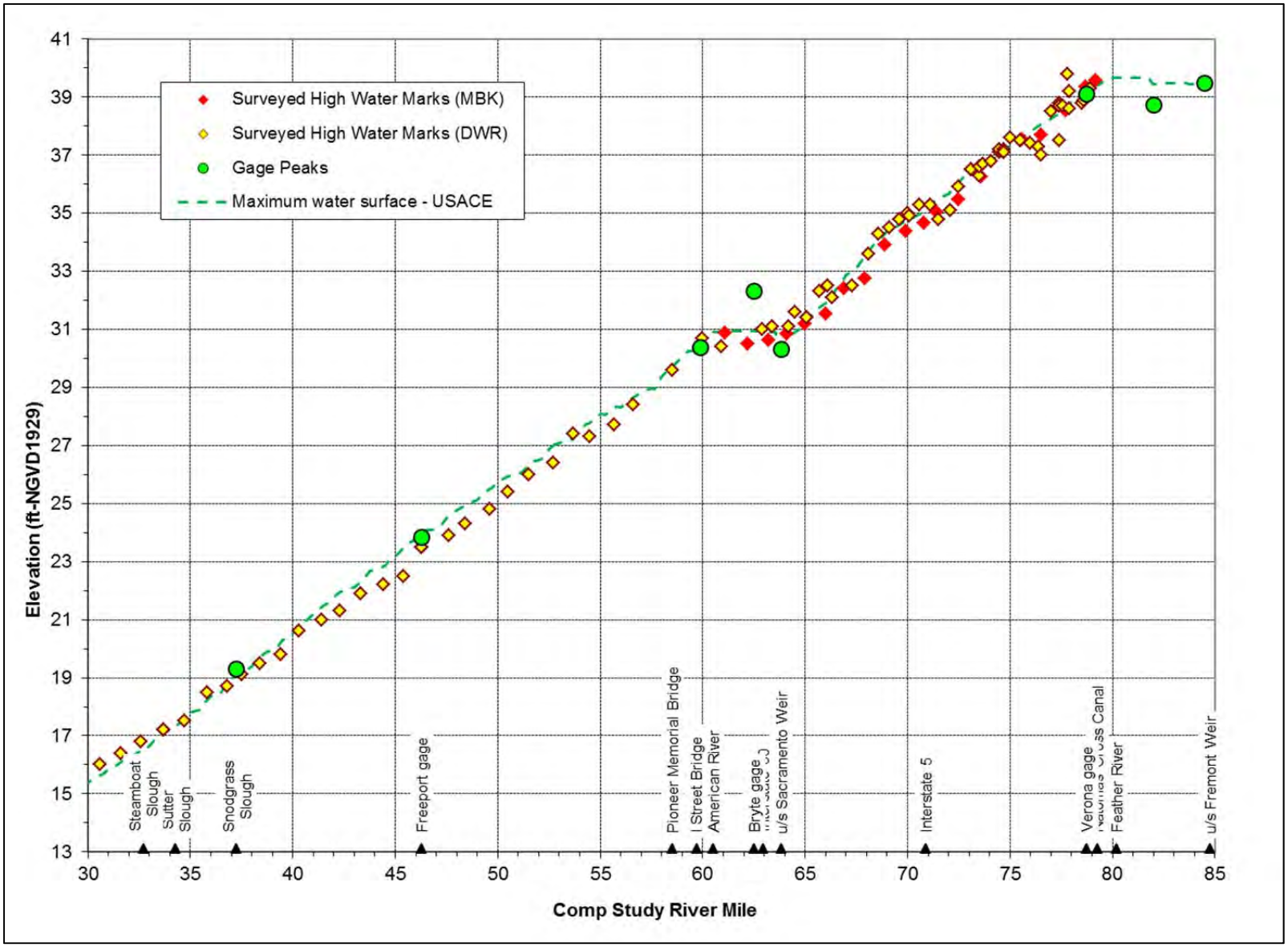

Figure 2. Sacramento River Maximum Water Surface Profile, January 1997 Calibration Simulation, USACE

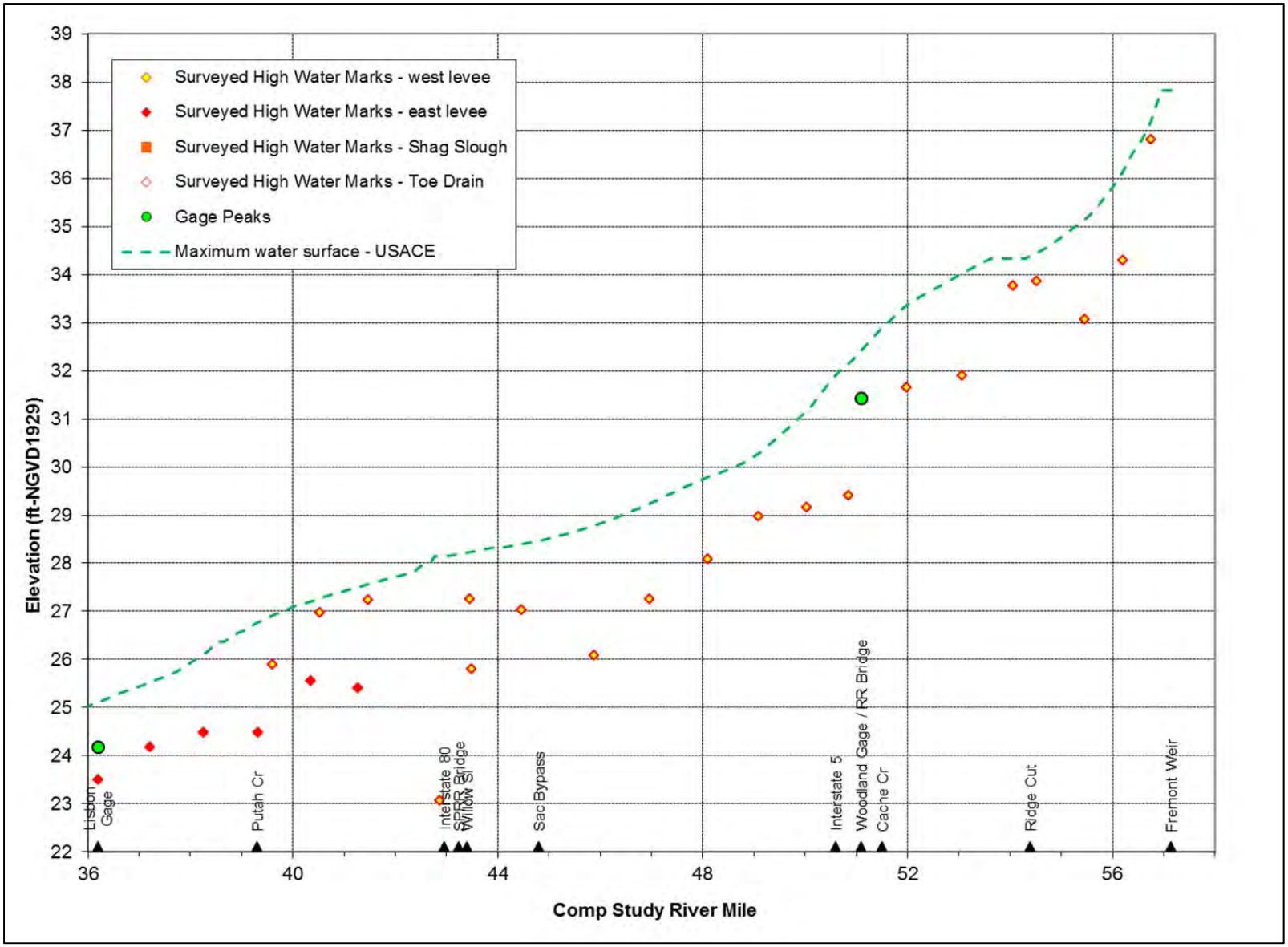

Figure 3. Yolo Bypass Maximum Water Surface Profile, January 1997 Calibration Simulation, USACE

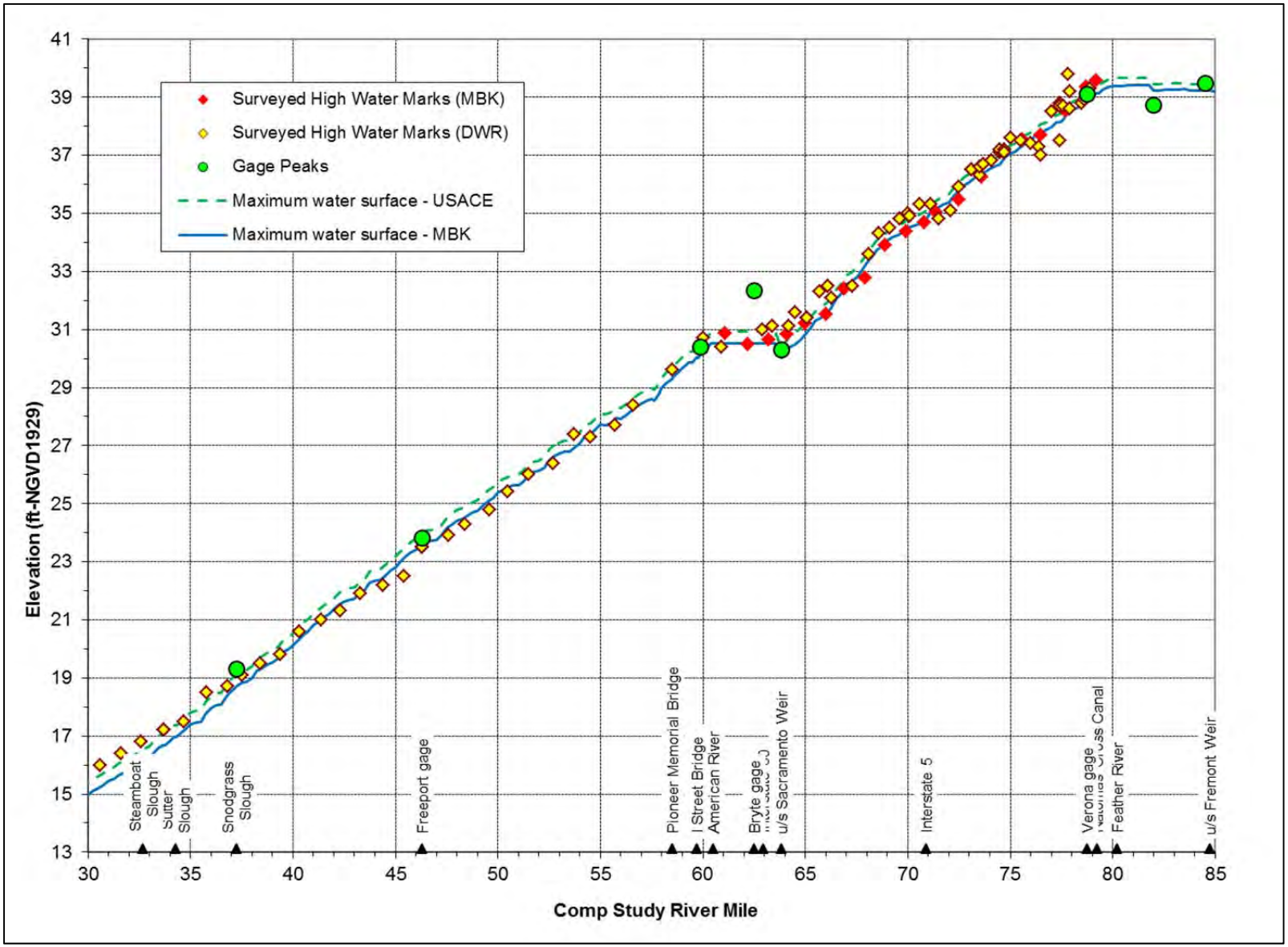

Figure 4. Sacramento River Maximum Water Surface Profile, January 1997 Calibration Simulation

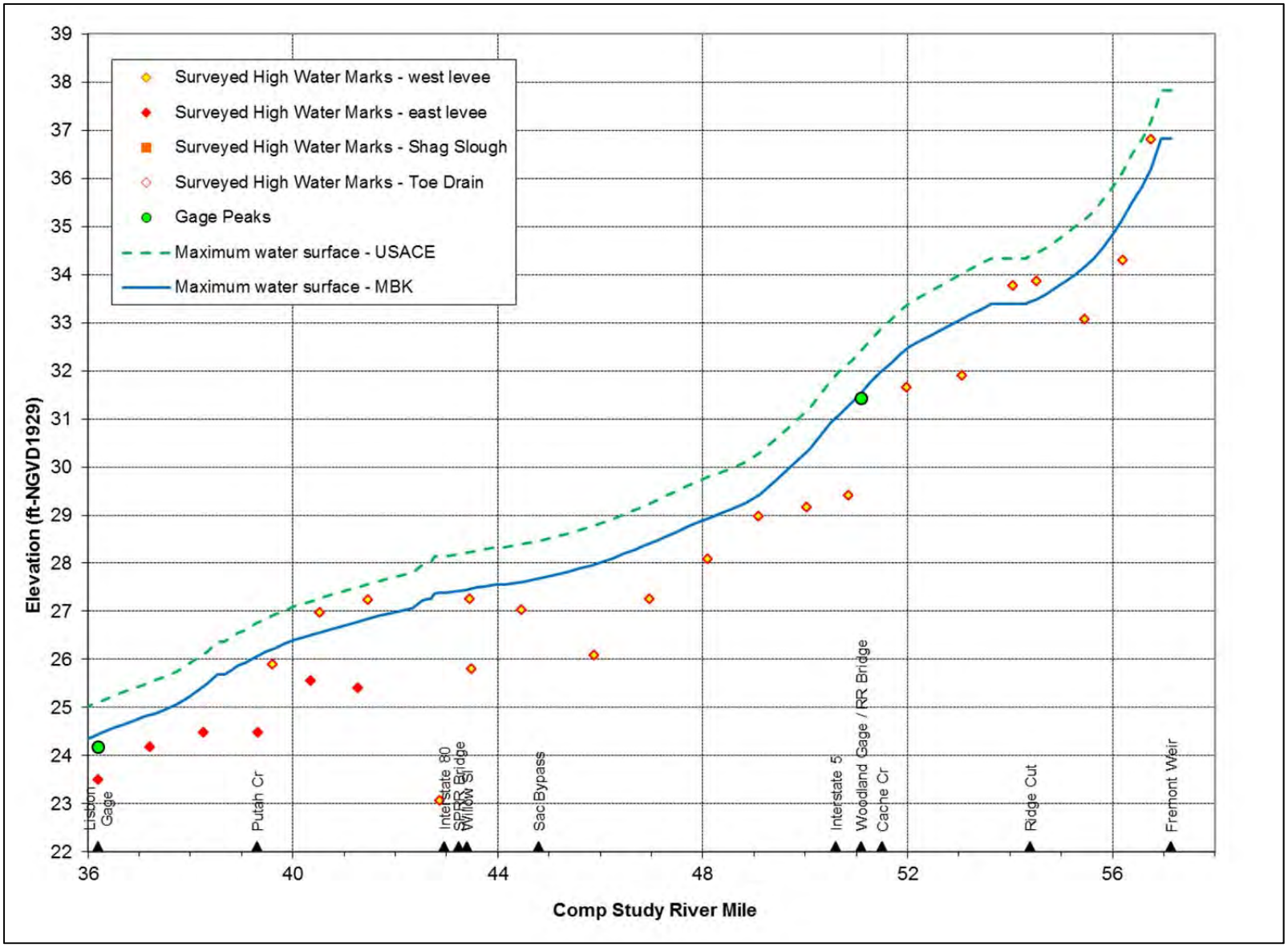

Figure 5. Yolo Bypass Maximum Water Surface Profile, January 1997 Calibration Simulation

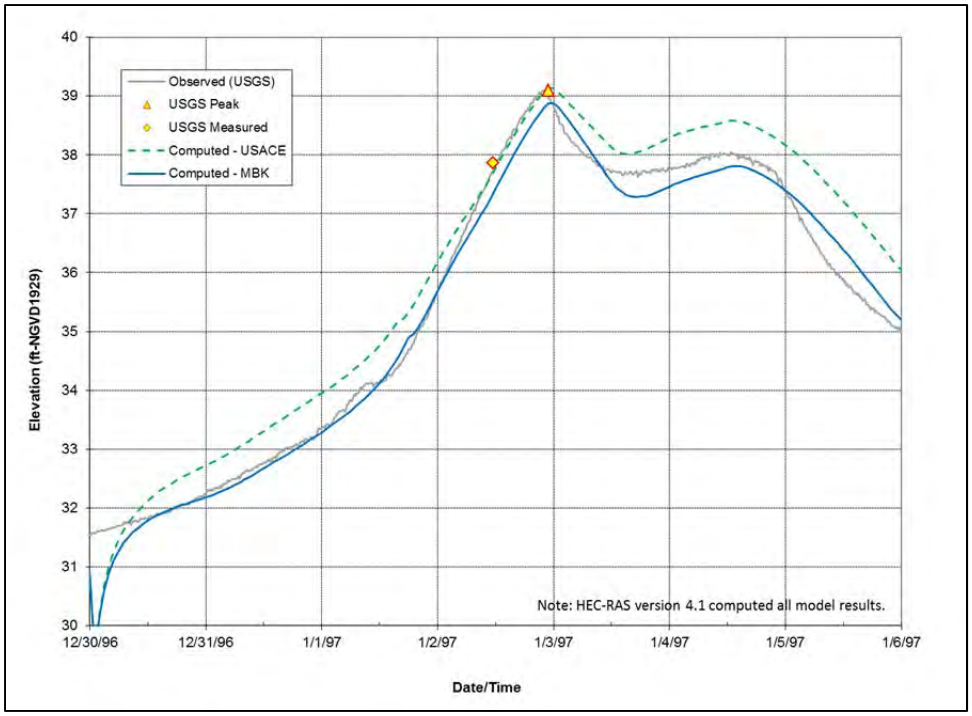

Figure 6. Sacramento River at Verona Gage (11425500 USGS) Water Surface Elevation, January 1997 Calibration Simulation

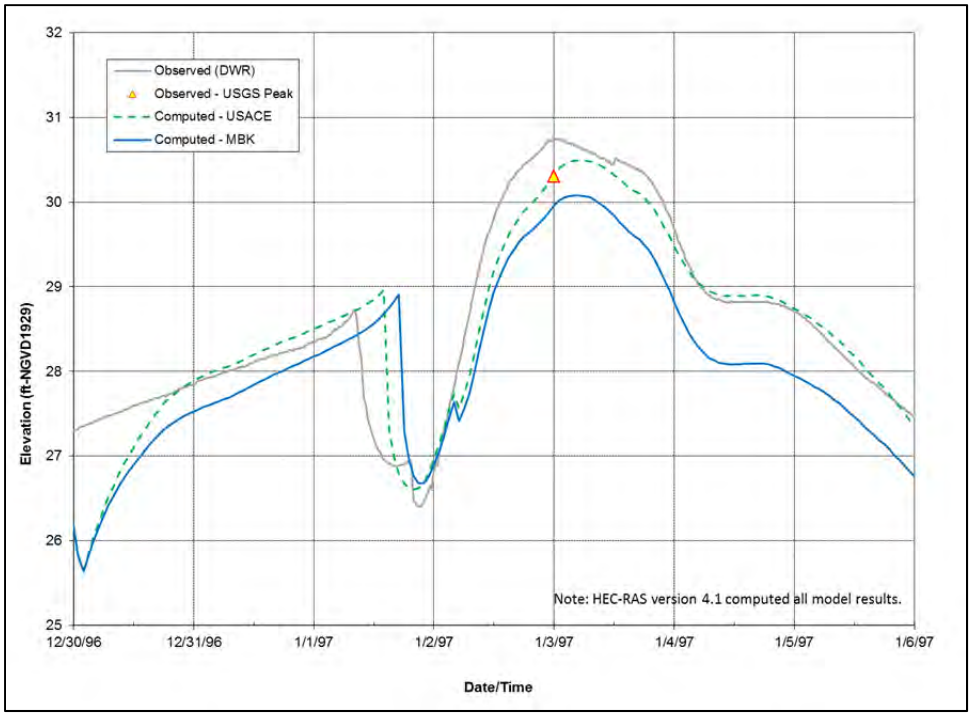

Figure 7. Sacramento River at Sacramento Weir (A02108 DWR) Water Surface Elevation, January 1997 Calibration Simulation

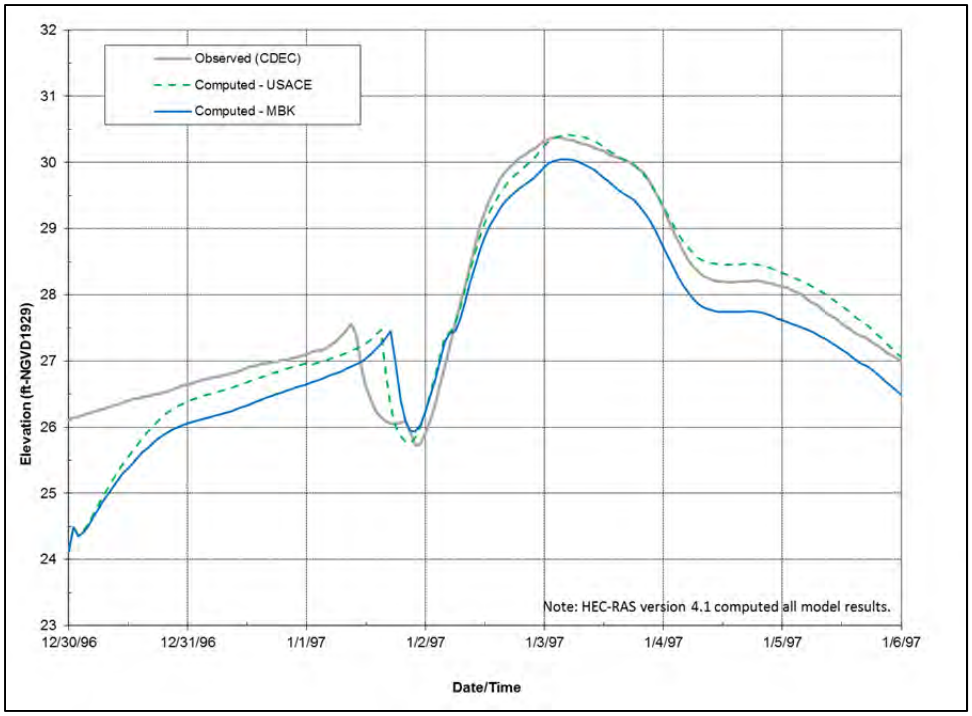

Figure 8. Sacramento River at I Street Gage (A02100 DWR) Water Surface Elevation, January 1997 Calibration Simulation

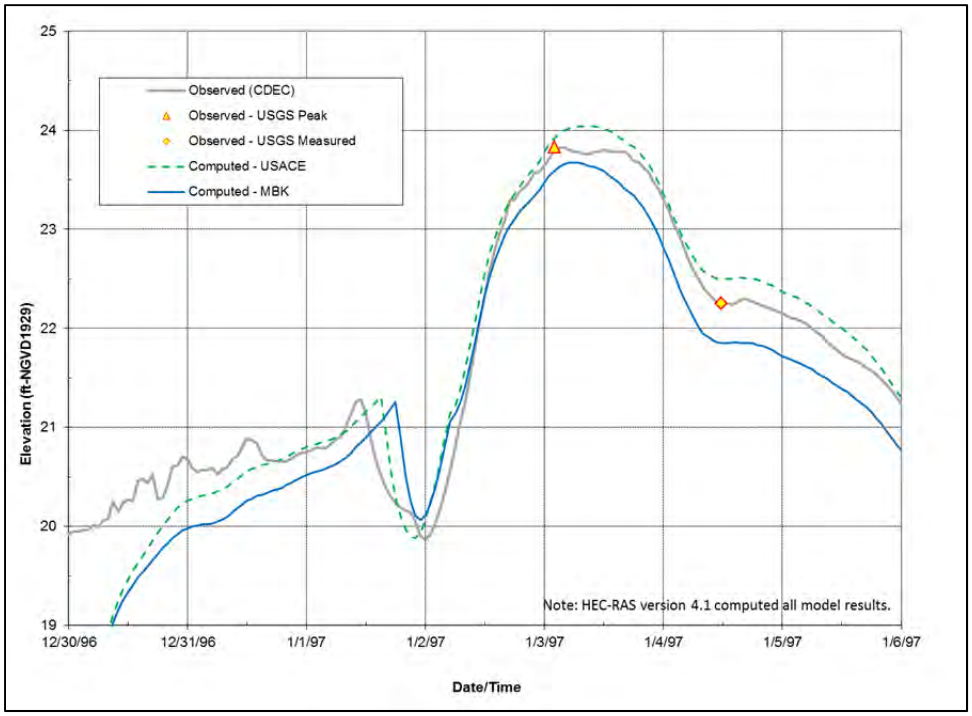

Figure 9. Sacramento River at Freeport Gage (11447650 USGS) Water Surface Elevation Figure 4, January 1997 Calibration Simulation

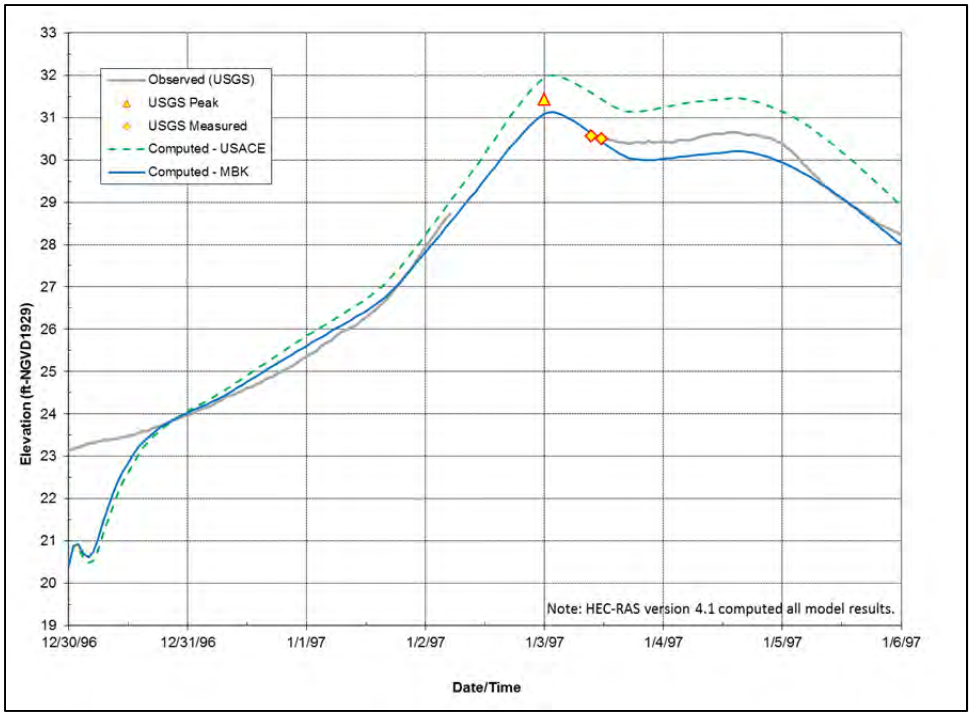

Figure 10. Yolo Bypass near Woodland Gage (11453000 USGS) Water Surface Elevation, January 1997 Calibration Simulation

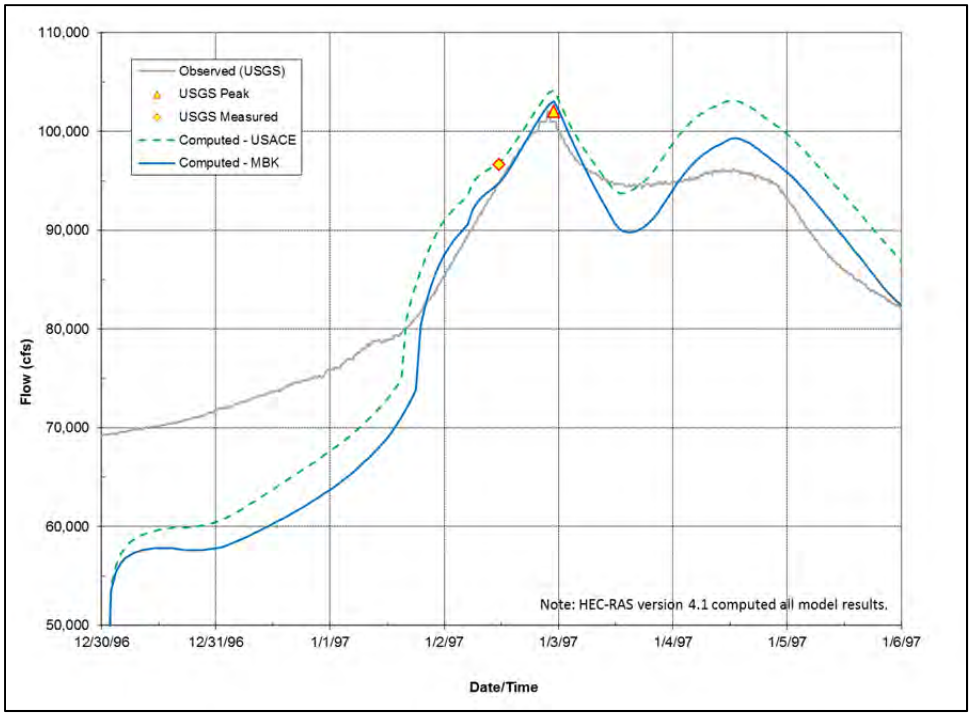

Figure 11. Sacramento River at Verona Gage (11425500 USGS) Flow, January 1997 Calibration Simulation

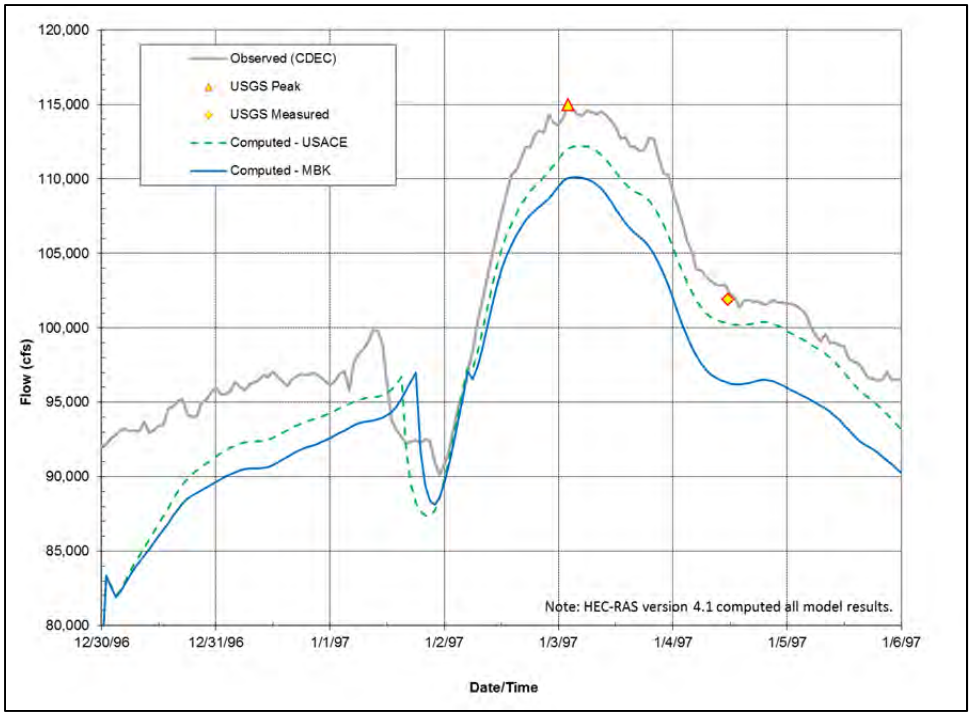

Figure 12. Sacramento River at Freeport Gage (11447650 USGS) Flow, January 1997 Calibration Simulation

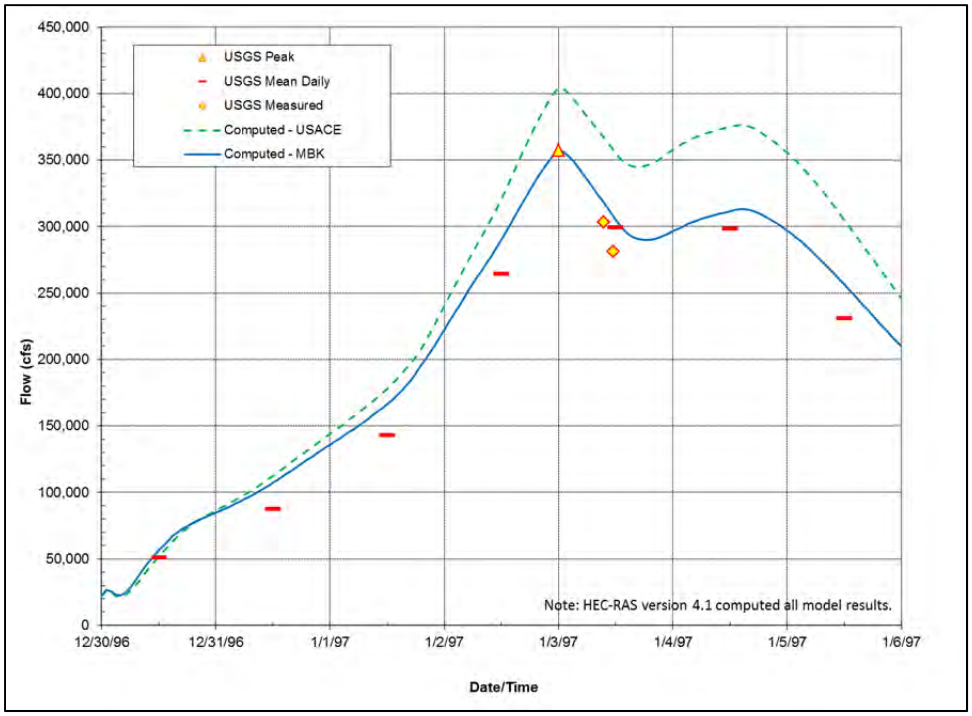

Figure 13. Yolo Bypass near Woodland Gage (11453000 USGS) Flow, January 1997 Calibration Simulation

Attachment 1

CESPK-ED-HD 13 December 2010

MEMORANDUM FOR RECORD

SUBJECT: Sacramento River Basin HEC-RAS Model Release 2

1. REFERENCES

a. Memorandum for Record, CESPK-ED-DH. Subject: Sacramento River Basin HEC-RAS Model Release, 24 March 2009.
b. Hydraulic Technical Documentation, Post-Authorization Change Report and Interim General Reevaluation Report, American River Watershed, Common Features Project, Natomas Basin, Sacramento and Sutter Counties, California, USACE, Sacramento District, August 2010.
c. Hydrologic Engineering Center, HEC-RAS River Analysis Program Version 4.0.0, March 2008.
d. Hydrologic Engineering Center, HEC-RAS User's Manual Version 4.0.0, March 2008.

2. PURPOSE. This memo documents a second release of the Sacramento Basin HEC-RAS model and accompanying documentation by the Sacramento District, U.S. Army Corps of Engineers (the Corps). An initial release of the model was completed in March 2009 with a Memorandum for Record, see Reference 1.a.

The Corps makes no warranty regarding use of the model beyond that described in the documentation accompanying the model - namely to support flood damage reduction feasibility study efforts of the Sacramento metropolitan areas along the Sacramento and lower American Rivers per applicable Corps guidance.

Those planning on using the model are responsible for applying it appropriately for their purpose(s). This includes ensuring that the boundary conditions included in the model are applicable.

3. MODEL DEVELOPMENT. The Sacramento River Basin HEC-RAS model was generated from previous modeling efforts in the Sacramento Basin. Much of the model geometry originated from the Sacramento Basin Comprehensive Study UNET model. The extent of the model is basically the same as the UNET model, except it does not include the Butte Basin and Sacramento River upstream of Colusa. The model was further enhanced by adding in top of levee profiles generated as part of the National Levee Database. The model was calibrated to the 1997 flood event and validated using the 2006 flood event. Model runs were completed using HEC-RAS version 4.0. The

model has been developed to varying levels of certainty on a reach by reach basis. The synthetic hydrology is the same as that used in the Comprehensive Study with some changes to flood routings through Folsom Dam (the objective release is assumed to be 160,000 cfs). It should be cautioned that much of the Hydrology for many of the smaller tributaries was not derived from detailed hydrologic analyses and only acts as a placeholder in the model. In addition, a simplified approach was used in generating the downstream boundary conditions for the n-yr frequencies. Further details regarding development of the model are contained in the documentation, *Draft Hydraulic Technical Documentation F3 Milestone, Appendix D, American River Watershed Common Features General Reevaluation Report (GRR).*

4. FUTURE MODEL DEVELOPMENT. The model and documentation are considered an interim product. The model is under continued development and therefore subject to change. Of particular note, the model with this release is based on the NGVD'29 vertical datum. The conversion of the model to NAVD'88 vertical datum is in process. As part of this effort, significant effort is being made to check and correct inaccuracies in the historical data used in calibration. Also, new modeling was generated for the east side of the Natomas Basin and is being incorporated into the basin model. A future release of the model will include these changes and perhaps others not mentioned here.

5. For questions or comments on the model and/or documentation contact Ethan Thompson, P.E., (916) 557-7142 or ethan.a.thompson@usace.army.mil.

Lea Adams, P.E.
Chief, Hydraulic Design Section
Sacramento District
U.S. Army Corps of Engineers

ATTACHMENT B

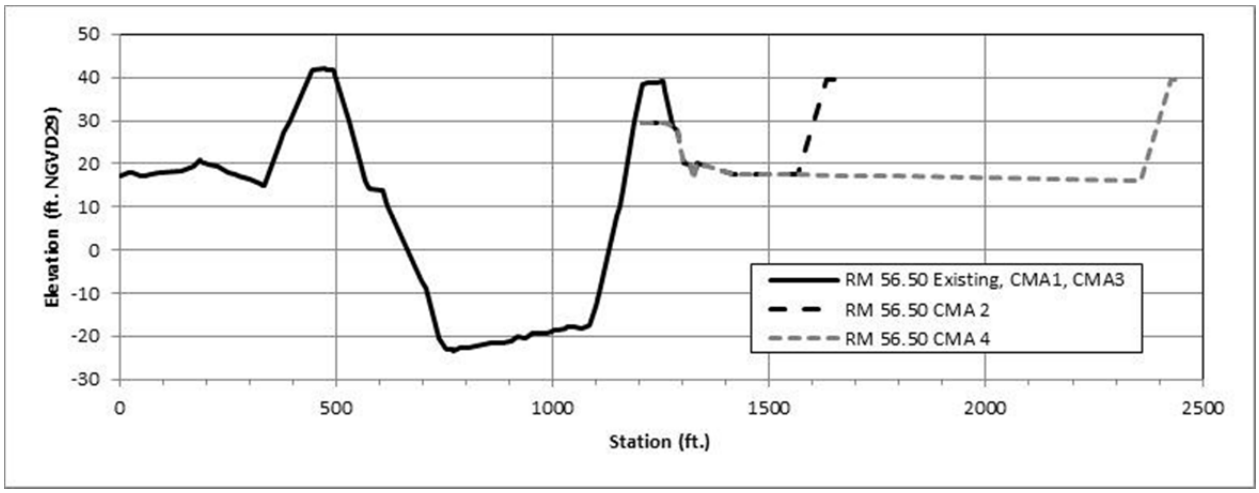

Exhibit B-1. Cross-section 56.50 (looking downstream)

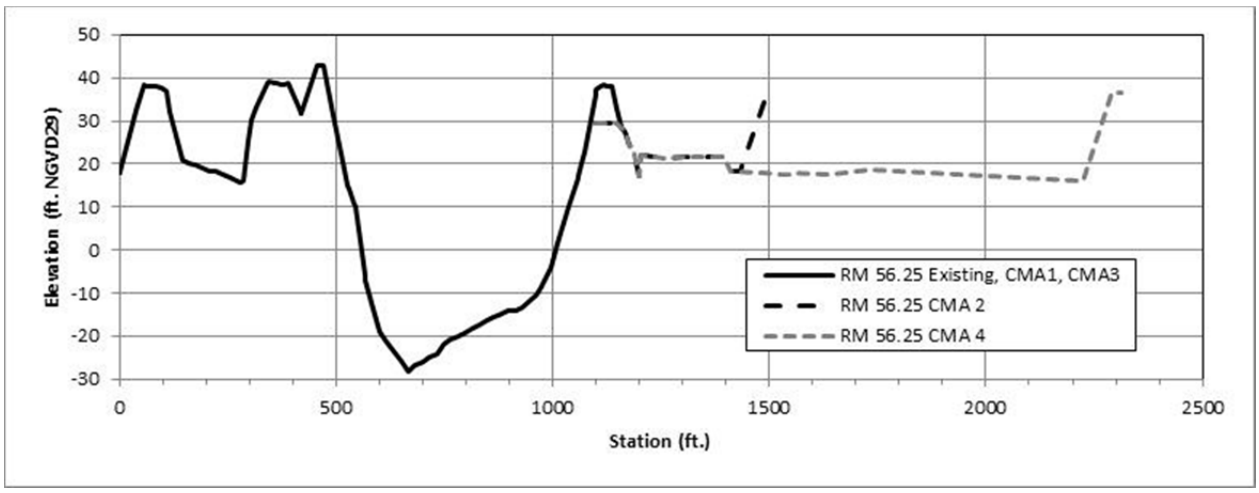

Exhibit B-2. Cross-section 56.25 (looking downstream)

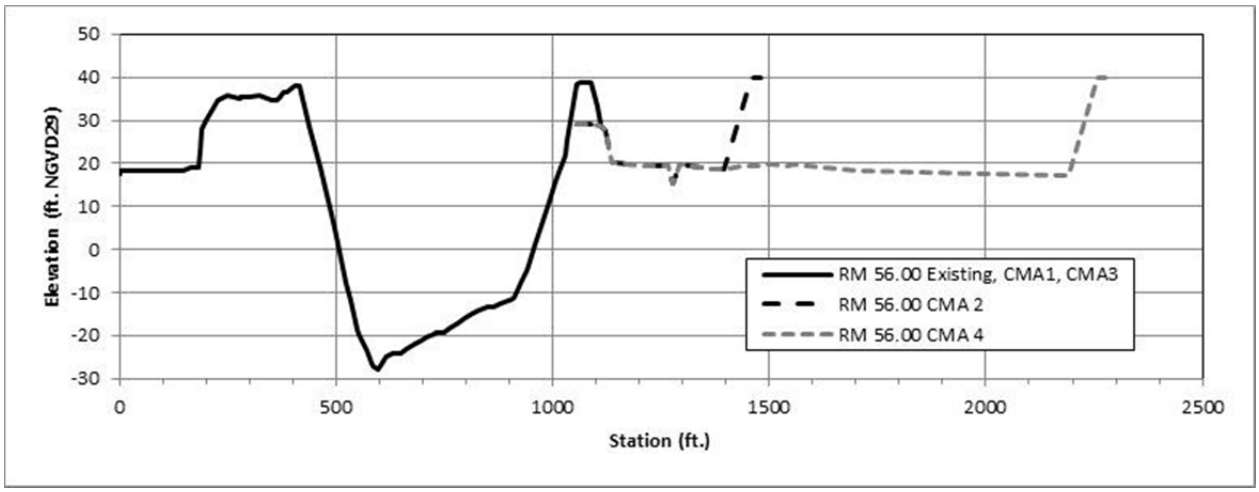

Exhibit B-3. Cross-section 56.00 (looking downstream)

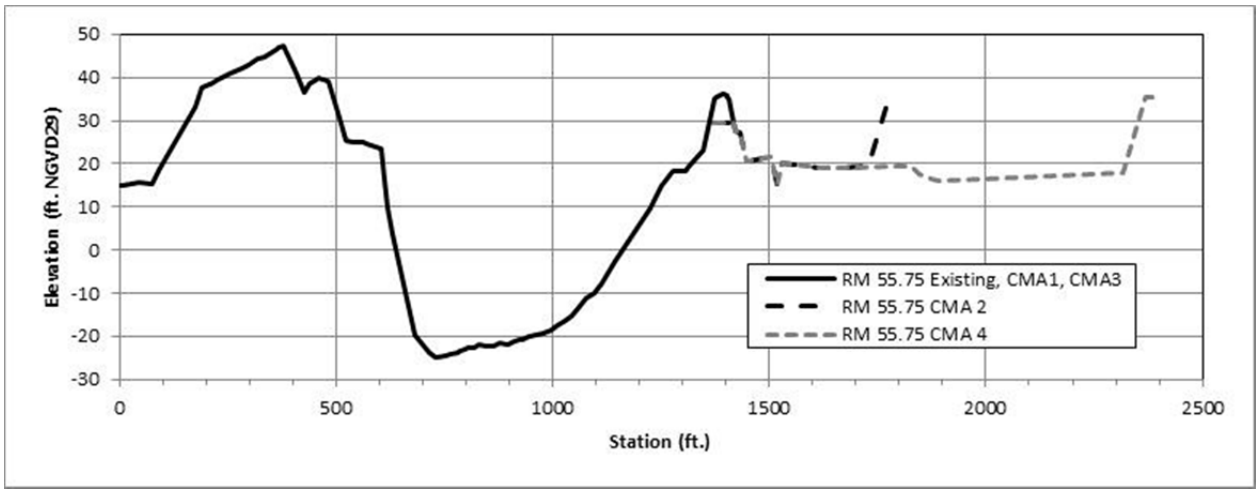

Exhibit B-4. Cross-section 55.75 (looking downstream)

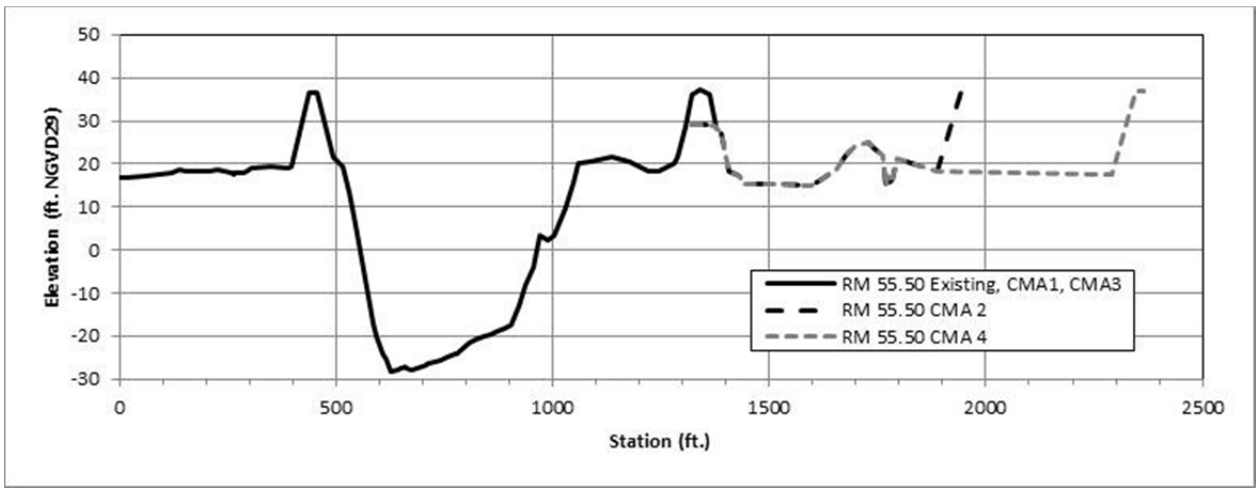

Exhibit B-5. Cross-section 55.50 (looking downstream)

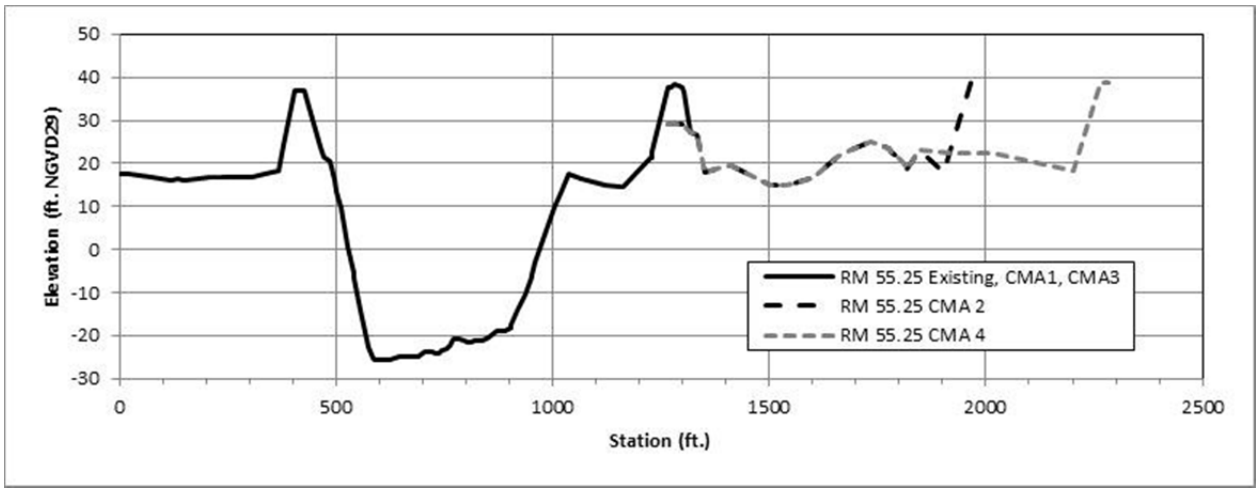

Exhibit B-6. Cross-section 55.25 (looking downstream)

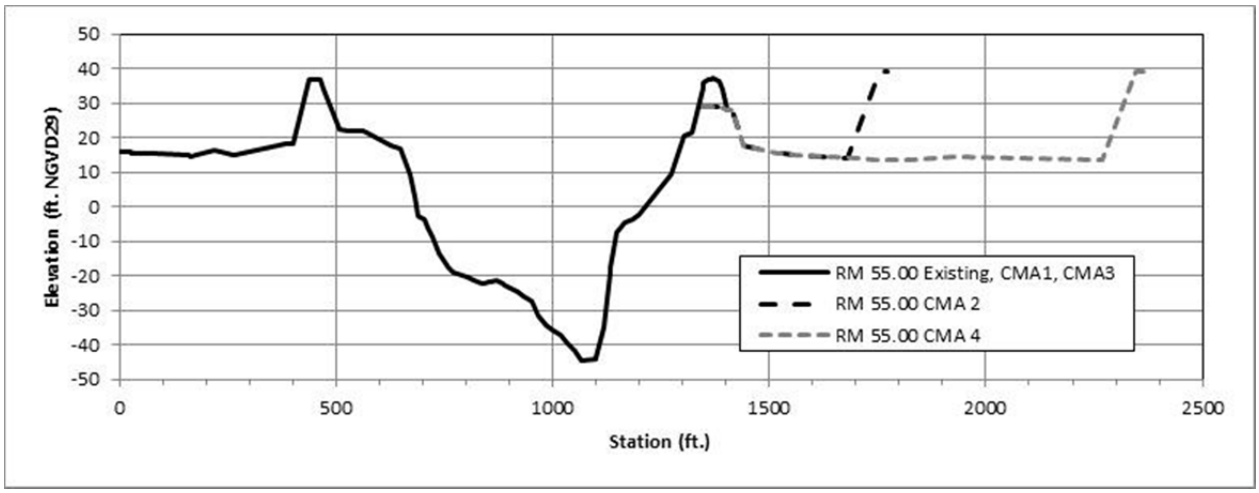

Exhibit B-7. Cross-section 55.00 (looking downstream)

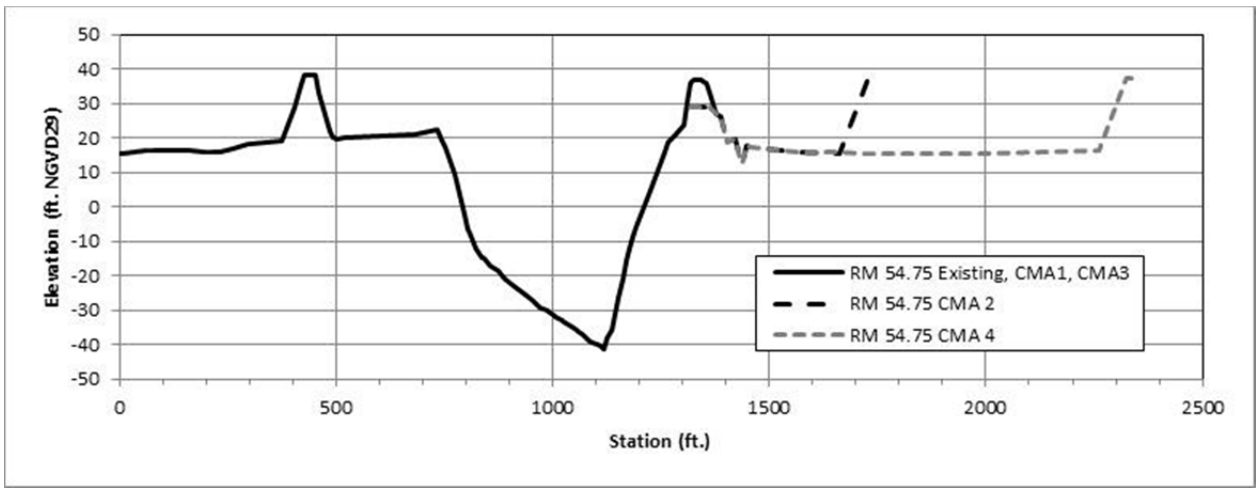

Exhibit B-8. Cross-section 54.75 (looking downstream)

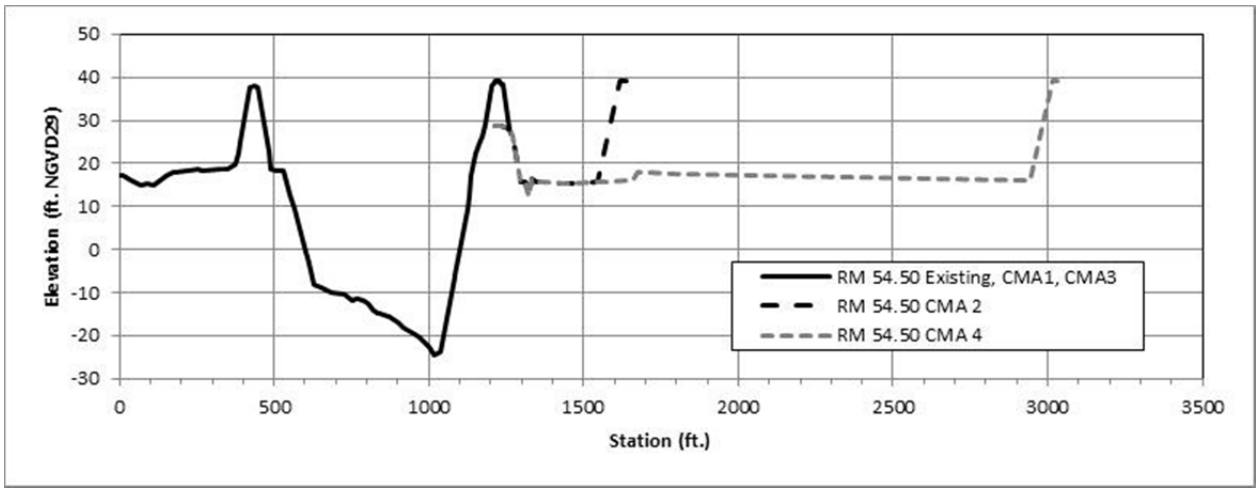

Exhibit B-9. Cross-section 54.50 (looking downstream)

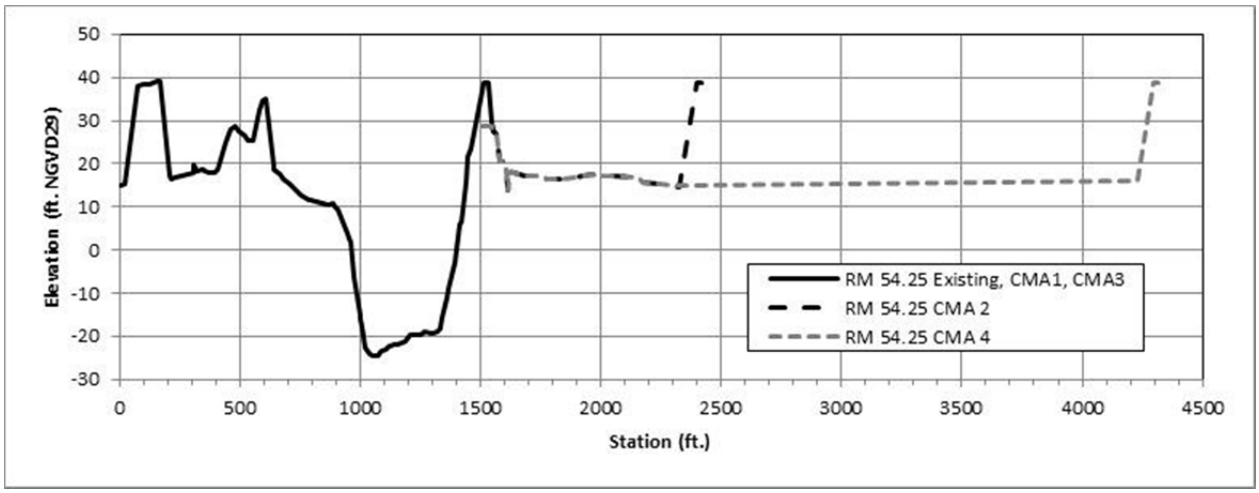

Exhibit B-10. Cross-section 54.25 (looking downstream)

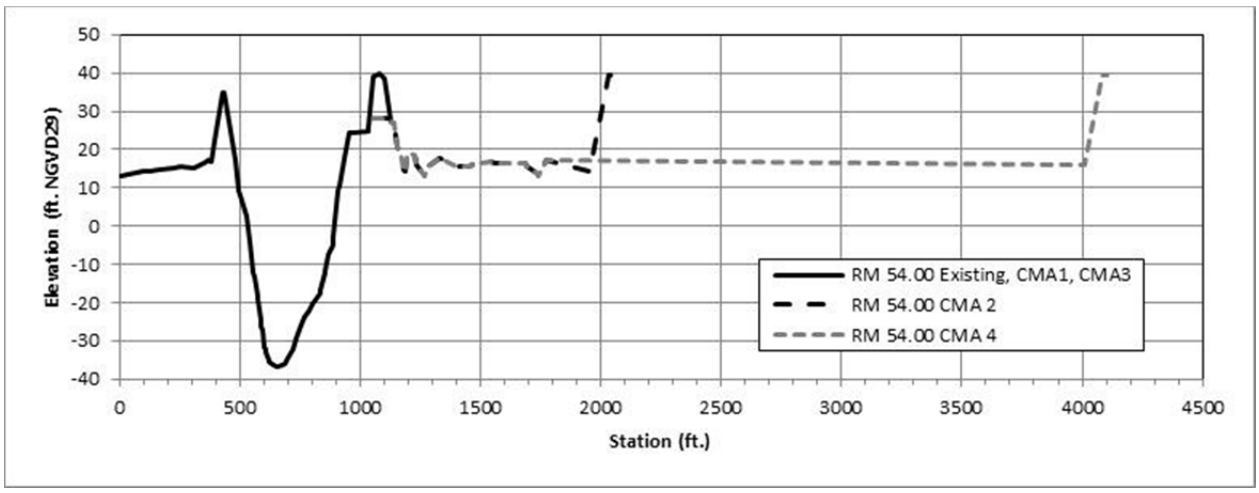

Exhibit B-11. Cross-section 54.00 (looking downstream)

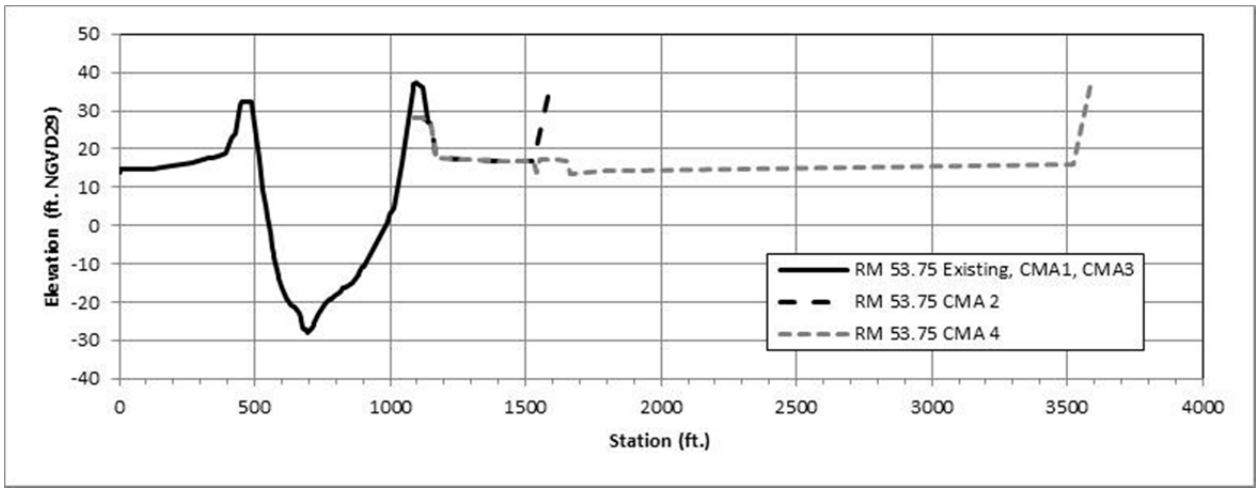

Exhibit B-12. Cross-section 53.75 (looking downstream)

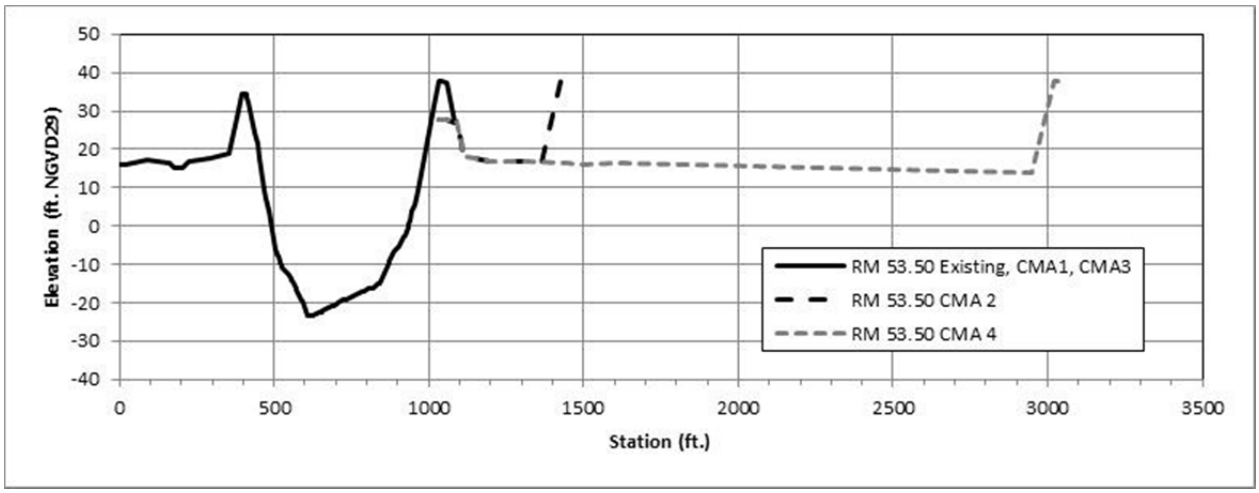

Exhibit B-13. Cross-section 53.50 (looking downstream)

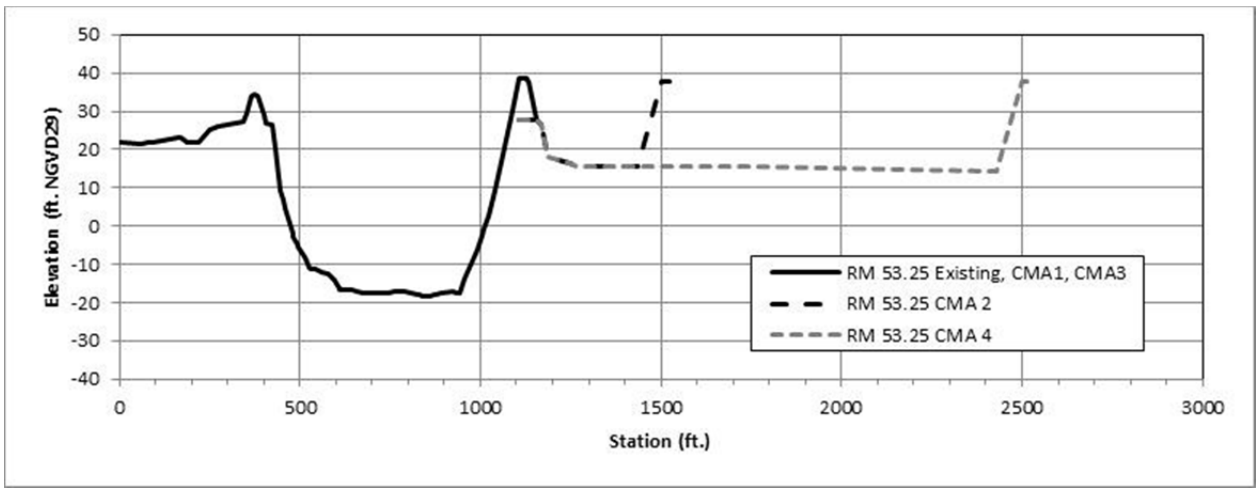

Exhibit B-14. Cross-section 53.25 (looking downstream)

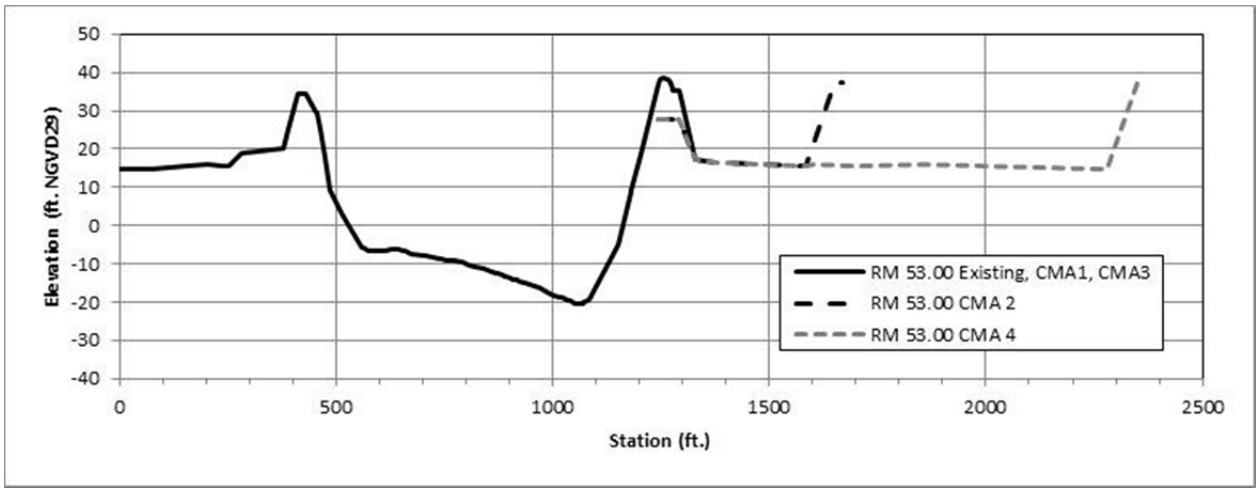

Exhibit B-15. Cross-section 53.00 (looking downstream)

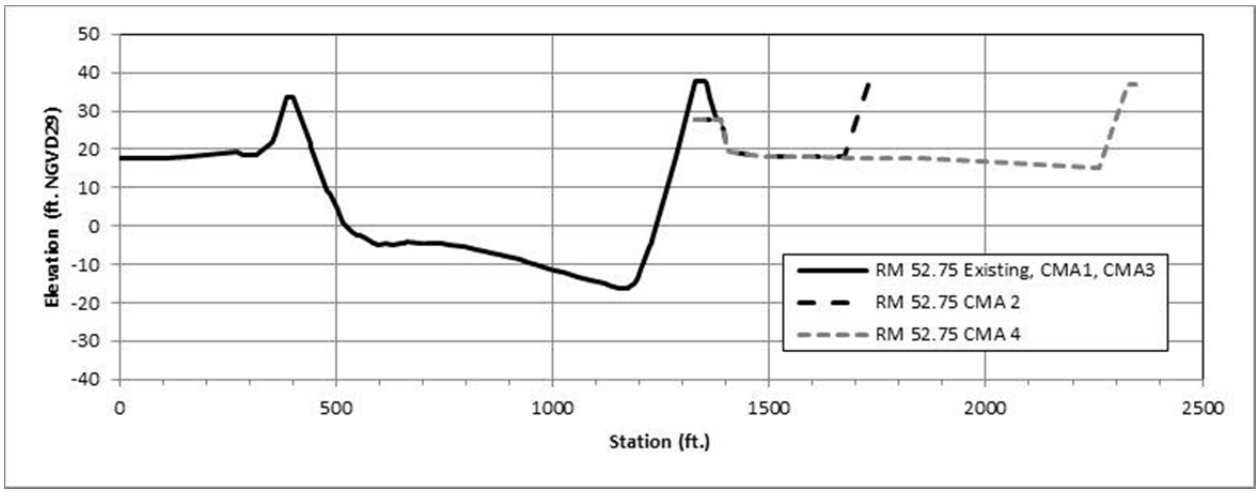

Exhibit B-16. Cross-section 52.75 (looking downstream)

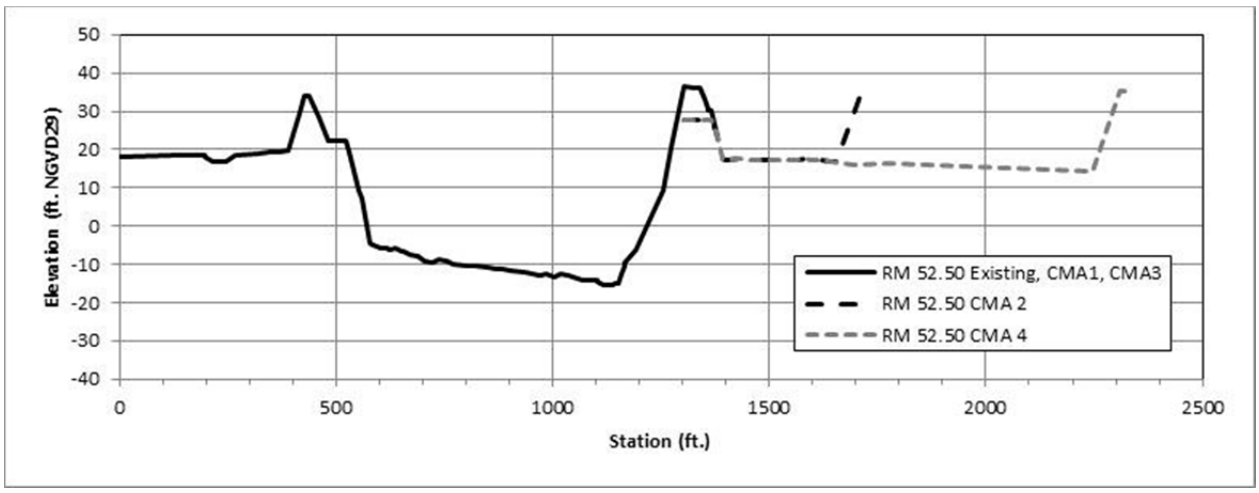

Exhibit B-17. Cross-section 52.50 (looking downstream)

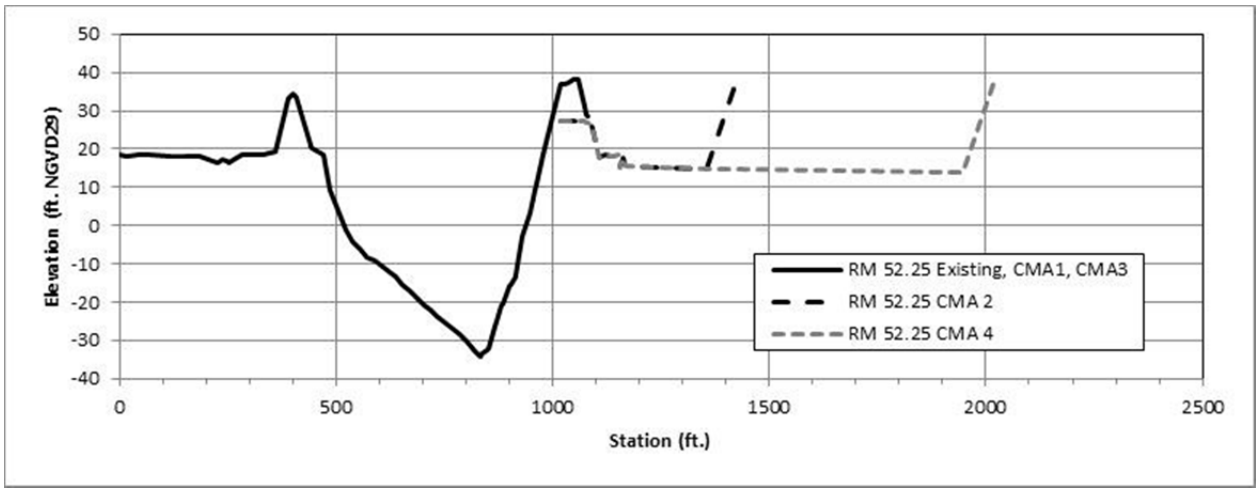

Exhibit B-18. Cross-section 52.25 (looking downstream)

Appendix C.5

Preliminary Existing Condition 2-Dimenstional Hydraulic Simulation Model—MBK Engineers, December 23, 2011

PRELIMINARY EXISTING CONDITION 2-DIMENSIONAL HYDRAULIC SIMULATION MODEL

Southport Early Implementation Project ***December 23, 2011***

Prepared by: Mike Archer, P.E.

Reviewed by: Don Trieu, P.E.

1.0 Background

The West Sacramento Area Flood Control Agency (WSAFCA) is studying a potential levee setback as part of the Southport Early Implementation Project (EIP). A preliminary hydraulic analysis of four "Combined Measure Alternative" (CMA) projects was performed by MBK Engineers (MBK) with a 1-dimensional (1-D) HEC-RAS hydraulic simulation model as documented in a technical memorandum entitled Hydraulic Impact Analysis – Southport Early Implementation Project, June 29, 2011. The project location is shown in Exhibit H-1. A more detailed site map of the project area showing river miles and reference locations is provided in Exhibit H-2. To better understand and analyze the hydraulic impacts of the various CMA's and aide in design of the preferred CMA, a 2-dimensional (2-D) hydraulic simulation model is being developed. The development of the 2-D model is a being performed over two phases. The first phase consists of developing and calibrating the 2-D model to simulate the existing condition while the second phase consists of simulating the preferred CMA, to be determined at a later date. This Technical Memorandum discusses and presents phase one of the model development. Also included are results of preliminary simulations of the 100-year (1% annual chance of exceedence) and 200-year (model 0.5% annual chance of exceedence) flood events for existing conditions.

The model and analysis are considered preliminary because it is likely that the model mesh will be modified and refined to improve model efficiency and stability. Modifications may also be necessary to the existing condition model when the preferred CMA is developed to ensure consistency between the models for purposes of comparison.

2.0 Purpose

The 2-D hydraulic model is being developed for the Southport EIP to better analyze the localized hydraulics of the various CMA's for use in hydraulic impact analysis and design. Some of the CMA's consist of setting back the existing levee. The sharing of water between the Sacramento River main channel and the levee setback area is significantly 2-dimensional in

nature. The 2-D hydraulic model will allow for improved analysis of the effects of partial levee removal and degrading, setback area grading and habitat enhancement. The 1-D model documented in the previously noted June 29, 2011 technical memorandum will still be needed for analyzing regional impacts and the results of the 2-D model will be used to refine the 1-D model for future regional impact studies.

3.0 Hydraulic Model

The 2-D model was developed using the Aquaveo SMS program, version 10.1. SMS is a pre- and post-processor for surface water modeling and analysis. The numerical hydraulic analysis was performed with RMA2 version 4.58. RMA2 is a 2-D depth averaged finite element hydrodynamic numerical model that computes water surface elevations and horizontal velocity components for subcritical, free-surface 2-D flow fields. RMA2 is on the FEMA list of numerical models that are acceptable for use for National Flood Insurance Program (NFIP) purposes.

4.0 Mesh Development

The 2-D model extends from the I Street stream-gage located about 900 feet upstream of the I Street Bridge (Comp Study[1] river mile 59.9) downstream to the Freeport stream-gage located at the Freeport Bridge (Comp Study river mile 46.4). The boundaries were selected such that they corresponded with streamgage locations and were sufficient distance from the project site to eliminate the potential of the boundary conditions influencing the results at and near the project site. The upstream boundary is approximately 3.1 miles upstream of the Project site and the downstream boundary is approximately 5.3 miles downstream of the Project site. Elevation contours from the topographic data described in Section 5.0 along with Comp Study elevation contour maps were used during the mesh construction to ensure that the mesh shape corresponded to the elevation contours as much as practicable. This initial model development was for existing conditions, however mesh elements were included at the project site in anticipation of model development of levee setback alternatives. Additionally, the model mesh was designed so that a recently constructed levee setback on the Sacramento River right bank downstream of Stone Lock, which did not exist at the time of the calibration and verification flood events, could be included in the existing conditions simulations and not included in the calibration and verification simulations. The 2-D model mesh is shown in Exhibit H-3.

Structures such as bridge piers and marinas were not explicitly included in this initial model, but were implicitly accounted for with increased roughness coefficients.

[1] Sacramento and San Joaquin River Basins Comprehensive Study. The United States Army Corps of Engineers (USACE) digitized stream centerlines and produced the Comp Study river mile stationing for hydraulic model development for the Comp Study. The Comp Study river mile stationing differs from the United States Geologic Survey (USGS) river mile stationing by 0.28 miles at the I Street Bridge (USGS river mile 60.00 = Comp Study river mile 60.28).

5.0 Topography

The topographic data used for the model was provided by HDR Engineering, Inc. The topographic data was a combination of 2007 LiDAR data from the city of West Sacramento and 2008 bathymetry data from the California Department of Water Resources (DWR). The DWR bathymetry was supplemented, where needed, with bathymetry data from the Comp Study. The topographic data is referenced to the North American Vertical Datum of 1988 (NAVD88).

6.0 Boundary Conditions

The 2-D model analysis will be steady state. The boundary conditions for the 2-D model are flow at the upstream boundary and corresponding stage at the downstream boundary. The 2-D model boundaries are defined at streamgage locations so that observed values can be used for the model calibration and verification. The 100-year and 200-year boundary conditions will be from the 1-D model simulations.

7.0 Calibration and Verification

The January 1997 flood event (1997 flood) was used for model calibration. The 1997 flood is commonly used for Sacramento River basin hydraulic model calibration because it is one of the largest flood events in recent history in the study area, with an estimated 1-day duration return period of about 90 years (1.1% chance of exceedence)[2], and there are abundant surveyed high water mark data. The 1997 flood peak flow reported at the USGS Freeport stream-gage (11447650) was 115,000 cubic feet per second (cfs). The January 2006 flood event (2006 flood) was used for model verification. The 2006 flood was much smaller than the 1997 flood, probably on the order of a 5 to 10 year flood, but was large enough that numerous high water marks were collected.

For the upstream boundary condition (I Street) of the 2-D model, a flow is required for input into the model. Since flow data is not published for the I Street gage (Sacramento River at Sacramento, DWR A02100), flow data at the USGS Freeport gage (11447650) will be used for model calibration and verification. The California Data Exchange Center (CDEC) reports real-time flow data for the I Street gage (IST), but the quality of the rating curve is not known. Flow data is published for the USGS Freeport gage. The USGS makes regular streamflow measurements and rating curve adjustments for the Freeport gage, therefore the reported flow data at the Freeport gage is more reliable than that at the I Street gage. Due to the relatively uniform channel between I Street and Freeport the peak flow during large flood events does not vary significantly between those locations. Hydraulic simulations of the 1997 and 2006 floods with the 1-D model indicate a difference of less than 1%. Based on this, the peak flow reported at the Freeport gage was used as the upstream boundary condition for the 2-D model calibration and verification simulations. Review of observed hydrographs at I Street and Freeport indicate

[2] Sacramento and San Joaquin River Basins Comprehensive Study, Technical Studies Documentation, Appendix B, Synthetic Hydrology Technical Documentation, USACE, December 2002.

that the peaks occurred at essentially the same time at both locations, therefore the peak stage reported at the Freeport gage was used as the downstream boundary condition for the 2-D model calibration and verification simulations. The calibration and verification boundary conditions are summarized in Table 1. The datum of the Freeport gage is 100 feet below NGVD29. USACE determined as a result of a datum analysis and survey of the gage reference as part of the American River Common Features Feasibility Study that the gage height can be converted to NAVD88 by subtracting 97.84 feet.

Table 1. Calibration and Verification Boundary Conditions

Study	Flood Event	Upstream Boundary – Flow, Sacramento River at I Street	Downstream Boundary – Stage, Sacramento River at Freeport
Calibration	1997	115,000 cfs	25.99 ft. NAVD88
Verification	2006	97,200 cfs	23.30 ft. NAVD88

The locations of the available surveyed high water marks in the study area for the 1997 and 2006 floods are shown in Exhibits H-4 and H-5. The high water marks for both the 1997 flood and 2006 flood were staked and surveyed by the California Department of Water Resources. The 1997 and 2006 high water mark elevations are summarized in Tables 2 and 3. The recorded peak stage data for the I Street and Freeport streamgages shown in Table 4 will also be used for the calibration and verification.

Table 2. January 1997 Flood Event Surveyed High Water Marks (Source: DWR)

ID/Description	Coordinates		Comp Study River Mile	High Water Mark Elevation (ft. NAVD88)
	Easting	Northing		
80' upstream of L.M. 0.4 post	6703000	1977680	59.95	33.0 [a]
175' downstream of Hwy. 80 bridge	6700130	1969810	58.45	31.9 [a]
TBM MF 1	6701760	1960880	56.50	30.6 [b]
TBM MF 2	6699510	1957030	55.68	29.9 [b]
TBM MF 3	6697680	1952950	54.35	29.5 [b]
TBM MF 4	6695990	1950320	53.70	29.6 [b]
TBM MF 5	6690860	1949170	52.70	28.6 [b]
TBM MF 6	6688160	1943790	51.40	28.2 [b]
TBM MF 7	6690640	1939160	50.38	27.6 [b]
TBM MF 8	6693550	1935460	49.43	27.0 [b]
TBM MF 9	6699830	1935310	48.20	26.5 [b]
TBM MF 10	6703510	1933740	47.47	26.1 [b]
Upstream @ Freeport bridge	6704560	1928290	46.43	25.7 [b]

[a] Original HWM referenced to NGVD29 vertical datum. Converted to NAVD88 by adding 2.3 ft. as per USACE conversion of Sacramento River HEC-RAS at this location.
[a] Original HWM referenced to NGVD29 vertical datum. Converted to NAVD88 by adding 2.2 ft. as per USACE conversion of Sacramento River HEC-RAS at this location.

Table 3. January 2006 Flood Event Surveyed High Water Marks (Source: DWR)

ID	Coordinates		Comp Study River Mile	High Water Mark Elevation (ft. NAVD88)
	Easting	Northing		
3264	6702350	1976050	59.74	29.9
3262	6702320	1975680	59.67	29.4
3258	6702130	1974560	59.45	29.4
3260	6701940	1973930	59.32	29.3
70002	6701370	1959260	56.21	27.8
70006	6696140	1950330	53.74	27.3
70008	6693760	1950090	53.28	26.5
70010	6691190	1949260	52.76	26.1
70012	6689230	1947730	52.22	25.6
70014	6688390	1945250	51.71	25.2
70016	6688510	1942650	51.16	24.8
70018	6689910	1940440	50.66	25.3
70020	6691220	1938150	50.16	25.1
70021	6692880	1935960	49.6	24.6
70023	6695200	1935040	49.07	24.2
70025	6697820	1935210	48.56	24.1
3051	6700390	1935320	48.08	23.6
3053	6702860	1934450	47.62	24.4
3055	6704190	1929980	46.76	23.8

Table 4. January 1997 and January 2006 Peak Stages at Streamgages

Gage	Agency/ ID	Comp Study River Mile	Flood Event	Peak Gage Height (ft.)	Gage Height to NAVD88 [a]	Peak Stage (ft. NAVD88)
Sacramento River at Sacramento (I Street)	DWR A02100	59.86	1997	30.38[b]	+2.54	32.92
			2006	27.70[b]	+2.54	30.24
Sacramento River at Freeport	USGS 11447650	46.43	1997	23.83[b]	+2.16	25.99
			2006	121.14[c]	-97.84	23.30

[a] Conversion to NAVD88 based on survey of gage reference by USACE for the American River Common Features Feasibility Study.
[b] Gage datum = 0 ft. NGVD29
[c] Gage datum = 100 ft. NGVD29

The model was calibrated by adjusting Manning's n roughness coefficients until the model reasonably reproduced the 1997 flood observed peak water surfaces. Each 2-d model mesh element is assigned a "material" which has an associated Manning's n roughness coefficient.

Mesh element materials were assigned based on review of aerial photography. Exhibit H-6 shows the material map for the calibrated model. The final roughness coefficients used in the model calibration are listed in Table 5. The HEC-RAS Hydraulic Reference Manual, Version 4.1, January 2010, provides a summary table of typical Manning's n value ranges from "Open-Channel Hydraulics" by V.T. Chow, 1959. The applicable values for the 2-d model are provided in Table 6. For the most part, the calibrated n values are at or below low end of the typical range documented by Chow.

The calibrated 1997 flood water surface elevation profile with observed high water data is shown in Exhibit H-7. A tabulation comparing the observed high water elevations and the computed water surface elevations from the calibration simulation is provided in Table 7. The differences of the computed calibration water surface elevations from the observed elevations range from -0.52 ft. to +0.75, with an average difference of +0.14 ft.

After completion of the model calibration, the 2006 flood event was simulated with the calibrated model to check the model's ability to reproduce a different flood event, that is, to verify the model. The 2006 flood verification simulation water surface profile with observed high water data is shown in Exhibit H-8. A tabulation comparing the observed high water elevations and the computed water surface elevations from the calibration simulation is provided in Table 8. The differences of the computed verification water surface elevations from the observed elevations range from -1.17 ft. to +0.63 ft., with an average difference of -0.15 ft.

Table 5.Manning's n Roughness Coefficient

Material	Manning's n Roughness Coefficient
Channel	0.024
No brush	0.030
Scattered trees	0.045
Dense trees	0.065
Marina	0.180

Table 6. Typical Manning's n Roughness Coefficients

Type of Channel and Description	Manning's n Roughness Coefficient		
	Minimum	Normal	Maximum
Main Channel: clean, straight, full, no rifts or deep pools	0.025	0.030	0.033
Scattered brush, heavy weeds	0.035	0.050	0.060
Light brush and trees, in winter	0.035	0.050	0.070
Heavy stand of timber, few down trees, little undergrowth, flow below branches	0.080	0.100	0.120
Same as above, but with flow into branches	0.100	0.120	0.160

Table 7. 1997 Flood Event Calibration Results

ID/Description	Comp Study River Mile	Maximum Water Surface Elevation (ft. NAVD88)		Difference
		Observed	Computed	
I St gage	59.86	32.92	33.06	0.14
175' DS of Hwy 80 bridge	58.45	31.9	31.62	-0.29
TBM MF 1	56.50	30.6	30.85	0.25
TBM MF 2	55.68	29.9	30.13	0.23
TBM MF 3	54.35	29.5	29.49	-0.01
TBM MF 4	53.70	29.6	29.08	-0.52
TBM MF 5	52.70	28.6	28.86	0.26
TBM MF 6	51.40	28.2	28.12	-0.08
TBM MF 7	50.38	27.6	27.84	0.24
TBM MF 8	49.43	27.0	27.36	0.36
TBM MF 9	48.20	26.5	27.04	0.54
TBM MF 10	47.47	26.1	26.85	0.75
US of Freeport Bridge	46.43	25.7	26.00	0.30
Freeport gage	46.43	25.99	26.00	0.01

Table 8. 2006 Flood Event Verification Results

ID/Description	Comp Study River Mile	Maximum Water Surface Elevation (ft. NAVD88)		Difference
		Observed	Computed	
I St gage	59.86	30.24	29.70	-0.54
3264	59.74	29.9	29.46	-0.44
3262	59.67	29.4	29.47	0.07
3258	59.45	29.4	29.23	-0.17
3260	59.32	29.3	28.94	-0.37
70002	56.21	27.8	27.55	-0.25
70006	53.74	27.3	26.13	-1.17
70008	53.28	26.5	25.97	-0.53
70010	52.76	26.1	25.90	-0.20
70012	52.22	25.6	25.52	-0.08
70014	51.71	25.2	25.44	0.24
70016	51.16	24.8	25.14	0.34
70018	50.66	25.3	25.09	-0.21
70020	50.16	25.1	24.86	-0.24
70021	49.60	24.6	24.56	-0.04
3051	48.08	23.6	24.23	0.63
70025	48.56	24.1	24.28	0.18
70023	49.07	24.2	24.37	0.17
3053	47.62	24.4	24.10	-0.30
3055	46.76	23.8	23.59	-0.21
Freeport gage	46.43	23.3	23.30	0.00

8.0 Preliminary Simulation of 100-year and 200-year Floods

The 2-D model boundary conditions for the 100-year and 200-year flood events were obtained from the 1-D model simulations of the existing conditions documented in the June 29, 2011 Technical Memorandum. The 100-year and 200-year flood event simulations assumed that levees do not fail, but rather act as weirs if overtopped, and that the Folsom Joint Federal Project (JFP) was completed. The 100-year and 200-year 2-D model boundary conditions are summarized in Table 9. Contour maps of the computed velocities and water surface elevations for the 100-year and 200-year simulations are provided in Exhibits H-9 through H-12. The water surface elevations computed by the 2-D model compare well with those computed by the 1-D model as shown in Exhibits H-13 and H-14.

Table 9. 100-year and 200-year Flood Event Boundary Conditions

Flood Event	Upstream Boundary – Flow, Sacramento River at I Street	Downstream Boundary – Stage, Sacramento River at Freeport
100-year	118,600 cfs	27.3 ft. NAVD88
200-year	131,100 cfs	29.0 ft. NAVD88

9.0 Future Hydraulic Analysis

This technical memorandum presents the initial development, calibration and verification of the Southport EIP 2-D flood hydraulic analysis model, along with the results of preliminary 100-year and 200-year simulations of the existing conditions.

The model will be used to simulate the preferred CMA levee setback alternatives when those are available. During incorporation of preferred CMA into the 2-D model it is possible that further refinements will be made to the existing condition model. If this occurs, the calibration, verification and existing conditions simulations will be updated.

The results of the 2-D model runs will also be used to refine the 1-D model representation of the CMA's if necessary.

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EXHIBITS

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Exhibit H-1. Location Map

Exhibit H-2. Site Map

Exhibit H-3. 2-D Model Mesh (sheets 1 thru 4)

Exhibit H-4. 1997 Flood High Water Mark Locations (sheets 1 thru 4)

Exhibit H-5. 2006 Flood High Water Mark Locations (sheets 1 thru 4)

Exhibit H-6. Calibration Water Surface Elevation Profile – January 1997 Flood

Exhibit H-7. Calibrated Model Material Map (sheets 1 thru 4)

Exhibit H-8. Verification Water Surface Elevation Profile – January 2006 Flood

Exhibit H-9. Velocity Contour Map, 100-year Flood Event (sheets 1 thru 4)

Exhibit H-10. Water Surface Elevation Contour Map, 100-year Flood Event (sheets 1 thru 4)

Exhibit H-11. Velocity Contour Map, 200-year Flood Event (sheets 1 thru 4)

Exhibit H-12. Water Surface Elevation Contour Map, 200-year Flood Event (sheets 1 thru 4)

Exhibit H-13. 100-year Water Surface Elevation Profile

Exhibit H-14. 200-year Water Surface Elevation Profile

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- PROJECT_BOUNDARY
- COUNTIES
- INTERSTATE
- US HIGHWAY
- STATE HIGHWAY
- WATERWAYS AND WATER BODIES

Location Map

Exhibit H-1

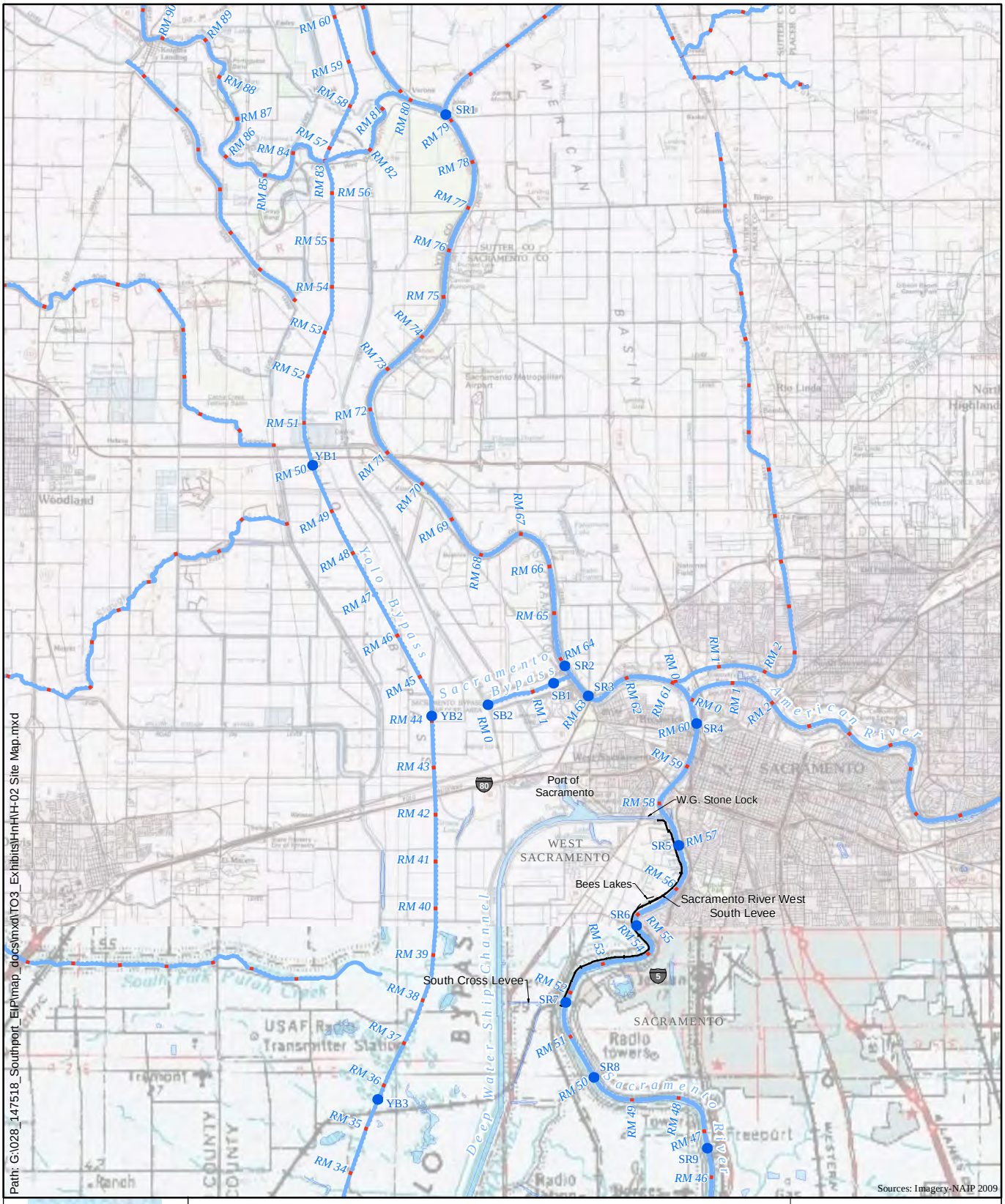
Project Num: 453318-166505-028

Dec 2011

N W E S

0 1 2 3 4

Miles
1 in = 4 miles



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SB1 **INDEX POINT LOCATION**

WATERWAY CENTERLINE

RM 57 **RIVER MILES**

PROJECT STATIONING

Site Map

Exhibit H-2

Project Num: 453318-166505-028

Dec 2011

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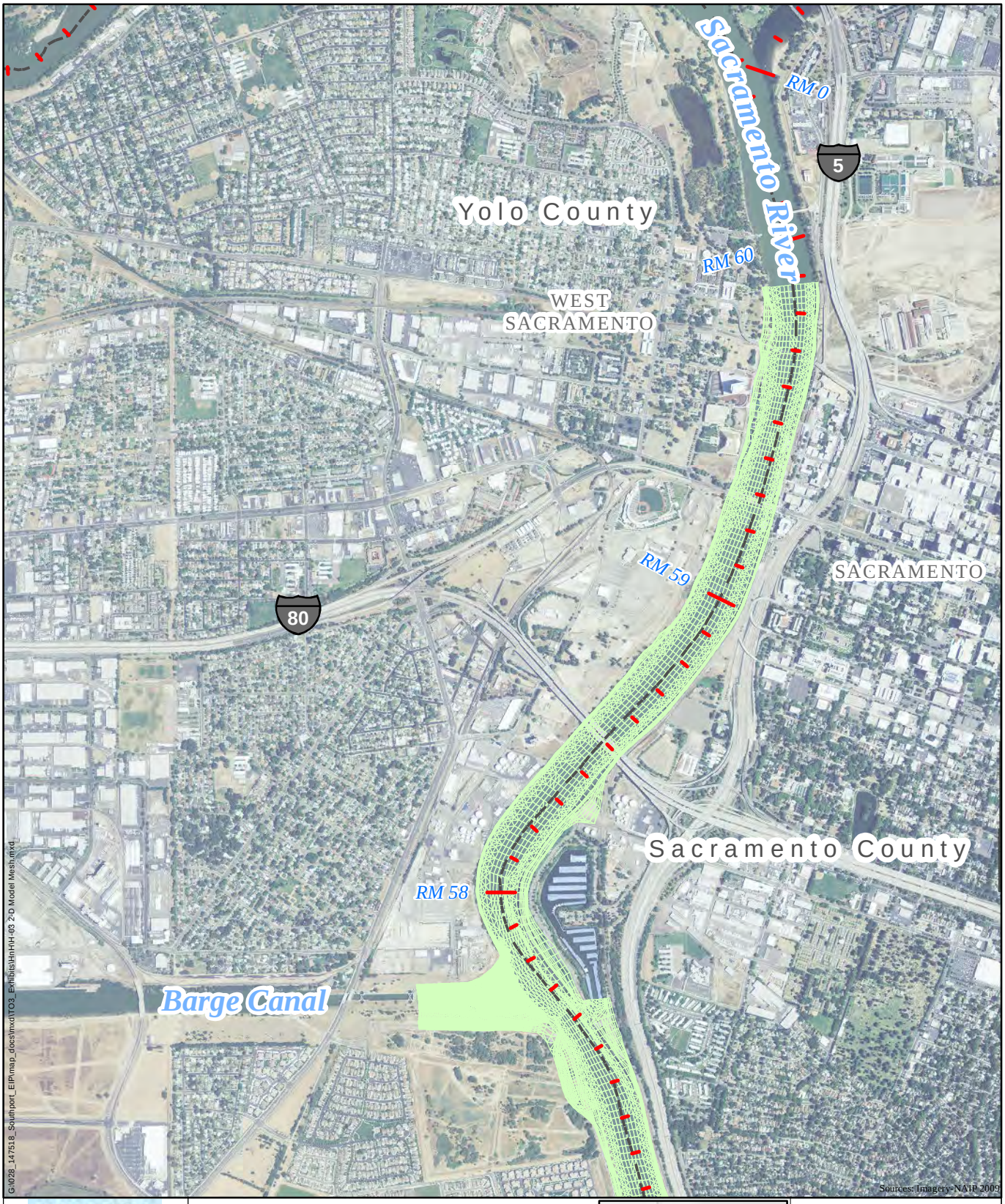
0 1 2 3

Miles
1 in = 3 miles



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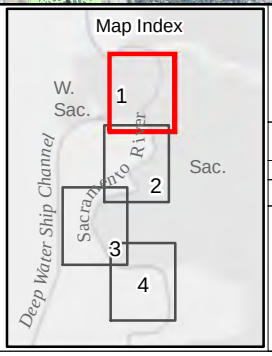
RM 45 River Miles Tics
Counties
Mesh

Map Index



2-D Model Mesh

Exhibit H-3

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Dec 2011

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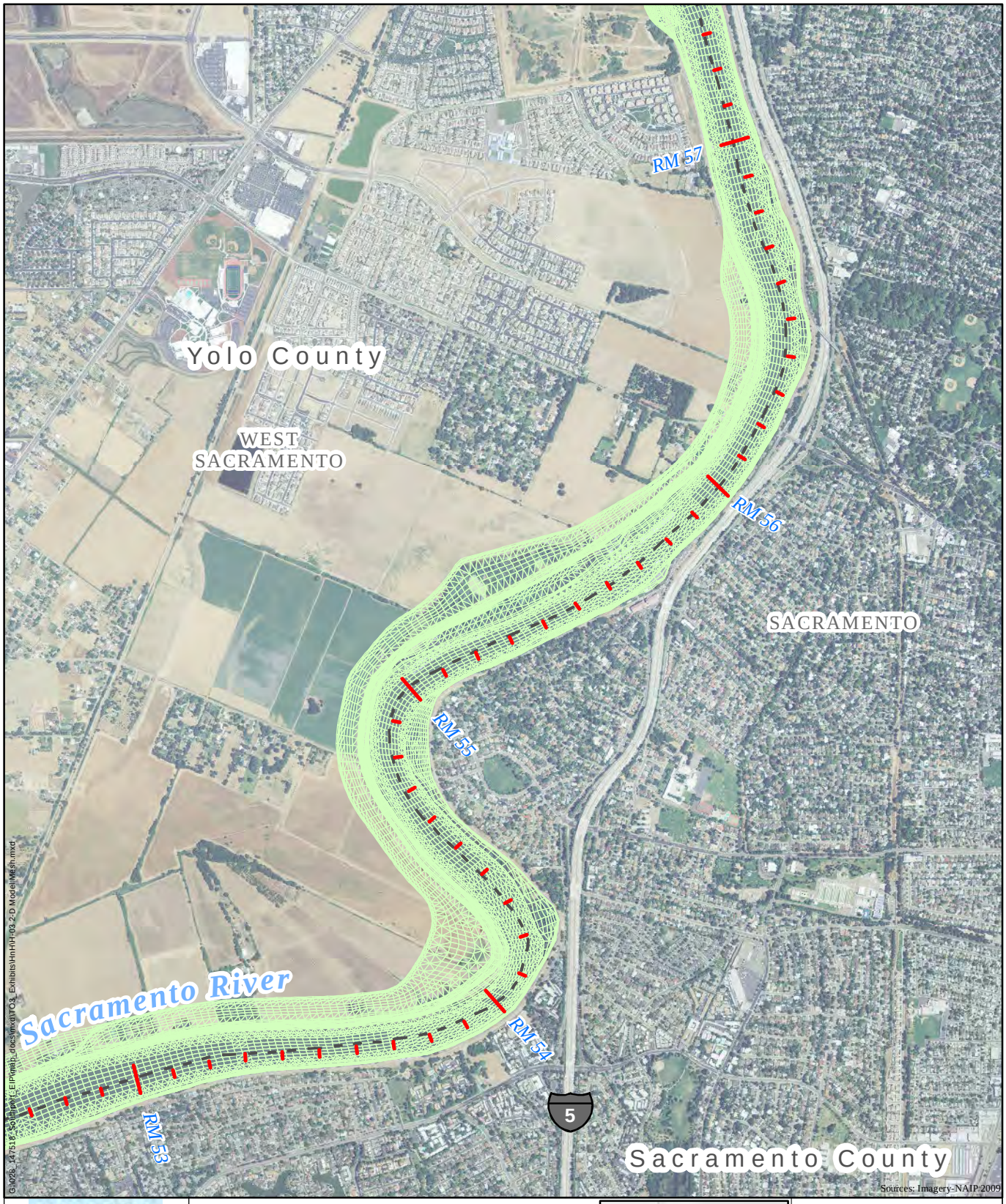
Feet
1 inch = 2,000 feet



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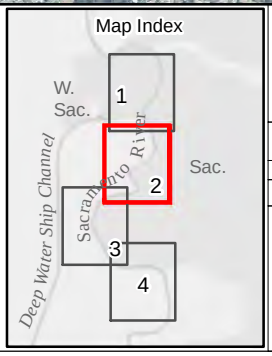
Counties
Mesh

Map Index



2-D Model Mesh

Exhibit H-3
Project Num: 453318-166505-028
Dec 2011

N
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S

0 1,000 2,000
Feet
1 inch = 2,000 feet

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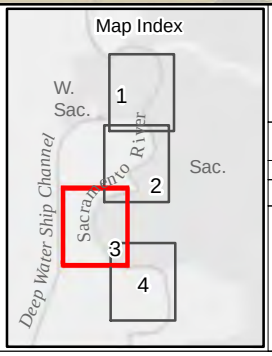
Counties
Mesh



2-D Model Mesh

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N W E S

0 1,000 2,000

Feet
1 inch = 2,000 feet

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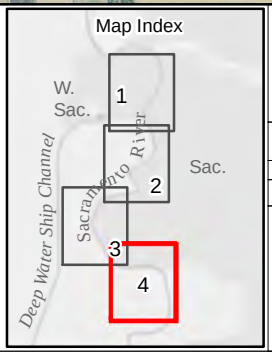

2-D Model Mesh

Exhibit H-3

Project Num: 453318-166505-028

Dec 2011

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Feet
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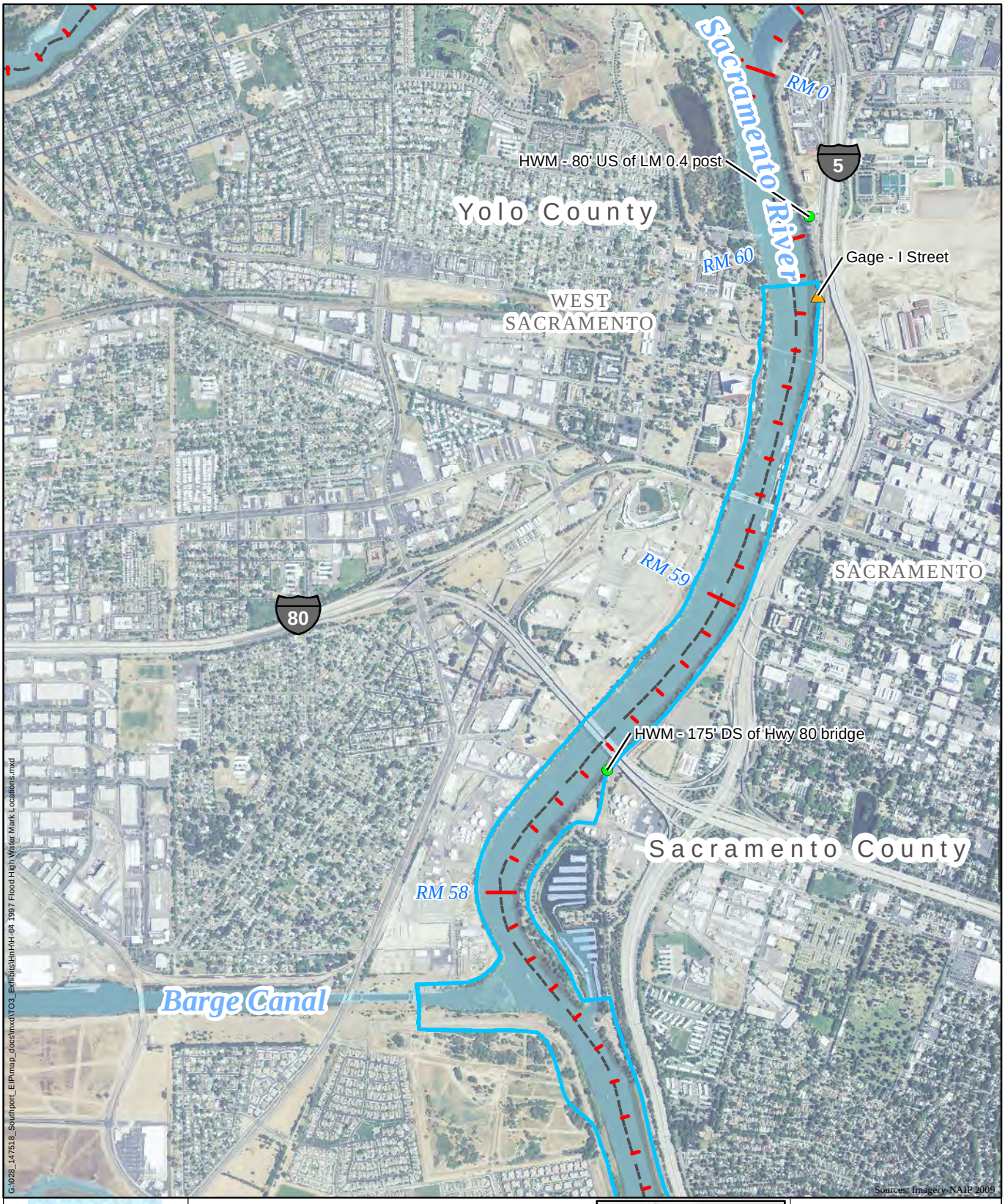

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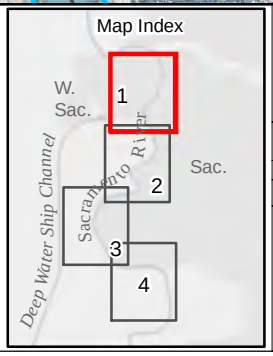
RM 45 River Mile Tics
Mesh Boundary
Counties
Waterways and Water Bodies
Flood1997
Gage
Surveyed High Water Mark

Map Index



1997 Flood High Water Mark Locations

Exhibit H-4

Project Num: 453318-166505-028

Dec 2011

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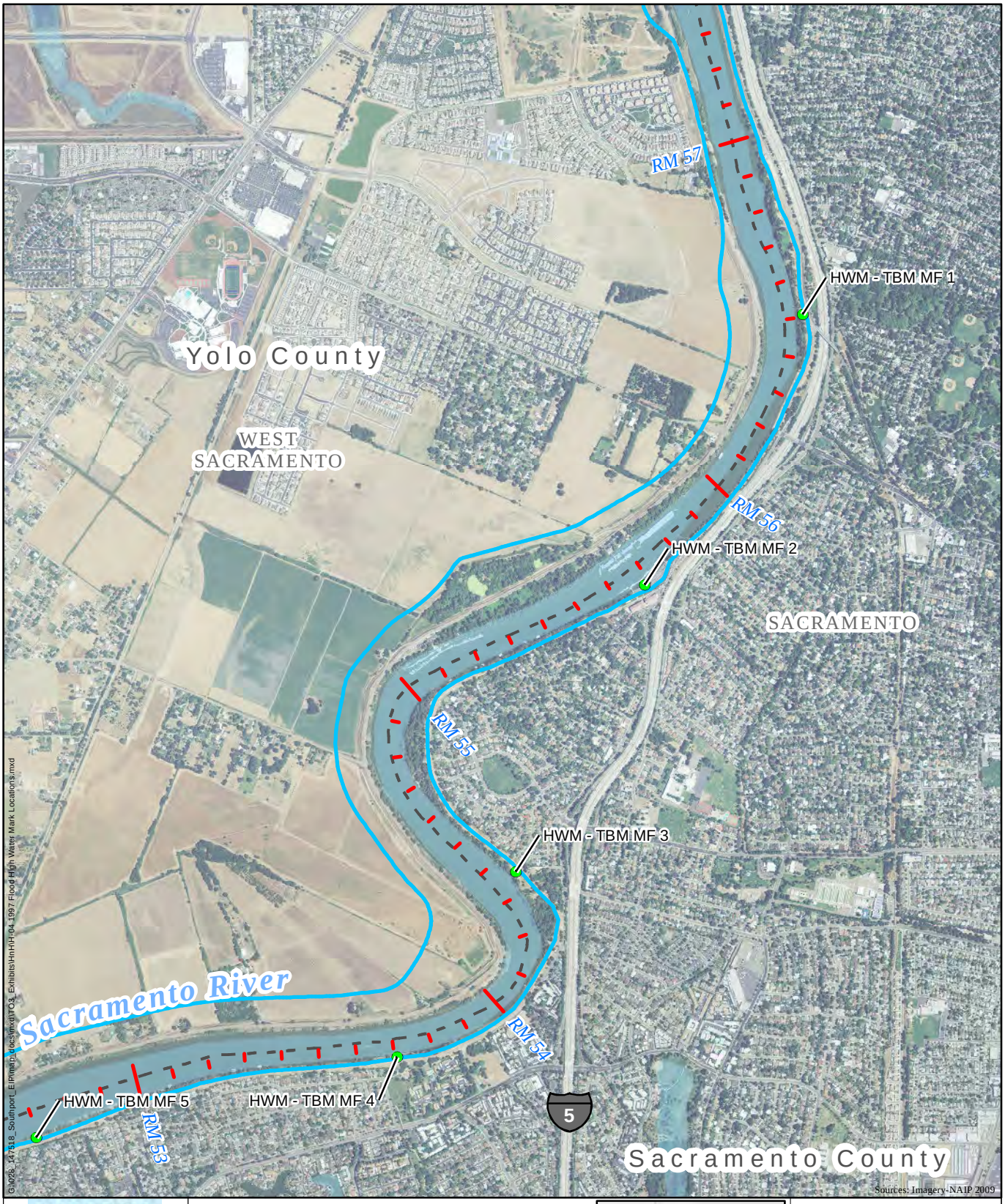
0 1,000 2,000

Feet
1 inch = 2,000 feet



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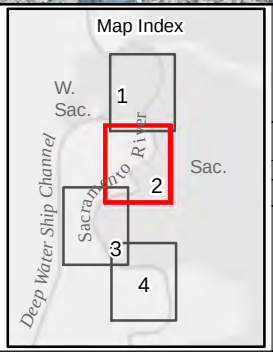

1997 Flood High Water Mark Locations

Exhibit H-4

Project Num: 453318-166505-028

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N W E S

0 1,000 2,000

Feet
1 inch = 2,000 feet

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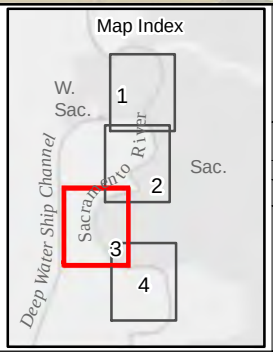

1997 Flood High Water Mark Locations

Exhibit H-4

Project Num: 453318-166505-028

Dec 2011

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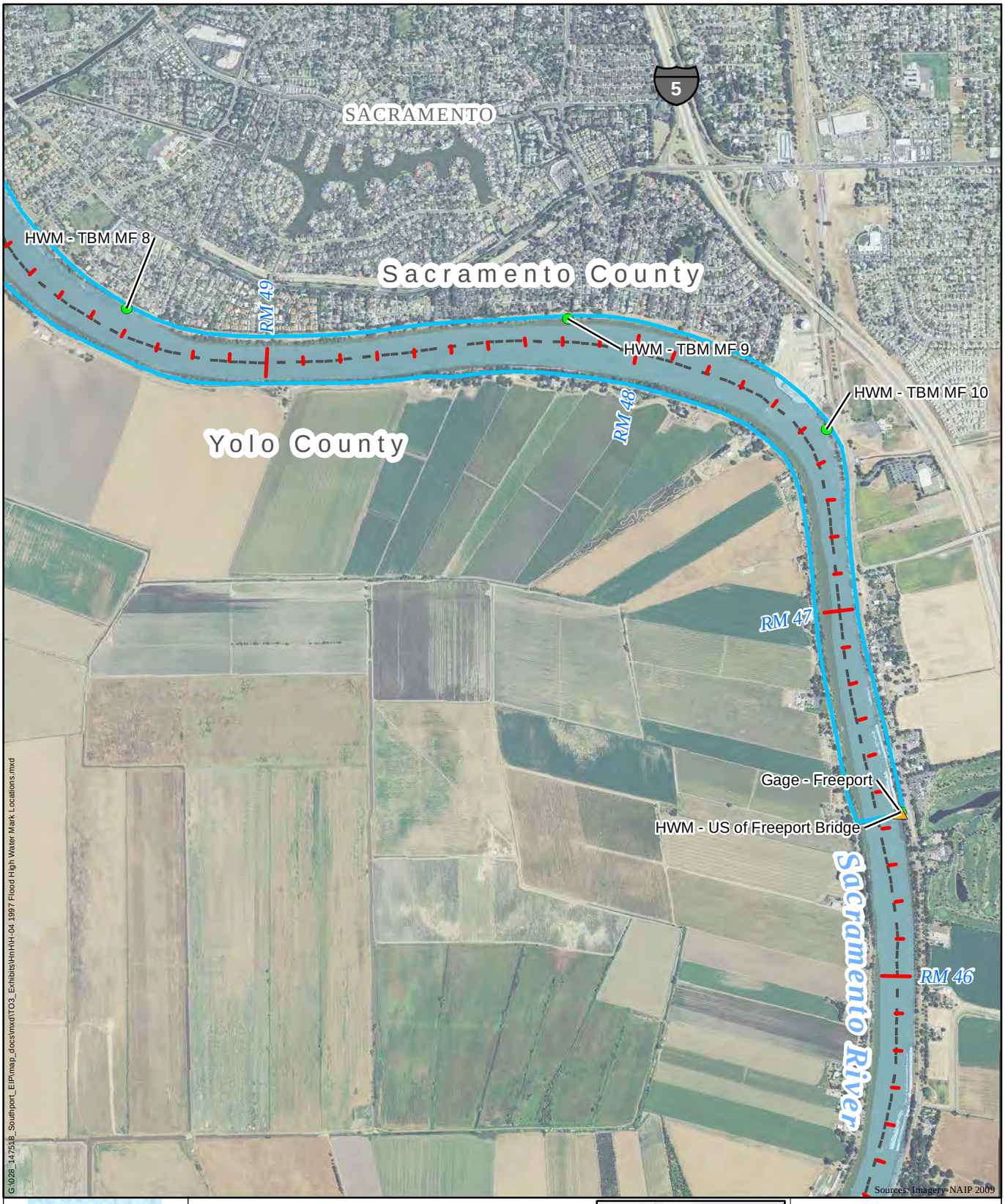
Feet
1 inch = 2,000 feet



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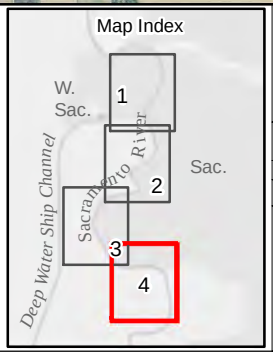


1997 Flood High Water Mark Locations

Exhibit H-4

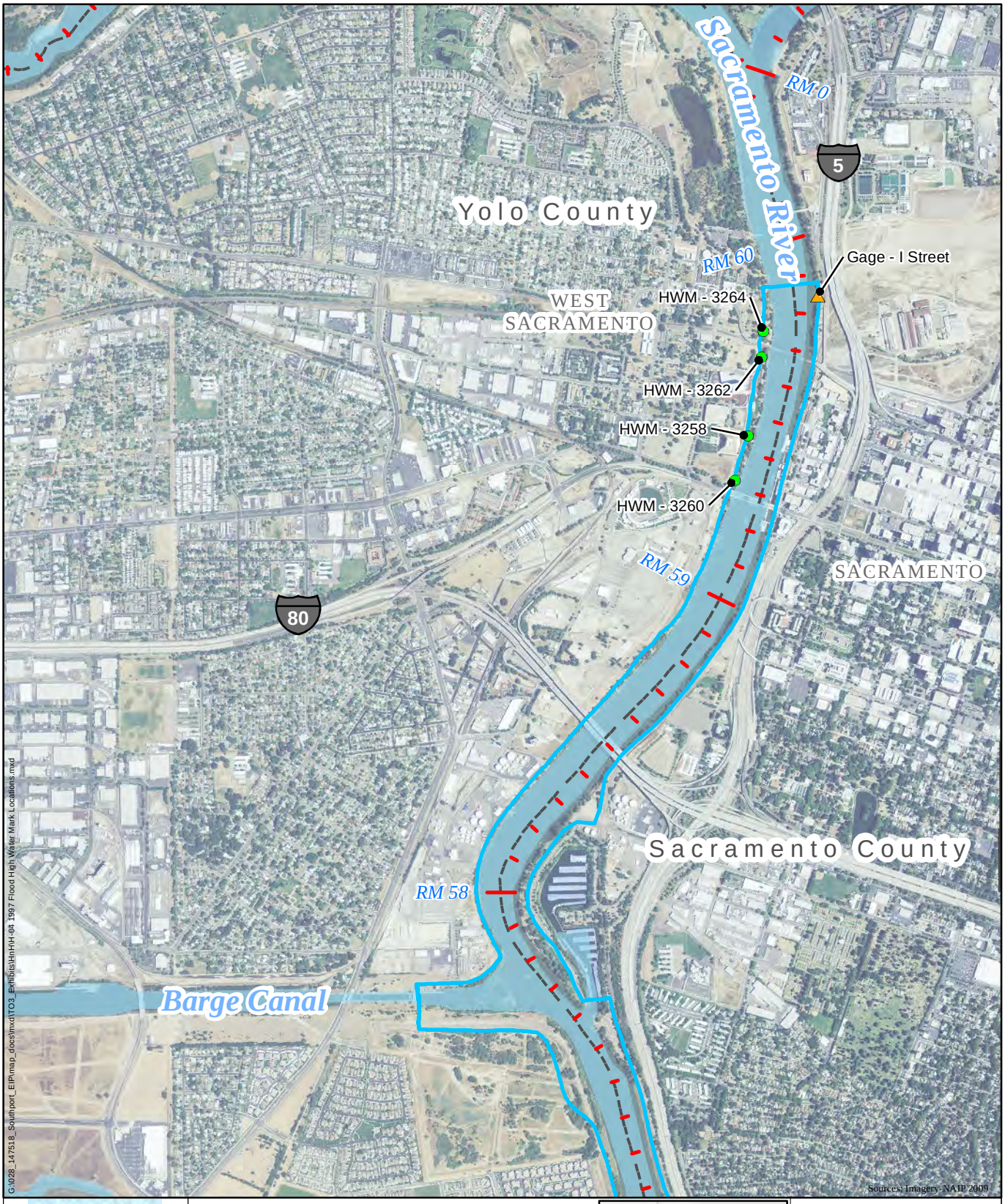
Project Num: 453318-166505-028

Dec 2011

N W E S

0 1,000 2,000

Feet
1 inch = 2,000 feet



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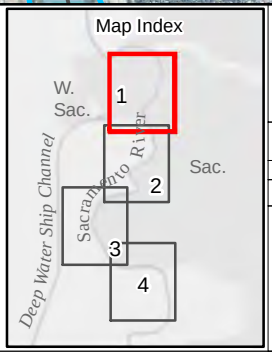
Counties
Waterways and Water Bodies
Mesh Boundary

Flood2006

Gage
Surveyed High Water Mark



2006 Flood High Water Mark Locations

Exhibit H-5

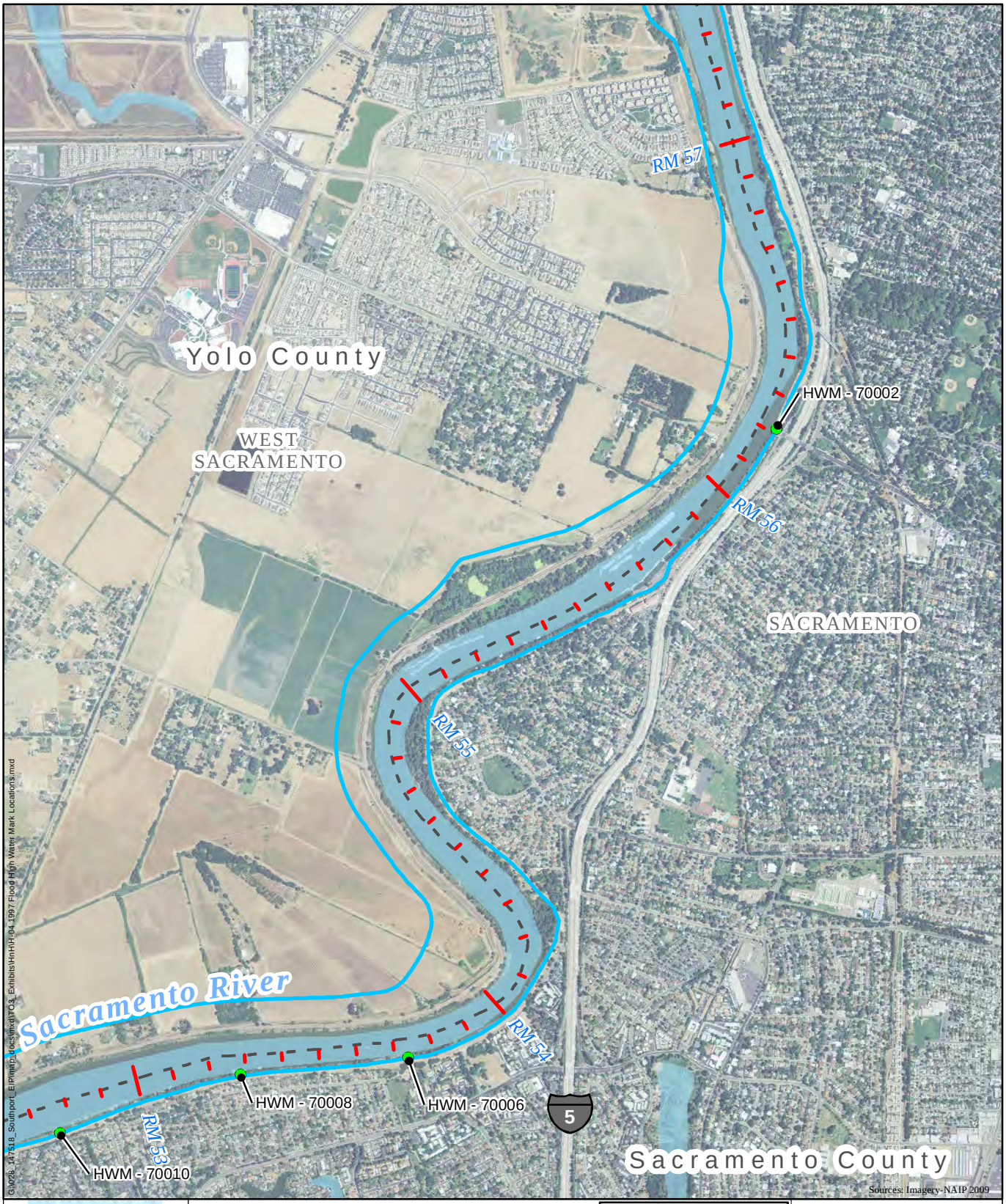
Project Num: 453318-166505-028

Dec 2011

N W E S

0 1,000 2,000

Feet
1 inch = 2,000 feet



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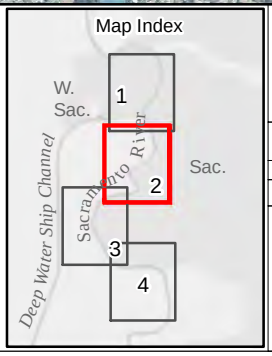
RM 45 River Miles Tics
Counties
Waterways and Water Bodies
Mesh Boundary

Flood2006

Gage
Surveyed High Water Mark

Map Index



2006 Flood High Water Mark Locations

Exhibit H-5

Project Num: 453318-166505-028

Dec 2011

N W E S

0 1,000 2,000

Feet
1 inch = 2,000 feet

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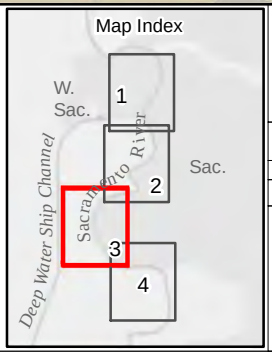
RM 45 River Miles Tics
Counties
Waterways and Water Bodies
Mesh Boundary

Flood2006

Gage
Surveyed High Water Mark



2006 Flood High Water Mark Locations

Exhibit H-5

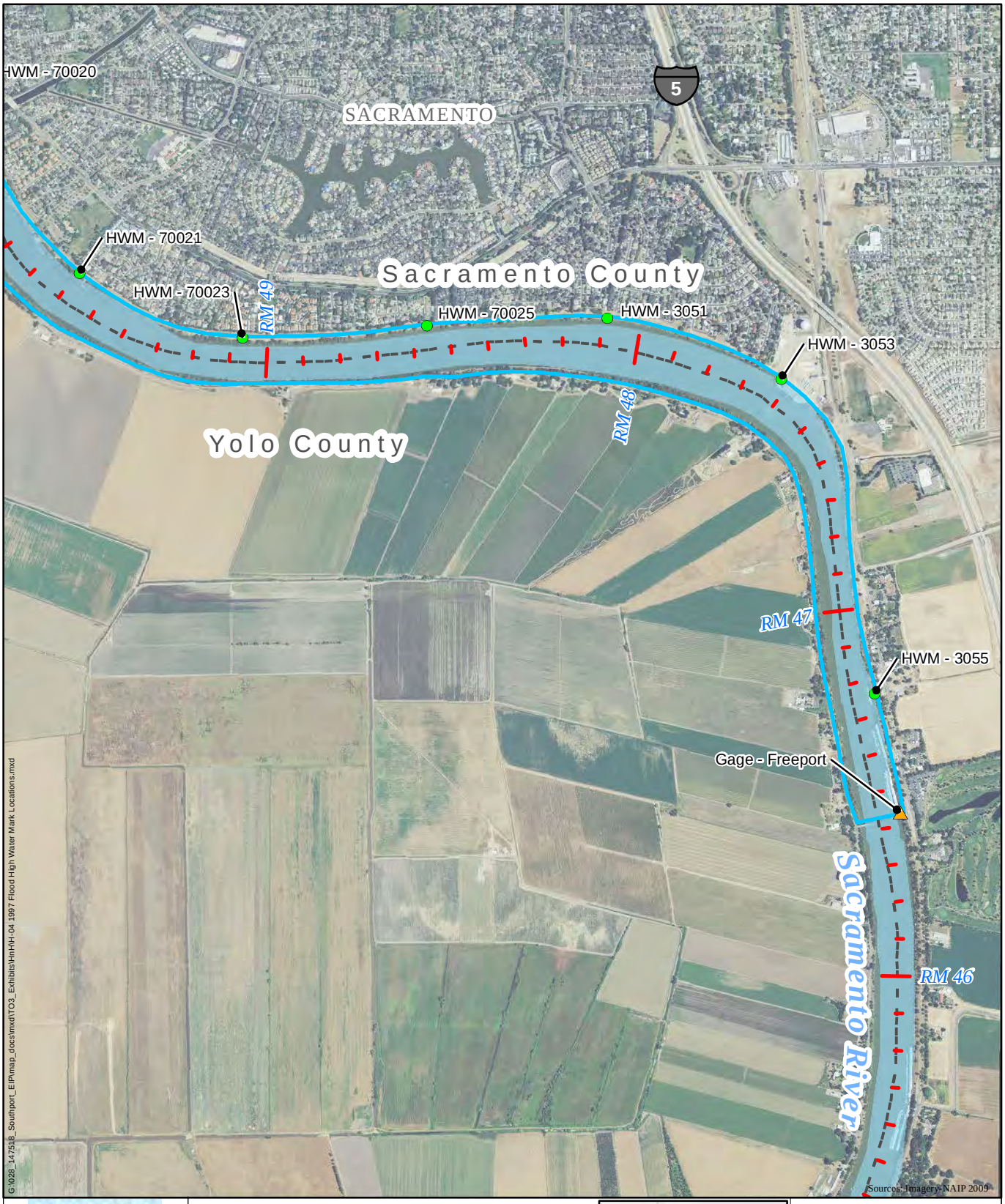
Project Num: 453318-166505-028

Dec 2011

N W E S

0 1,000 2,000

Feet
1 inch = 2,000 feet



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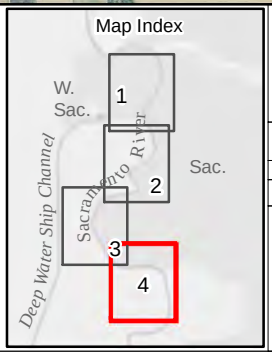
RM 45 River Miles Tics
Counties
Waterways and Water Bodies
Mesh Boundary

Flood2006

Gage
Surveyed High Water Mark



2006 Flood High Water Mark Locations

Exhibit H-5

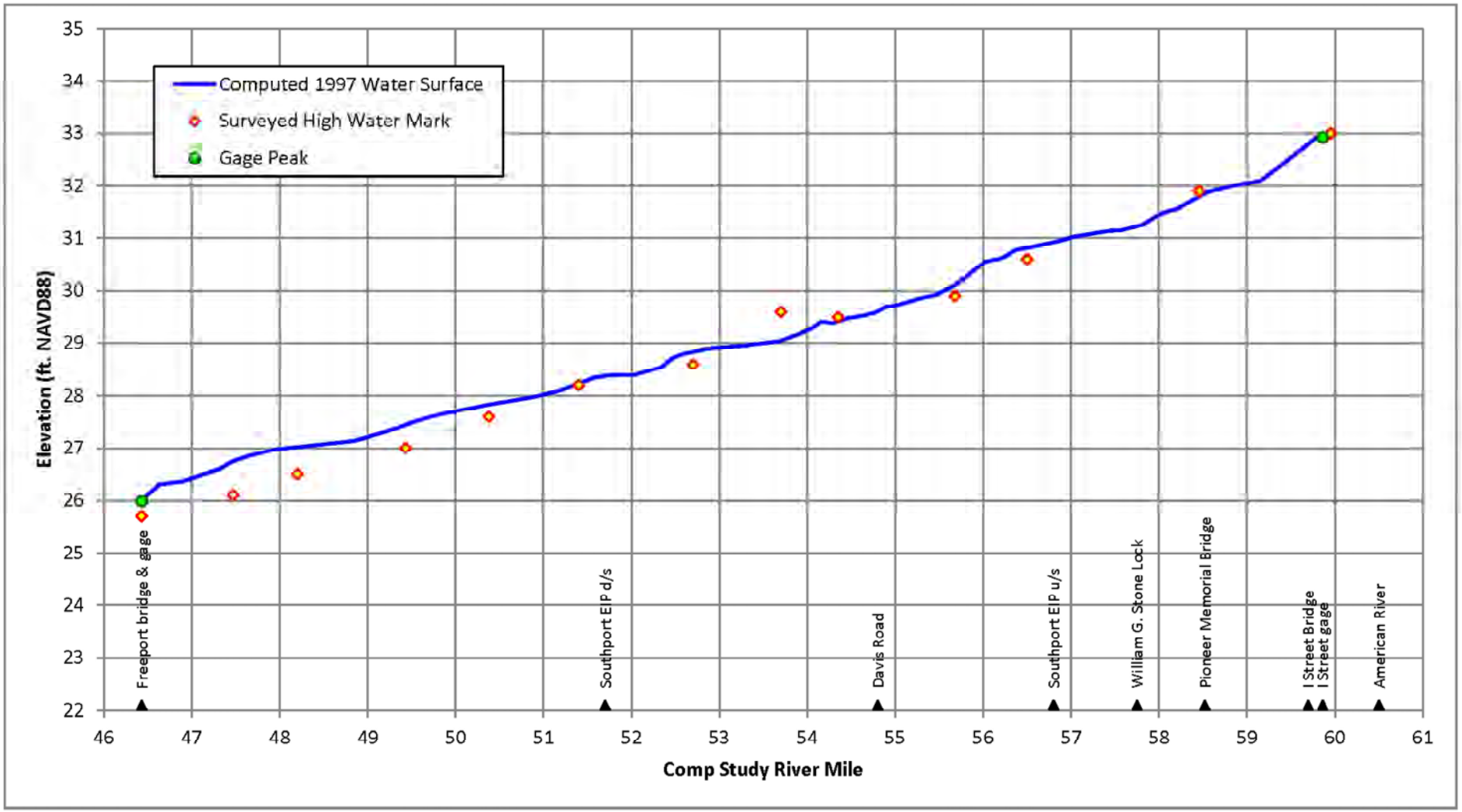
Project Num: 453318-166505-028

Dec 2011

N W E S

0 1,000 2,000

Feet
1 inch = 2,000 feet



G:\028_147518_Southport_EIP\map_docs\mxd\T03_Exhibits\HH\H-06 Calibration Water Surface Elevation Profile.mxd

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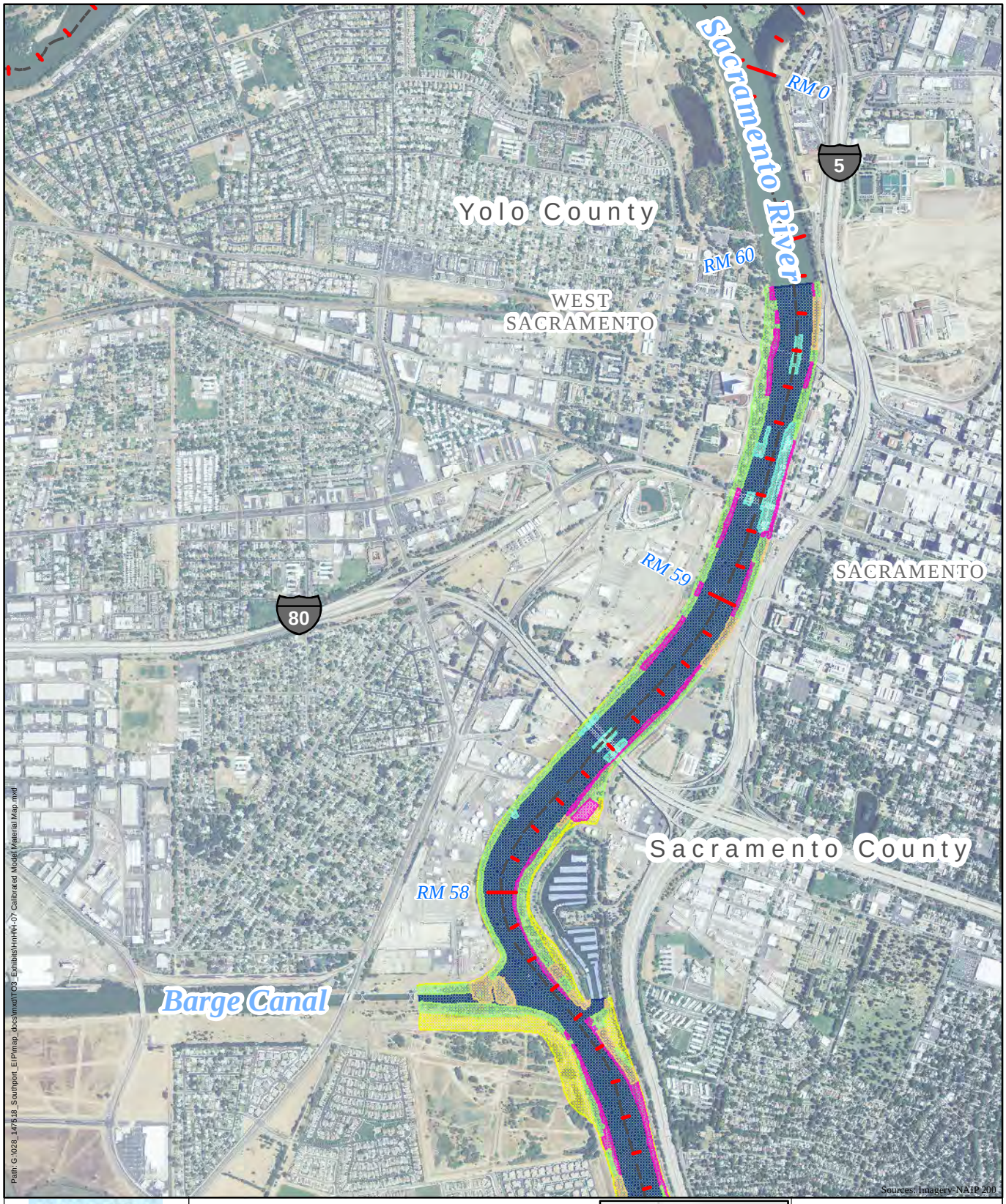
Calibration Water Surface Elevation Profile January 1997 Flood

Exhibit H-6

Project Num: 453318-166505-028

Dec 2011



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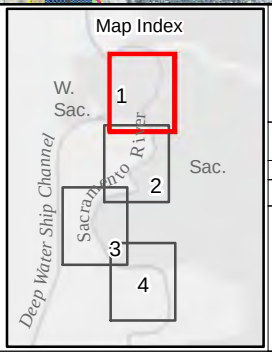
RM 45 River Mile Tics
Counties

Materials

- Disable
- Channel (n = 0.024)
- No brush (n = 0.03)
- Scattered trees (n = 0.045)
- Dense trees (n = 0.065)
- Marina (n = 0.18)

Map Index



Calibrated Model Material Map

Exhibit H-7

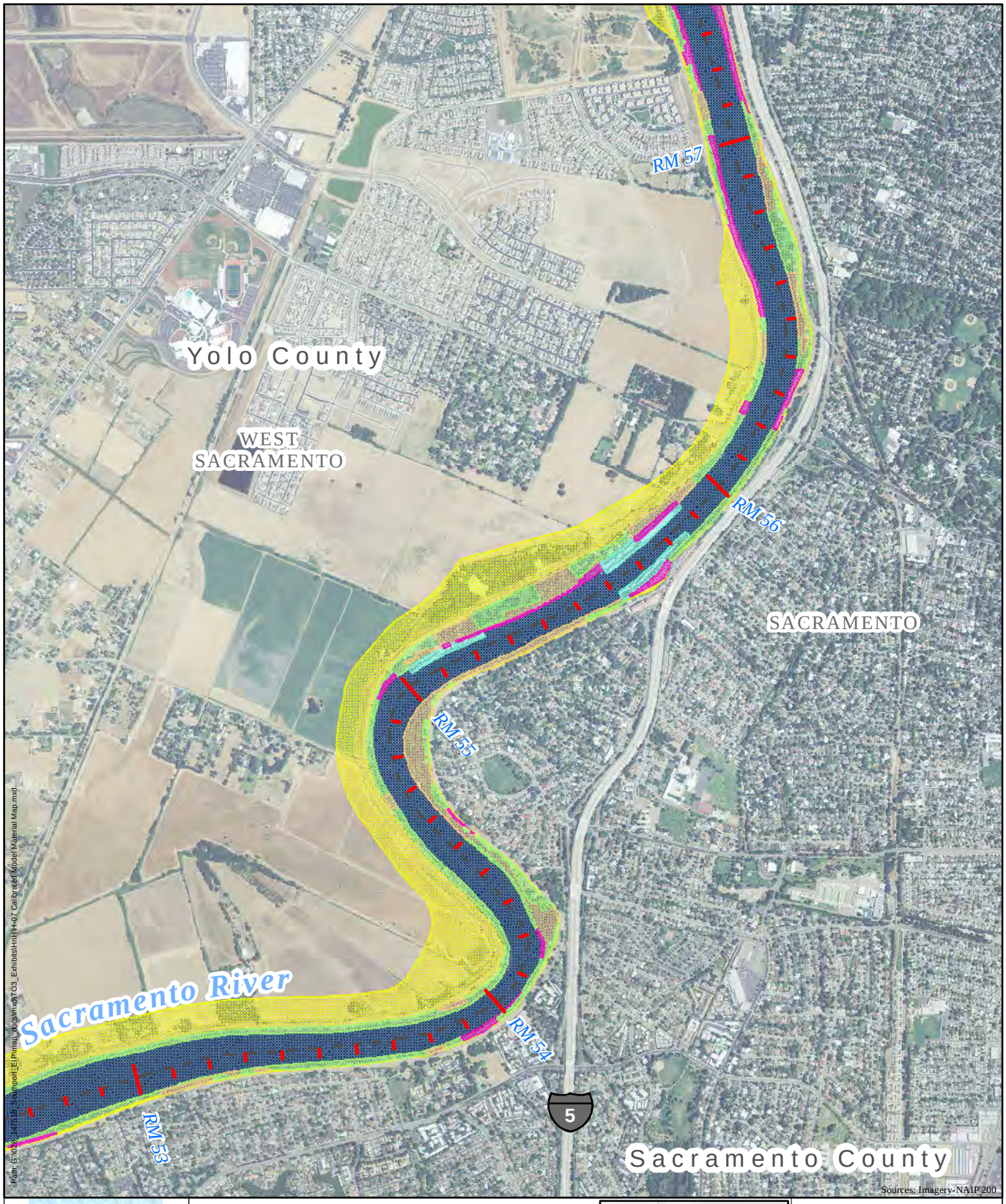
Project Num: 453318-166505-028

Dec 2011

N W E S

0 1,000 2,000

Feet
1 inch = 2,000 feet



WSAFCA
West Sacramento Area Flood Control Agency

Levee Improvement Program Southport Early Implementation Project

Project Manager
M. VECCHIO, HDR

Designed
M. ARCHER, MBK

Checked
B. JONES, HDR

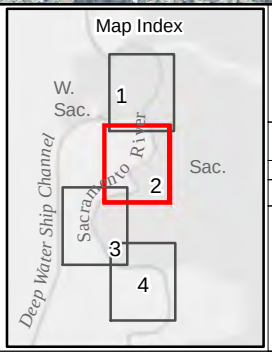
Drawn
C. PLOTTS, HDR

RM 45 River Mile Tics
Counties

Materials

- Disable
- Channel (n = 0.024)
- No brush (n = 0.03)
- Scattered trees (n = 0.045)
- Dense trees (n = 0.065)
- Marina (n = 0.18)

Map Index



Calibrated Model Material Map

Exhibit H-7

Project Num: 453318-166505-028

Dec 2011

N W E S

0 1,000 2,000

Feet
1 inch = 2,000 feet

WSAFCA
West Sacramento Area Flood Control Agency

Levee Improvement Program Southport Early Implementation Project

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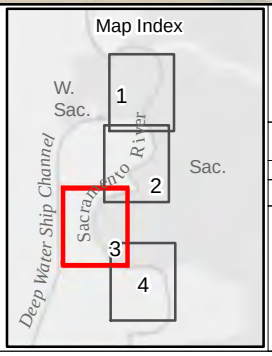
C. PLOTTS, HDR

RM 45 River Mile Tics
Counties

Materials

- Disable
- Channel (n = 0.024)
- No brush (n = 0.03)
- Scattered trees (n = 0.045)
- Dense trees (n = 0.065)
- Marina (n = 0.18)



Calibrated Model Material Map

Exhibit H-7

Project Num: 453318-166505-028

Dec 2011

N W E S

0 1,000 2,000

Feet

1 inch = 2,000 feet

WSAFCA
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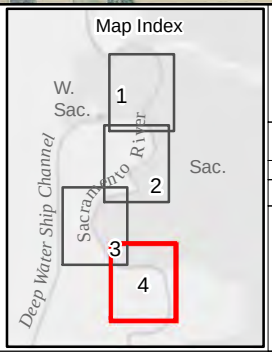
C. PLOTTS, HDR

RM 45 River Mile Tics
Counties

Materials

- Disable
- Channel (n = 0.024)
- No brush (n = 0.03)
- Scattered trees (n = 0.045)
- Dense trees (n = 0.065)
- Marina (n = 0.18)



Calibrated Model Material Map

Exhibit H-7

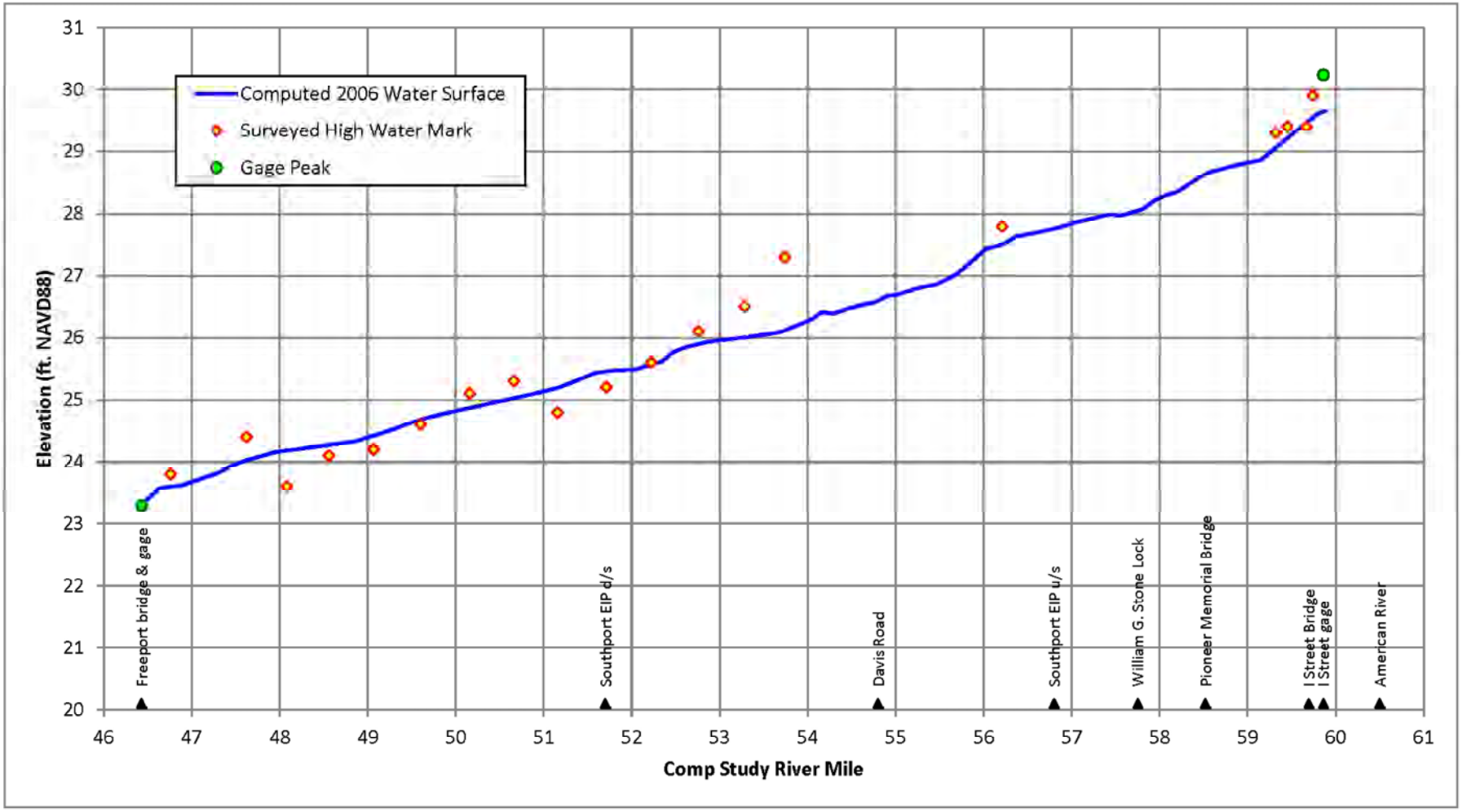
Project Num: 453318-166505-028

Dec 2011

N
W E
S

0 1,000 2,000

Feet
1 inch = 2,000 feet



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Levee Improvement Program
Southport Early
Implementation Project

Project Manager
M. VECCHIO, HDR

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M. ARCHER, MBK

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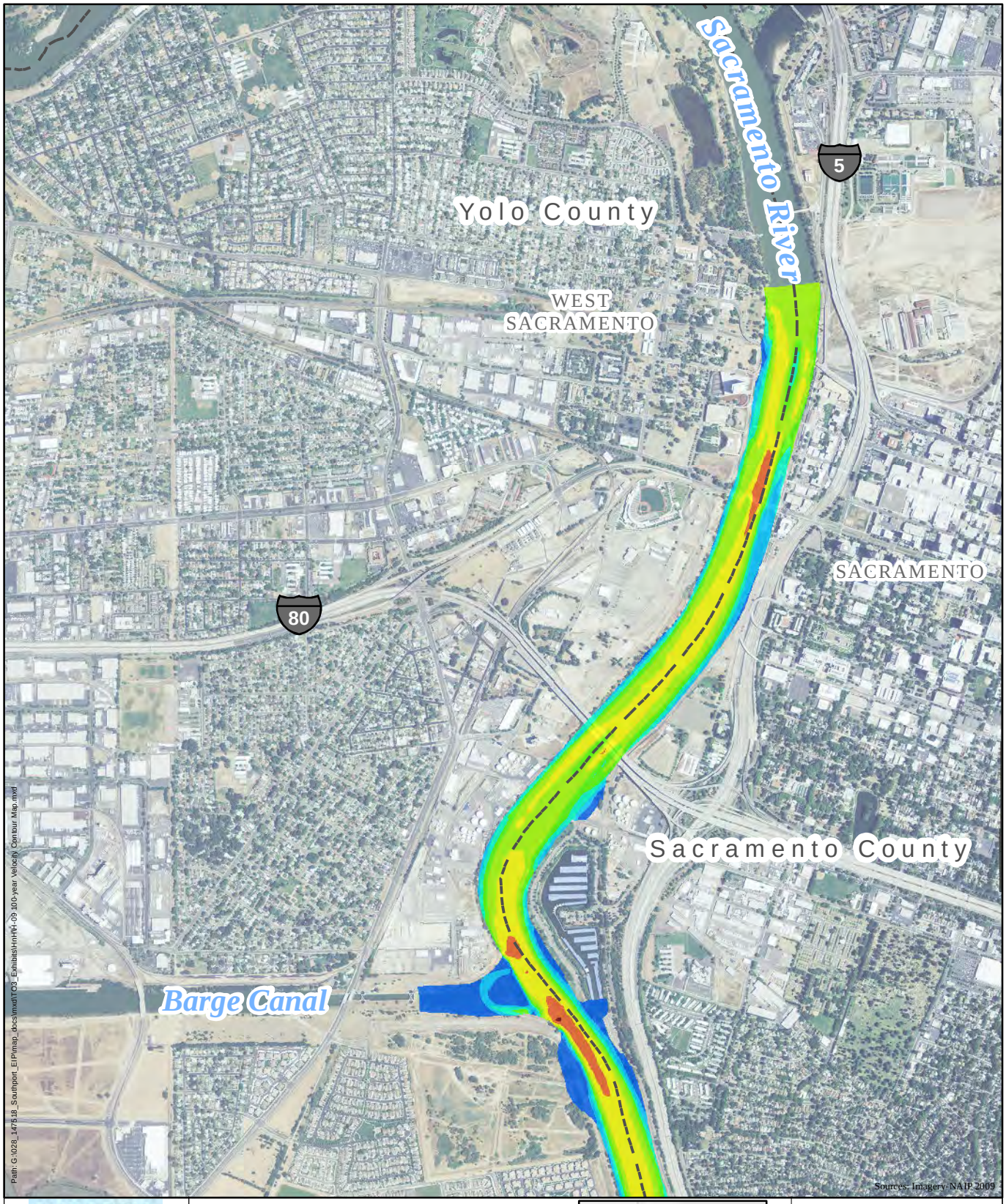
Drawn
C. PLOTTS, HDR

Verification Water Surface Elevation Profile January 2006 Flood

Exhibit H-8

Project Num: 453318-166505-028

Dec 2011



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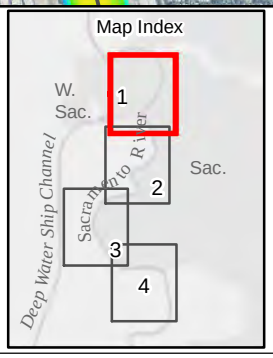
Drawn
C. PLOTTS, HDR

Counties

Velocity (fps)

- 0 to 1.0
- 1.0 to 2.0
- 2.0 to 3.0
- 3.0 to 4.0
- 4.0 to 5.0
- 5.0 to 6.0
- 6.0 to 7.0
- 7.0 to 8.0
- Greater than 7.0

Map Index



Velocity Contour map 100-year Flood Event

Exhibit H-9

Project Num: 453318-166505-028

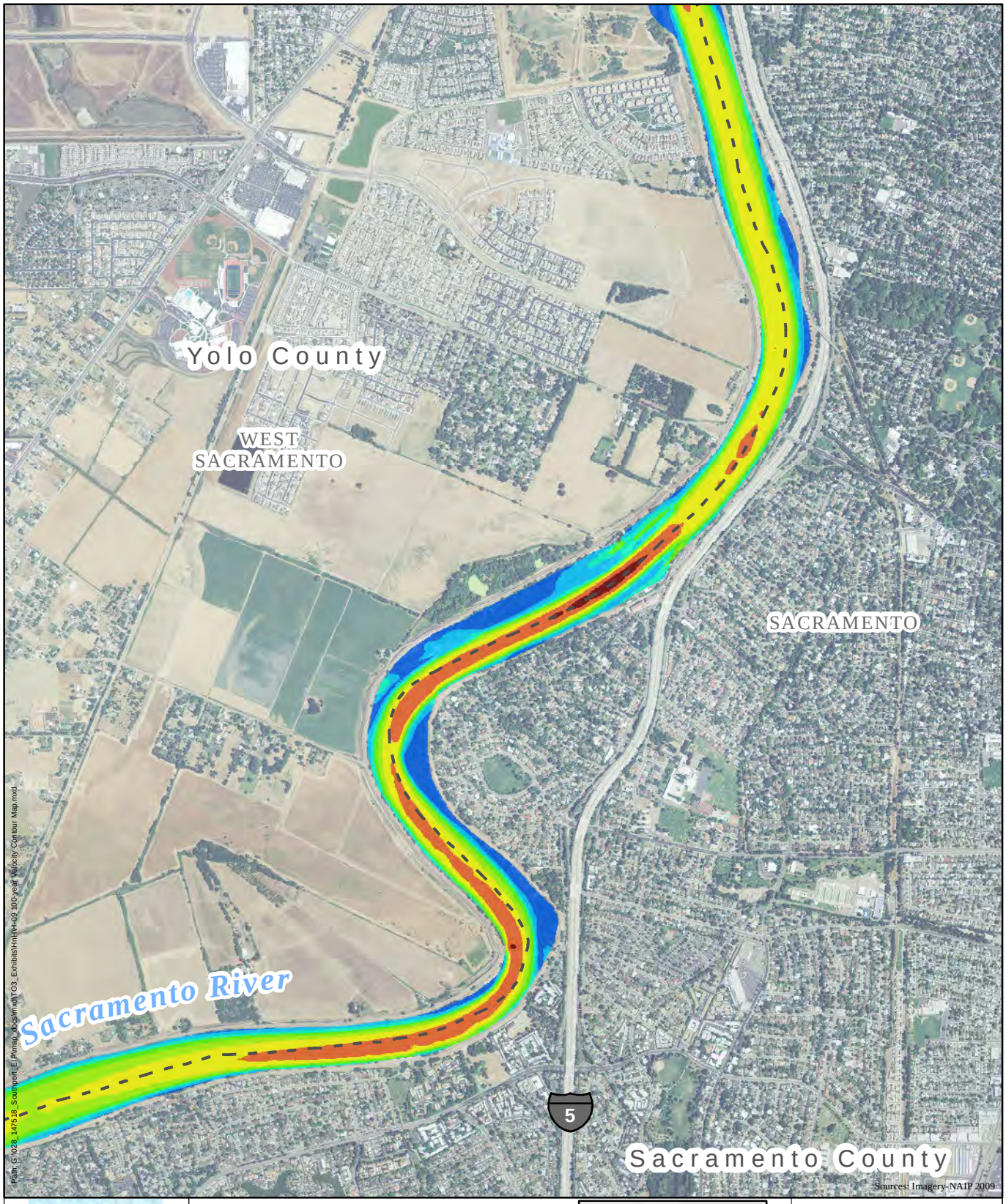
Dec 2011

N W E S

0 1,000 2,000

Feet

1 inch = 2,000 feet



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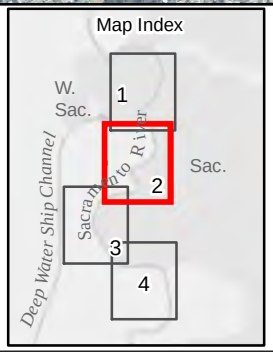
Counties

Velocity (fps)

- 0 to 1.0
- 1.0 to 2.0
- 2.0 to 3.0
- 3.0 to 4.0
- 4.0 to 5.0
- 5.0 to 6.0
- 6.0 to 7.0
- 7.0 to 8.0
- Greater than 7.0

Map Index



Velocity Contour map 100-year Flood Event

Exhibit H-9

Project Num: 453318-166505-028

Dec 2011

N W E S

0 1,000 2,000

Feet

1 inch = 2,000 feet

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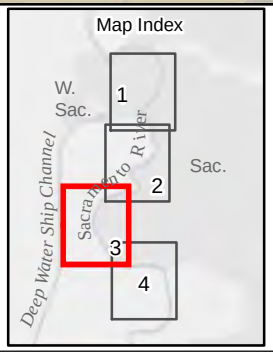
Counties

Velocity (fps)

- 0 to 1.0
- 1.0 to 2.0
- 2.0 to 3.0
- 3.0 to 4.0
- 4.0 to 5.0
- 5.0 to 6.0
- 6.0 to 7.0
- 7.0 to 8.0
- Greater than 7.0

Map Index



Velocity Contour map 100-year Flood Event

Exhibit H-9

Project Num: 453318-166505-028

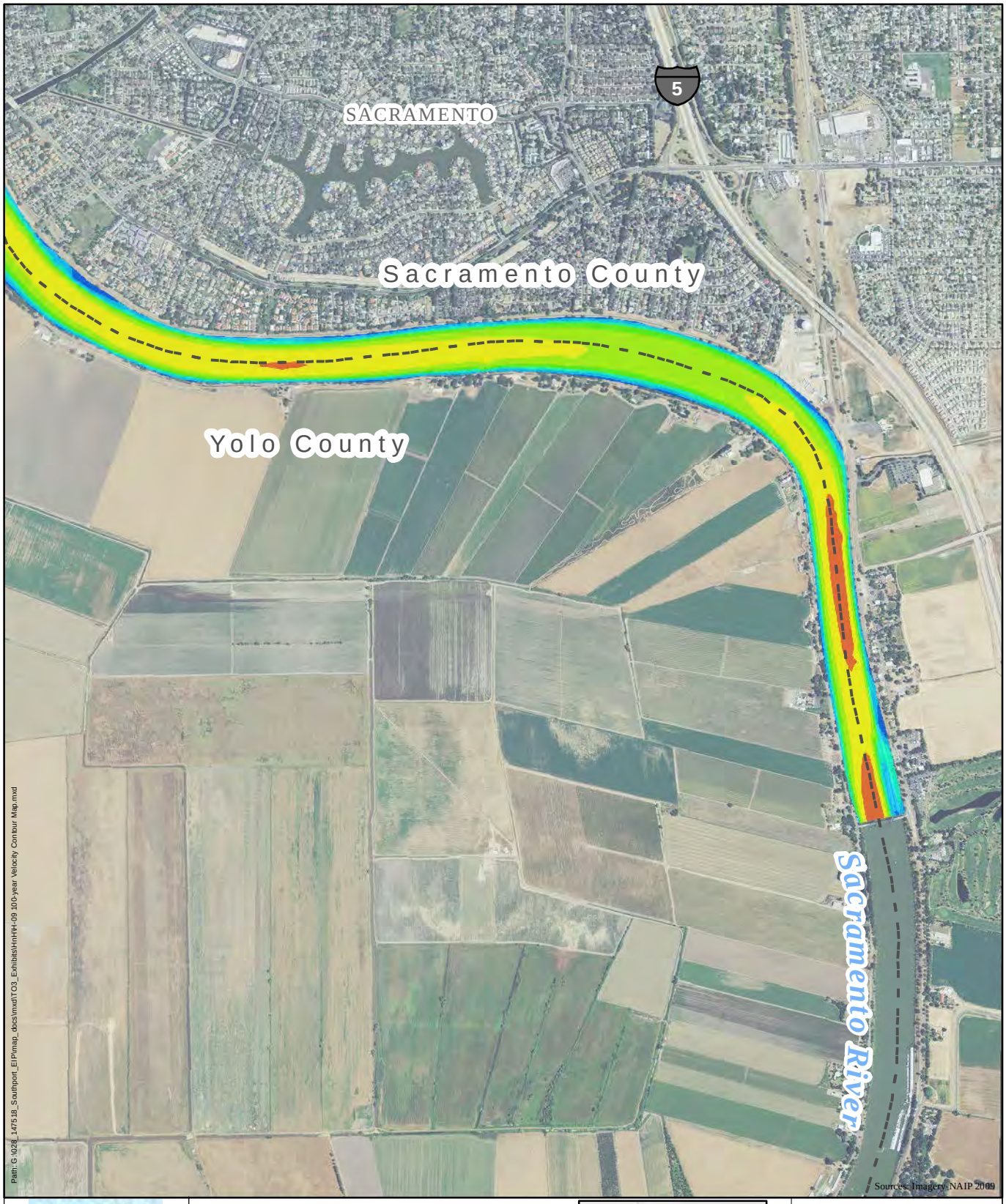
Dec 2011

N W E S

0 1,000 2,000

Feet

1 inch = 2,000 feet



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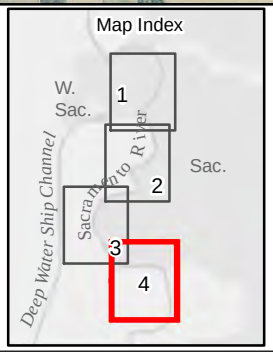
Counties

Velocity (fps)

- 0 to 1.0
- 1.0 to 2.0
- 2.0 to 3.0
- 3.0 to 4.0
- 4.0 to 5.0
- 5.0 to 6.0
- 6.0 to 7.0
- 7.0 to 8.0
- Greater than 7.0

Map Index



Velocity Contour map 100-year Flood Event

Exhibit H-9

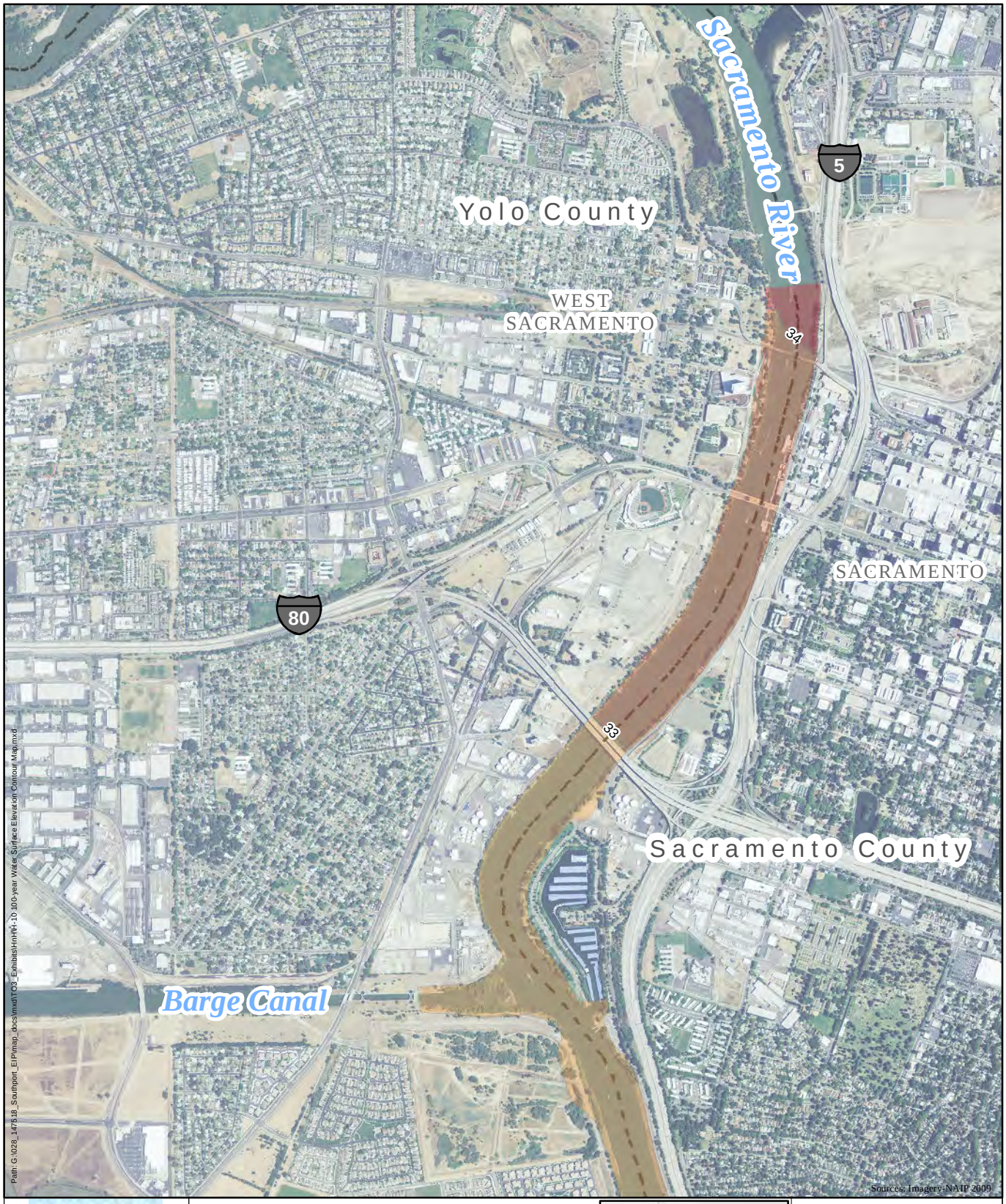
Project Num: 453318-166505-028

Dec 2011

N W E S

0 1,000 2,000

Feet
1 inch = 2,000 feet



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Levee Improvement Program Southport Early Implementation Project

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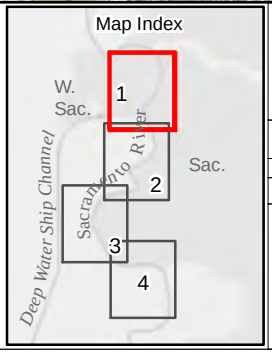
Counties

Vertical Datum feet NAVD88

Map Index



Water Surface Elevation Contour map 100-year Flood Event

Exhibit H-10

Project Num: 453318-166505-028

Dec 2011

N W E S

0 1,000 2,000

Feet
1 inch = 2,000 feet

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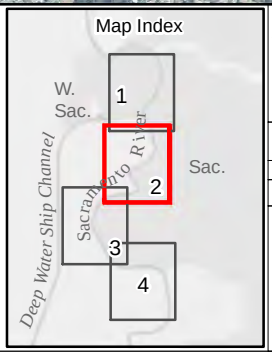
Counties

Vertical Datum feet NAVD88



Water Surface Elevation Contour map 100-year Flood Event

Exhibit H-10

Project Num: 453318-166505-028

Dec 2011

N
W E
S

0 1,000 2,000

Feet
1 inch = 2,000 feet

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Levee Improvement Program Southport Early Implementation Project

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Checked
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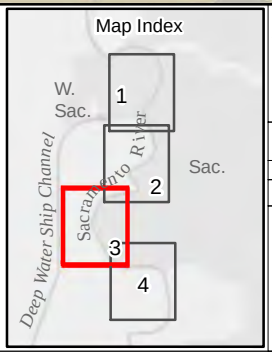
Drawn
C. PLOTTS, HDR

Counties

Vertical Datum feet NAVD88



Water Surface Elevation Contour map 100-year Flood Event

Exhibit H-10

Project Num: 453318-166505-028

Dec 2011

N W E S

0 1,000 2,000

Feet

1 inch = 2,000 feet

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Levee Improvement Program Southport Early Implementation Project

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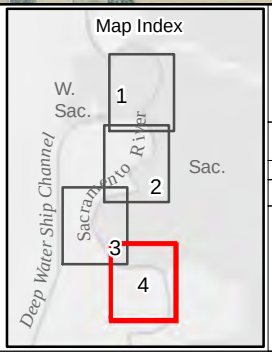
C. PLOTTS, HDR

Counties

Vertical Datum feet NAVD88

Map Index



Water Surface Elevation Contour map 100-year Flood Event

Exhibit H-10

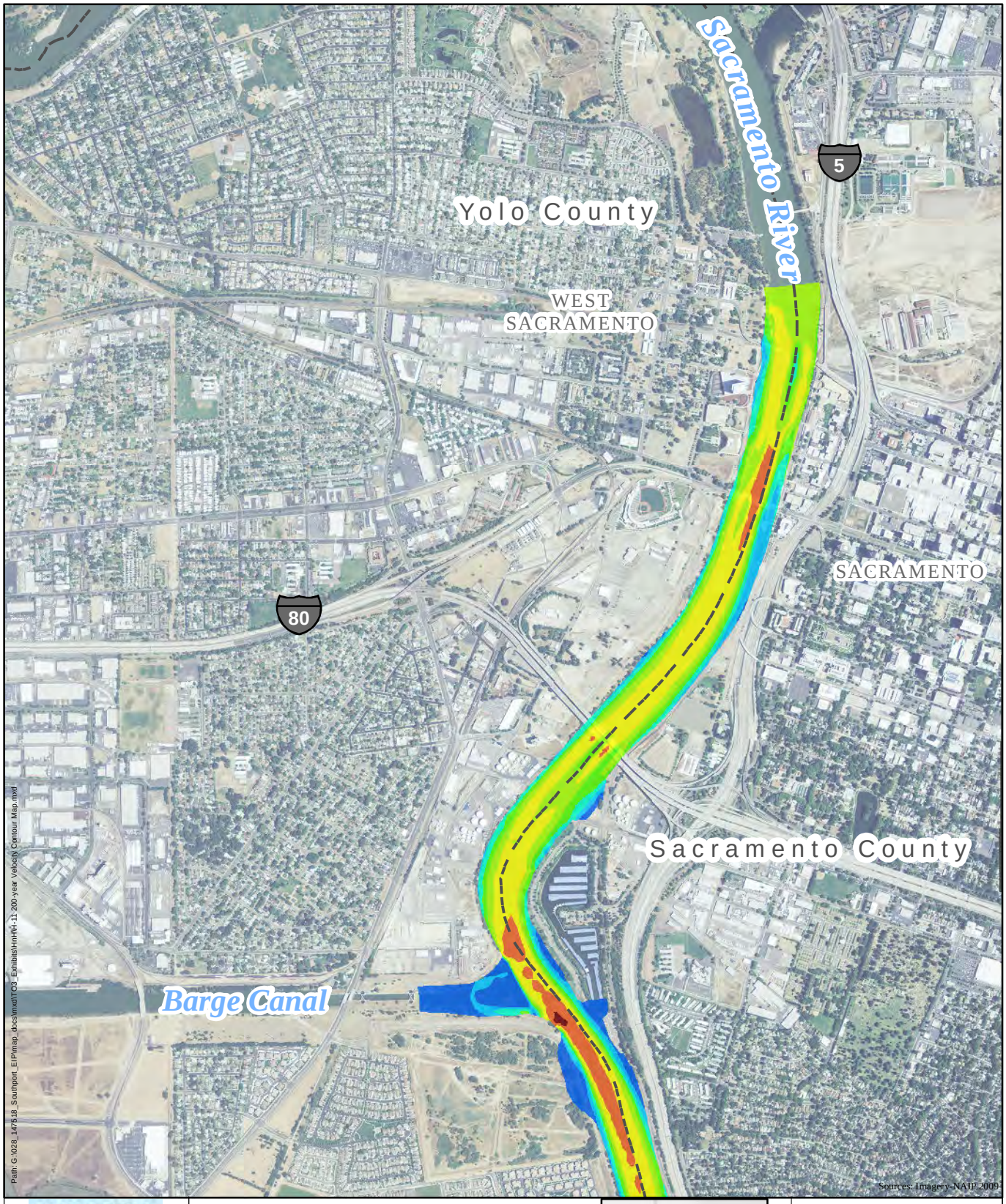
Project Num: 453318-166505-028

Dec 2011

N
W E
S

0 1,000 2,000

Feet
1 inch = 2,000 feet



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Levee Improvement Program Southport Early Implementation Project

Project Manager
M. VECCHIO, HDR

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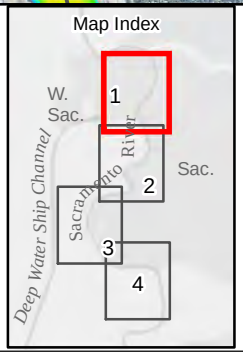
C. PLOTTS, HDR

Counties

Velocity (fps)

- 0 to 1.0
- 1.0 to 2.0
- 2.0 to 3.0
- 3.0 to 4.0
- 4.0 to 5.0
- 5.0 to 6.0
- 6.0 to 7.0
- 7.0 to 8.0
- Greater than 7.0

Map Index



Velocity Contour map 200-year Flood Event

Exhibit H-11

Project Num: 453318-166505-028

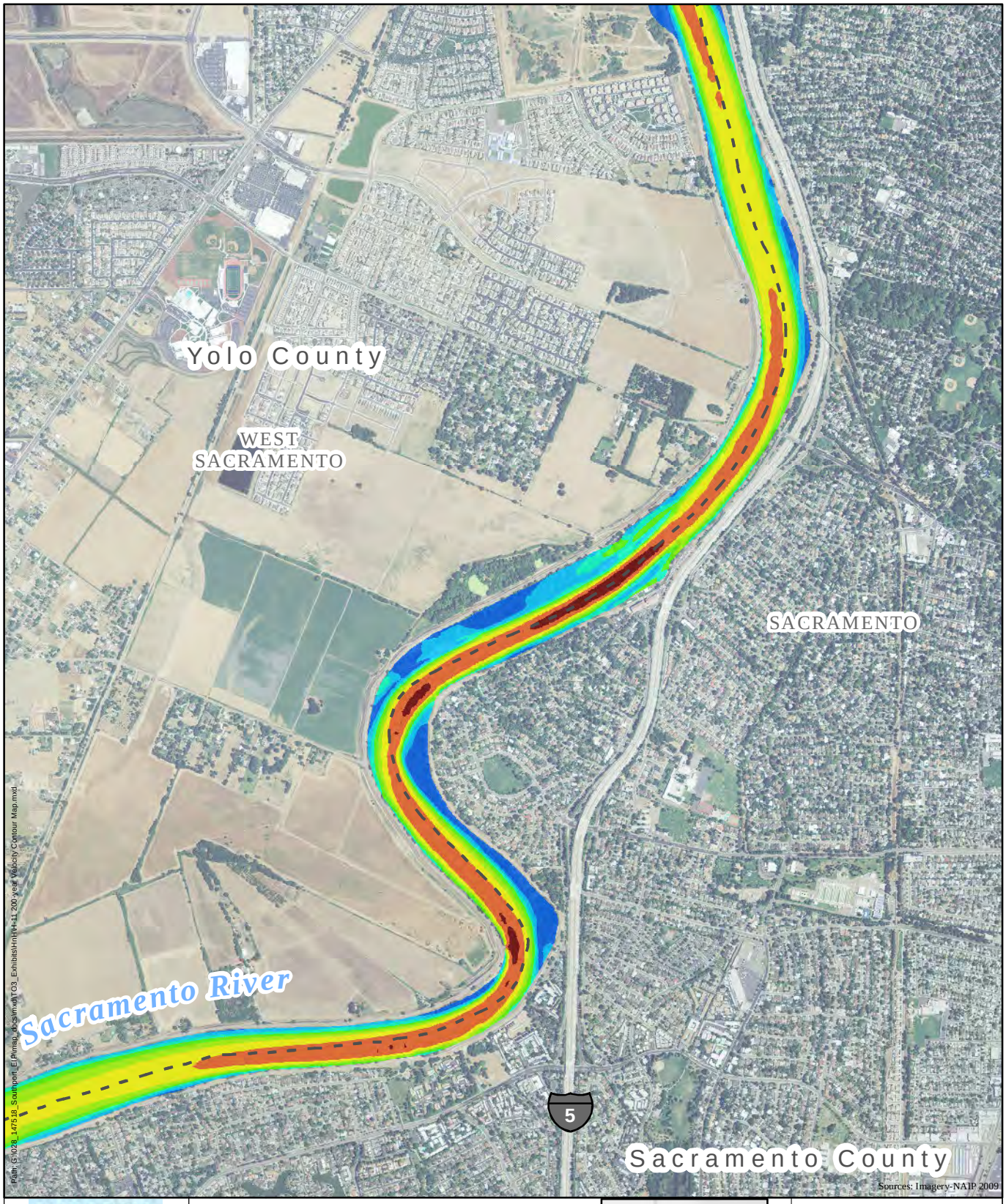
Dec 2011

N W E S

0 1,000 2,000

Feet

1 inch = 2,000 feet



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Levee Improvement Program Southport Early Implementation Project

Project Manager
M. VECCHIO, HDR

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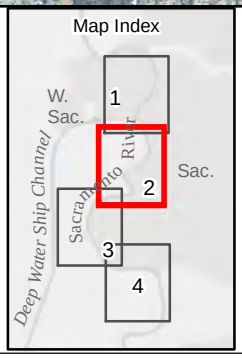
Counties

Velocity (fps)

- 0 to 1.0
- 1.0 to 2.0
- 2.0 to 3.0
- 3.0 to 4.0
- 4.0 to 5.0
- 5.0 to 6.0
- 6.0 to 7.0
- 7.0 to 8.0
- Greater than 7.0

Map Index



Velocity Contour map 200-year Flood Event

Exhibit H-11

Project Num: 453318-166505-028

Dec 2011

N W E S

0 1,000 2,000

Feet
1 inch = 2,000 feet

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West Sacramento Area Flood Control Agency

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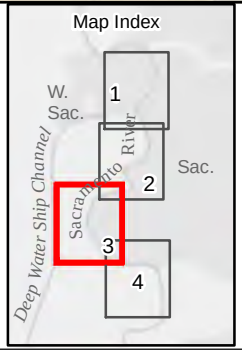
Counties

Velocity (fps)

- 0 to 1.0
- 1.0 to 2.0
- 2.0 to 3.0
- 3.0 to 4.0
- 4.0 to 5.0
- 5.0 to 6.0
- 6.0 to 7.0
- 7.0 to 8.0
- Greater than 7.0

Map Index



Velocity Contour map 200-year Flood Event

Exhibit H-11

Project Num: 453318-166505-028

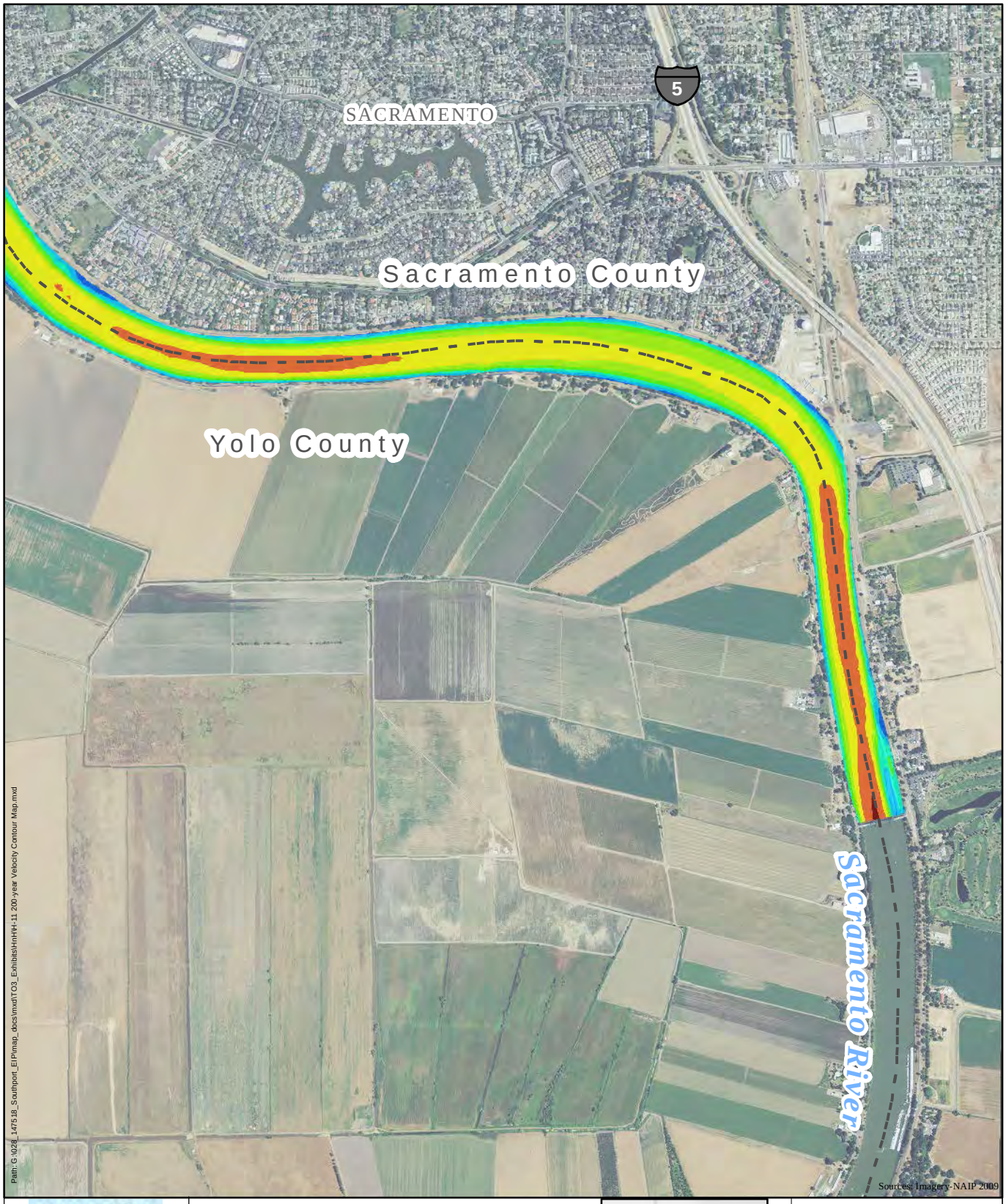
Dec 2011

N W E S

0 1,000 2,000

Feet

1 inch = 2,000 feet



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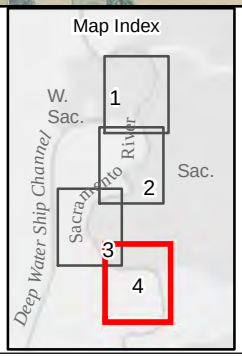
Counties

Velocity (fps)

- 0 to 1.0
- 1.0 to 2.0
- 2.0 to 3.0
- 3.0 to 4.0
- 4.0 to 5.0
- 5.0 to 6.0
- 6.0 to 7.0
- 7.0 to 8.0
- Greater than 7.0

Map Index



Velocity Contour map 200-year Flood Event

Exhibit H-11

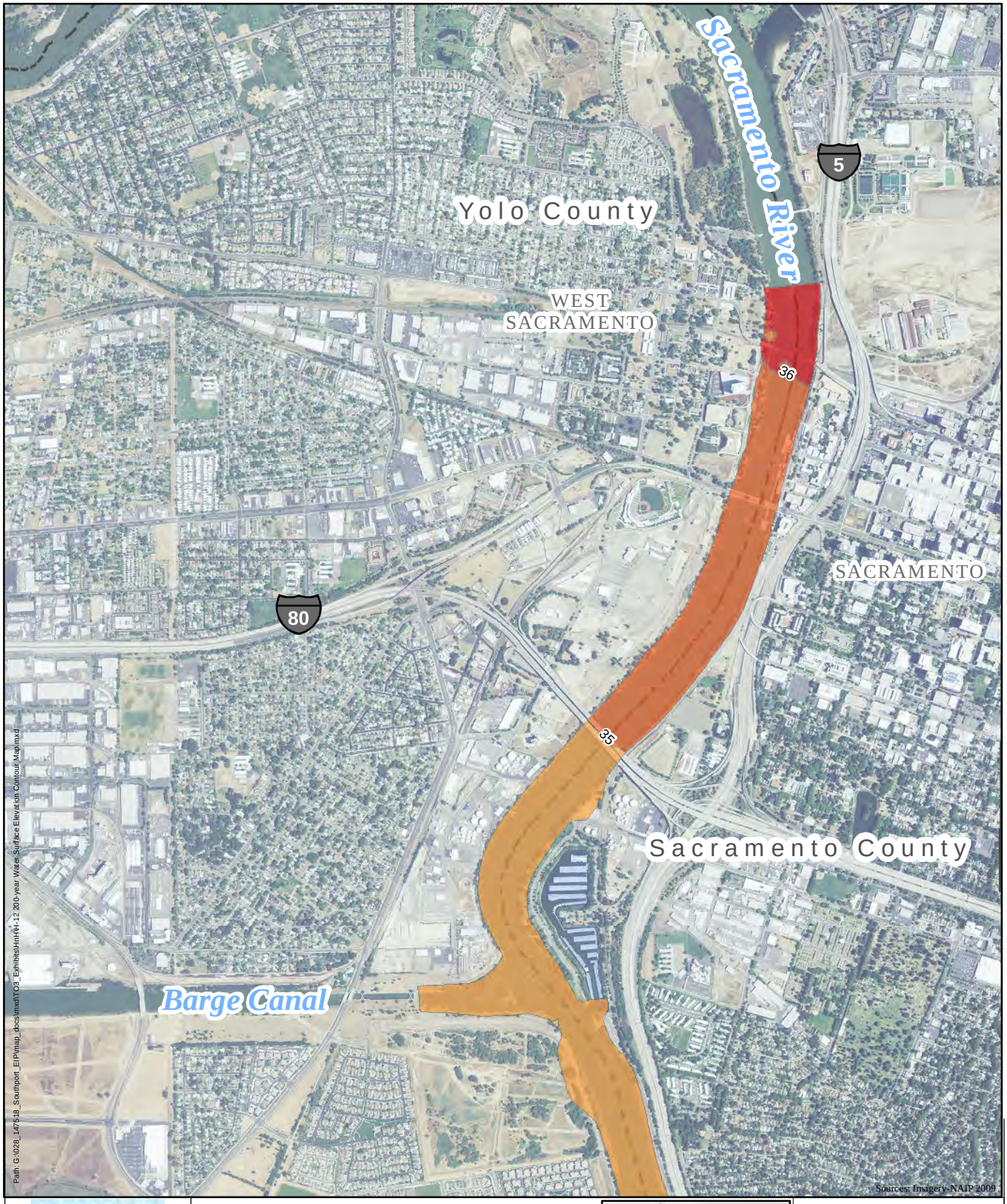
Project Num: 453318-166505-028

Dec 2011

N W E S

0 1,000 2,000

Feet
1 inch = 2,000 feet



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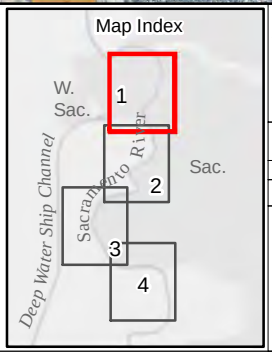
Counties
Vertical Datum feet NAVD88

Map Index



Water Surface Elevation Contour map 200-year Flood Event

Exhibit H-12

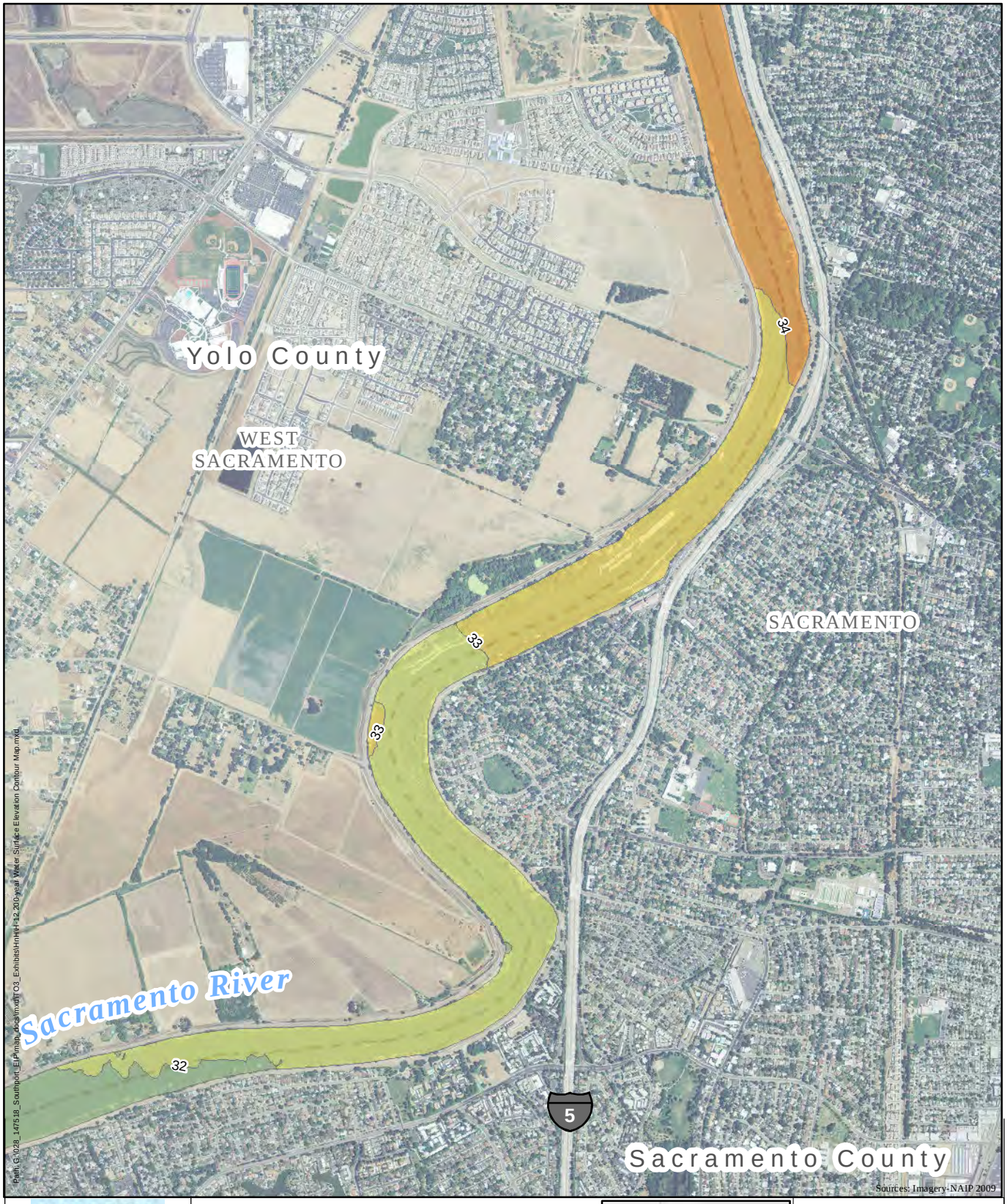
Project Num: 453318-166505-028

Dec 2011

N W E S

0 1,000 2,000

Feet
1 inch = 2,000 feet



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Levee Improvement Program Southport Early Implementation Project

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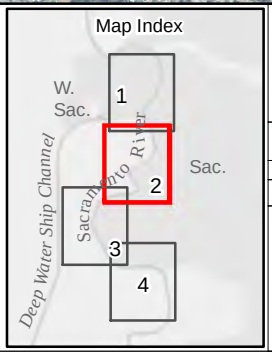
Counties
Vertical Datum feet NAVD88



Water Surface Elevation Contour map 200-year Flood Event

Exhibit H-12

Project Num: 453318-166505-028

Dec 2011

N W E S

0 1,000 2,000

Feet
1 inch = 2,000 feet

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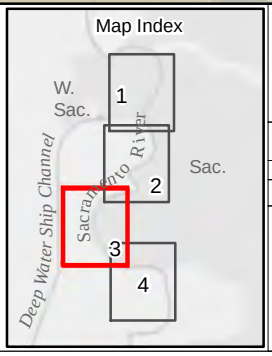
Drawn
C. PLOTTS, HDR

Counties
Vertical Datum feet NAVD88



Water Surface Elevation Contour map 200-year Flood Event

Exhibit H-12

Project Num: 453318-166505-028

Dec 2011

N
W E
S

0 1,000 2,000
Feet
1 inch = 2,000 feet

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Levee Improvement Program Southport Early Implementation Project

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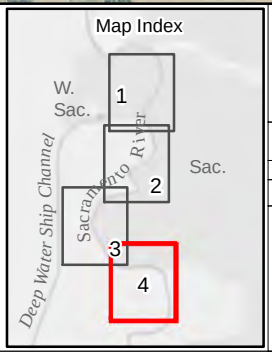
Checked
B. JONES, HDR

Drawn
C. PLOTTS, HDR

Counties
Vertical Datum feet NAVD88

Map Index



Water Surface Elevation Contour map 200-year Flood Event

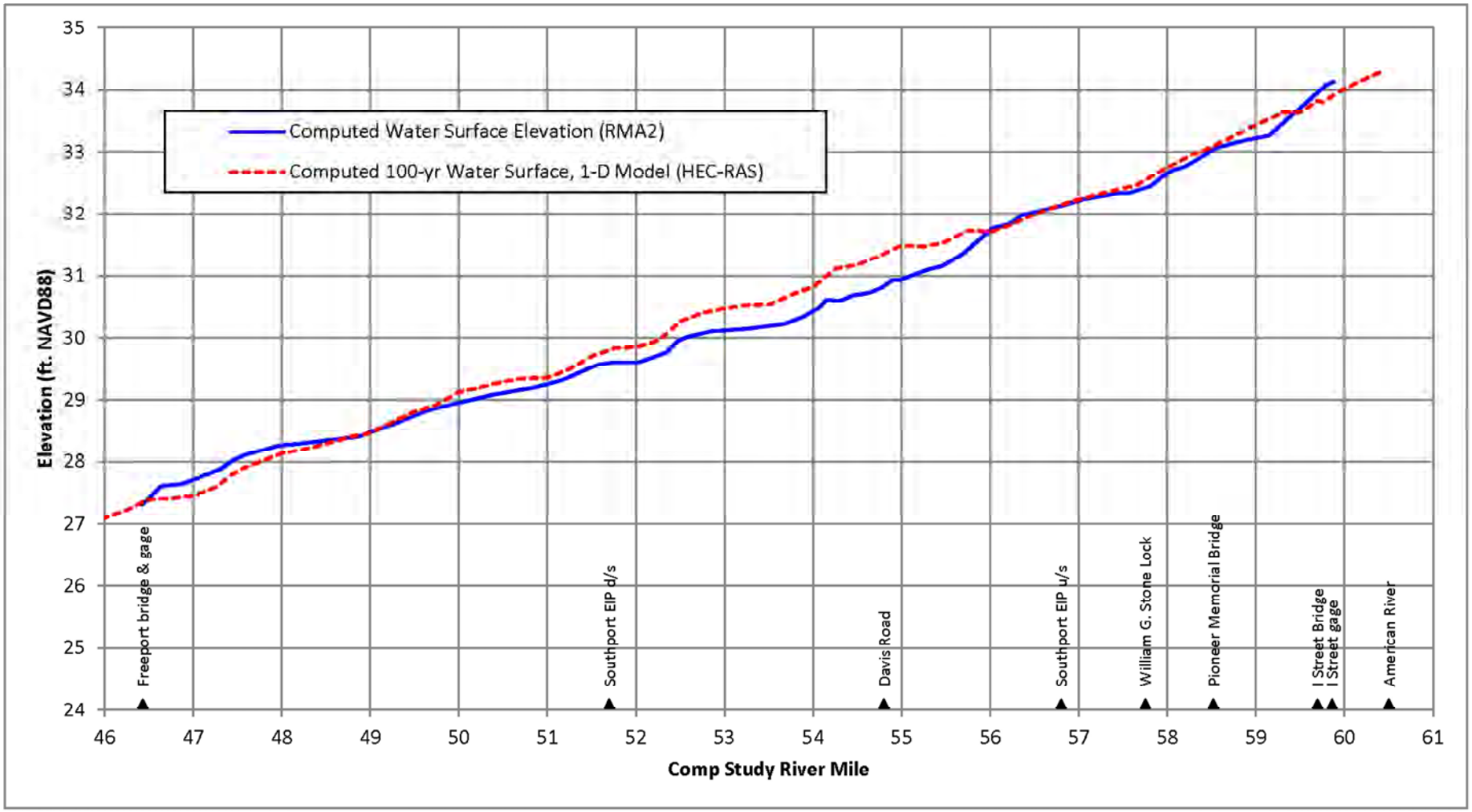
Exhibit H-12

Project Num: 453318-166505-028

Dec 2011

N
W E
S

0 1,000 2,000
Feet
1 inch = 2,000 feet



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WSAFCA
West Sacramento Area Flood Control Agency

Levee Improvement Program
Southport Early
Implementation Project

Project Manager
M. VECCHIO, HDR

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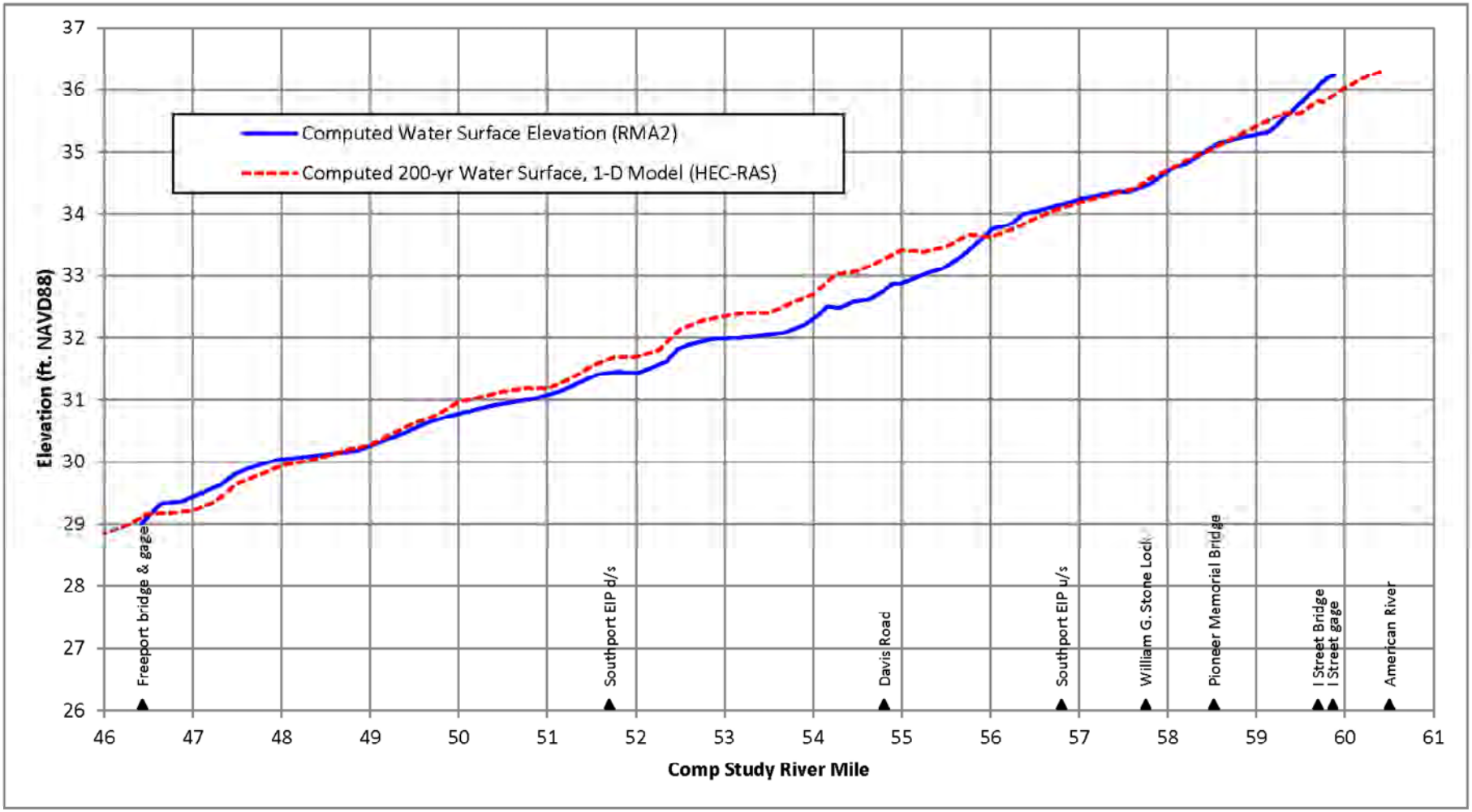
Drawn
C. PLOTTS, HDR

100-year Water Surface Elevation Profile

Exhibit H-13

Project Num: 453318-166505-028

Dec 2011



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WSAFCA
West Sacramento Area Flood Control Agency

Levee Improvement Program
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200-year Water Surface Elevation Profile

Exhibit H-14

Project Num: 453318-166505-028

Dec 2011

Appendix C.6

Memorandum—Average Annual Inundation Duration of the Offset's Lower Floodplain—cbec inc., eco engineering, September 6, 2013

MEMORANDUM

Date:	09/06/13
To:	Michael Vecchio (HDR), Sergio Jimenez (HDR), Carl Jensen (ICF)
From:	John Stofleth, M.S., P.E., Chris Bowles, Ph.D., P.E., Poyom Riles, M.S., P.E.
Project:	12-1001 Southport EIP
Subject:	Average annual inundation duration of the offset's lower floodplain (draft)

cbec has been requested by program and project management to estimate the average annual duration of inundation for the lower floodplain terrace (elevation 10 ft NAVD 88) within the proposed offset areas. The frequency and duration of inundation of this area has implications for the viability of new plantings during the establishment period as well as informing construction staging design.

This task was accomplished by first determining the approximate discharge that would inundate the offset's lower floodplain terrace (10 ft NAVD 88). To estimate this discharge that correlates to a water surface elevation of 10 ft NAVD88 at a midpoint between the offset areas, cbec linearly interpolated between computed (MIKE 21C) water surface profiles associated with Sacramento River discharges of 18,099 cfs and 33,501 cfs (cbec, 2012). This interpolation indicates that a Sacramento River discharge of approximately 29,000 cfs will correlate to water surface elevation of 10 ft NAVD 88 and would allow the offset area's lower floodplain terrace to inundate.

In order to determine the average number of days per year that a 29,000 cfs discharge was exceeded, cbec analyzed the historic flow record (1970 – 2010) from the USGS gauge at Freeport immediately downstream of the project reach. By analyzing the average daily flows from this dataset, cbec calculated that:

1. The 29,000 cfs discharge was exceeded 77 days per year on average between 1970 and 2010 (Table 1). As indicated in Table 1, this annual average varies considerably from year to year with the standard deviation of 65 days and a maximum of 239 days. The months with the highest average flow occurs between January and March each year (Table 2).

Assuming the offset had been constructed prior to this period of record the following statistics are interesting to note:

2. In 10 years out 40 years (or 25% of the years on record) the offset floodplain would have been inundated for at least 5 months consecutively between November and May.
3. In 40 years of record, the offset floodplain would have not been inundated in October.
4. In 40 years of record, the offset floodplain would have not been inundated in August, September and October.
5. The latest in to the calendar year the floodplain would have ever been inundated would have been July 1983 and 1995 (or 5% of the July's on record).
6. 50% of the January's on record the offset floodplain would have been inundated.
7. 55% of the February's on record the offset floodplain would have been inundated.
8. 53% of the March's on record the offset floodplain would have been inundated.
9. 30% of the April's on record the offset floodplain would have been inundated.
10. 28% of the May's on record the offset floodplain would have been inundated.
11. 28% of the December's on record the offset floodplain would have been inundated.

DRAFT

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Table 1. Number of days exceeding 29,000 cfs annually. Flow records derived from the USGS gauge at Freeport.

Year	Number of days flow exceeded 29,000 cfs
1970	115
1971	113
1972	28
1973	130
1974	151
1975	100
1976	0
1977	0
1978	113
1979	42
1980	85
1981	73
1982	199
1983	239
1984	110
1985	3
1986	75
1987	10
1988	13
1989	27
1990	3
1991	11
1992	21
1993	112
1994	3
1995	197
1996	146
1997	68
1998	209
1999	88
2000	73
2001	25
2002	35
2003	95
2004	78
2005	91
2006	161
2007	10
2008	19
2009	20
2010	56
Average	**77**
Standard Deviation	**65**
Minimum	**0**
Maximum	**239**

DRAFT

Table 2. Mean monthly discharge of the Sacramento River at Freeport. (Shaded green cells denote flows that would inundate the offset floodplain at 10 feet NAVD 88).

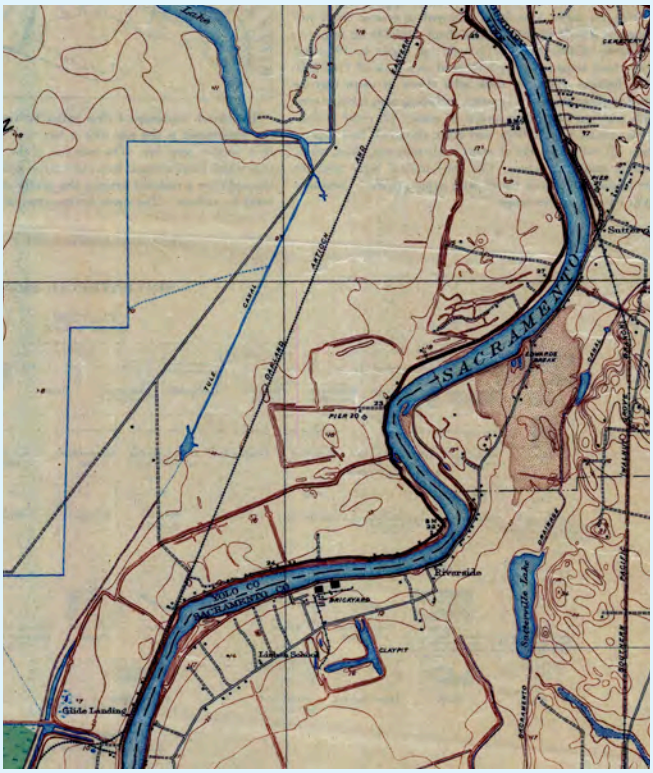
YEAR	Mean Monthly Discharge (ft^3/s) at Freeport # 11447650 (Calculation Period: 1970-01-01 to 2010-12-31)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1970	70,260	66,060	44,210	14,620	14,260	11,790	13,170	14,980	18,510	15,260	22,520	63,970
1971	52,320	31,200	30,480	38,270	29,190	27,550	20,980	22,460	24,390	16,070	15,850	21,760
1972	20,000	22,120	23,900	13,120	12,850	13,840	15,000	15,660	16,820	16,080	23,200	27,420
1973	60,130	65,260	51,640	20,670	16,420	14,940	15,170	16,120	17,490	16,720	48,040	61,630
1974	74,830	52,390	64,680	66,280	29,180	24,410	21,750	23,950	25,060	20,120	22,000	25,650
1975	19,430	47,520	50,940	33,170	30,260	23,710	18,280	19,500	20,380	19,170	22,250	25,550
1976	15,130	12,770	14,570	12,720	10,910	10,930	12,080	13,350	12,510	8,103	7,823	7,743
1977	9,802	8,003	6,573	5,961	7,597	6,865	8,248	7,687	6,838	4,494	6,687	11,750
1978	45,490	44,700	55,570	38,880	25,190	12,660	14,300	15,970	17,930	12,490	12,440	13,200
1979	23,190	32,440	29,160	16,550	17,980	12,210	16,410	15,680	14,570	12,580	15,200	20,320
1980	58,640	52,580	55,340	22,590	15,890	17,810	17,730	14,920	15,890	11,340	10,870	16,690
1981	18,510	24,240	24,510	17,220	13,780	10,730	15,300	14,850	12,800	9,895	32,940	62,060
1982	64,610	59,430	62,810	76,580	42,360	25,810	17,630	20,610	24,860	19,230	31,520	57,710
1983	47,510	79,040	78,290	60,510	62,280	48,380	31,000	25,040	24,620	21,150	48,820	74,510
1984	56,800	32,370	31,430	17,930	15,410	14,990	21,630	18,780	17,690	13,240	26,280	32,560
1985	16,790	18,270	14,310	12,500	13,430	13,310	16,040	13,450	12,190	9,711	10,420	16,110
1986	19,960	68,890	74,980	25,830	12,760	11,820	16,880	15,110	18,140	15,450	12,680	13,110
1987	13,170	17,400	21,580	11,830	9,996	10,070	15,140	14,440	11,630	9,509	8,129	15,740
1988	25,400	12,190	11,350	16,890	10,970	10,580	14,640	13,290	11,540	9,314	11,360	12,390
1989	12,830	12,060	43,370	21,270	13,800	13,290	18,770	18,320	16,460	14,270	14,830	15,400
1990	18,910	13,800	12,870	15,270	10,400	10,520	13,510	13,840	10,030	7,620	7,723	10,820
1991	8,984	8,133	25,750	10,880	7,332	8,930	9,514	9,515	9,948	9,398	6,958	9,259
1992	10,440	26,060	20,340	9,448	6,414	8,510	8,309	8,718	9,815	6,645	6,380	12,440
1993	48,260	48,600	49,340	43,210	24,950	30,470	19,860	21,080	15,830	13,820	12,090	20,340
1994	14,190	20,200	13,460	8,435	8,848	8,091	11,860	12,150	14,410	8,255	9,489	16,370
1995	62,210	58,180	71,920	61,440	63,180	38,960	29,230	18,720	23,270	14,150	12,610	24,570
1996	32,870	75,270	56,240	35,980	40,110	23,530	20,680	21,300	17,600	12,690	15,500	58,420
1997	87,110	57,330	24,470	13,490	11,410	15,220	20,840	18,720	14,000	12,010	14,790	22,010
1998	51,780	81,370	63,830	57,680	48,250	55,690	26,800	25,180	25,320	15,760	20,920	44,370
1999	34,500	67,150	56,840	30,680	19,740	17,240	22,240	18,030	15,830	12,380	13,840	16,550
2000	24,340	62,370	58,560	26,640	20,450	16,090	20,850	17,700	15,160	11,680	12,280	13,670
2001	17,190	20,870	24,700	12,310	9,060	12,380	14,940	13,220	12,360	8,370	12,300	27,380
2002	38,270	18,170	21,320	14,480	12,970	13,890	18,900	17,020	13,560	9,891	11,750	29,130
2003	51,940	36,090	22,920	21,590	40,540	22,280	22,430	19,580	15,350	11,000	12,450	27,790
2004	36,770	44,420	46,710	23,790	12,530	15,130	20,440	17,920	14,610	12,610	12,250	17,750
2005	33,680	24,870	30,370	22,130	40,220	28,650	19,670	17,250	17,930	14,070	13,390	35,460
2006	66,150	48,920	67,410	77,650	52,150	27,210	18,590	18,860	18,010	11,720	12,150	16,950
2007	13,820	22,700	18,320	13,630	9,363	12,290	19,060	17,120	15,200	10,540	10,010	12,120
2008	22,480	26,310	13,700	10,190	8,788	11,310	12,520	10,820	10,330	7,767	9,740	8,873
2009	9,143	20,470	22,620	13,600	16,370	11,950	18,620	15,090	11,450	9,781	9,008	10,610
2010	26,810	28,990	19,750	18,830	17,280	20,940	17,420	16,710	16,580	12,010	13,040	45,700
Average	35,000	38,300	37,300	26,500	21,600	18,200	17,700	16,700	16,000	12,400	15,900	26,200

Appendix C.7

West Sacramento / Southport EIP: Task Order 2: Historic and Current Preliminary Geomorphic Assessment— cbec inc., eco engineering, September 12, 2011

cbec
eco engineering

Hydrology | Hydraulics | Geomorphology | Design | Field Services



West Sacramento / Southport EIP: Task Order 2: Historic and Current Preliminary Geomorphic Assessment

WSAFCA
West Sacramento Area Flood Control Agency

West Sacramento Flood Control Agency and HDR Engineering

Final Report
September 12, 2011
Project Number 11-1003

Historic and Current Preliminary Geomorphic Assessment
Southport EIP
Task Order 2

Prepared for
West Sacramento Flood Control Agency
And
HDR Engineering

Final Report
Prepared by
cbec, inc.

{ŜLJŭŜYōŜℕ 2011

cbec Project #: 11-1003

This report is intended solely for the use and benefit of the West Sacramento Flood Control Agency and HDR Engineering. No other person or entity shall be entitled to rely on the details contained herein without the express written consent of cbec, inc., eco engineering, 1255 Starboard Drive, Suite B, West Sacramento, CA 95691.

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1 INTRODUCTION

1.1 BACKGROUND

The West Sacramento Area Flood Control Agency (WSAFCA) is in the final phase for Southport Early Implementation Project (EIP). The EIP will identify improvements, or combinations of improvements, to be used to attain the level of flood protection desired for West Sacramento Flood Control Agency (WSAFCA). Four combined measure alternatives (CMAs) are currently under development by HDR Engineering (HDR), one of which will be forwarded as the preferred alternative. The CMAs include options for setting back levees from their current alignment parallel to the right bank (west side) of the Sacramento River, to strengthen the existing levee in-place, and to construct a new levee parallel to the existing alignment. Implementation of setback levees has the potential to change the existing hydraulics, and hence geomorphology, of the Sacramento River and floodplain, both through the project reach and regionally. Implementation of any of the CMAs will result in impacts to regulated land cover types and suitable habitat for special-status species.

1.2 STUDY OBJECTIVES

The purpose of this technical memorandum (TM) is to document the findings of various studies undertaken by cbec, inc., eco engineering (cbec) in support of the final phase of the EIP:

1. To investigate historic planform changes and geomorphic influences on the river over recent history.
2. To describe the current geomorphology of the Sacramento River through the project reach.
3. To investigate the potential geomorphic impacts to the Sacramento River, both region-wide, and locally, at a preliminary level, as a result of potential implementation of various CMAs.
4. To provide recommendations for additional geomorphic studies to be undertaken in support of regulatory processes and design of the project.

2 HISTORIC PLANFORM CHANGES AND GEOMORPHOLOGY

This section provides an historic perspective on how the land use changes, and evolution of the Sacramento River has affected the floodplain and geomorphic processes within the river channel. The perspectives described here are based on earlier studies (Kleinfelder, 2007; William Lettis Associates (WLA), 2009) and research based on historic maps dating back to the earliest available maps in 1850.

The present-day Sacramento River system has been shaped by thousands of years of complex river processes. These processes include channel migration, erosion and flood-stage deposition. During most of Holocene time (since the last ice age, generally defined as the last 11,000 years), sediments from the Sierra Nevada and Klamath Mountains were carried by the Sacramento River and deposited into the Great Valley. Natural levees were built up along the river banks that frequently overflowed during flood stages, depositing sediments into low-lying basins and wide floodplains. The natural river migrated through a wide active area comprised of ponds, abandoned channels, meander cutoffs, oxbow lakes and dendritic channels.

Hydraulic mining in the Sierra foothills during the late 1800's resulted in high volumes of sediment discharged to the Sacramento and American Rivers. During this time, attempts were made to control flooding and reclaim low basin lands for agriculture by levee construction. Most of the early attempts at flood control were unsuccessful and resulted in multiple breaks within the levee system.

Mapping by Helly & Harwood (1985) shows a variety of alluvial deposits placed by the river within meandering channels. Within the project limits, some of these channels have been eroded/incised, backfilled and overlain by younger deposits. A review of historic air photos from 1932-2007 by Kleinfelder (2007) identified numerous drainage features and depressions that may be remnants of abandoned river channels and other drainage features.

Areas of historic levee breaks along old natural levee are identified by WLA (2009) as "crevasse splays", characterized by coarse sediments deposited in a fan-shaped or dendritic pattern away from the river. WLA also mapped substantial areas of "overbank deposits" consisting of sand, silt and clay under and adjacent to the existing levees along much of the project alignment. These soils were deposited during high-water events as water overtopped the old natural levee. Relatively deep (greater than 100 feet at some locations) deposits of sand and gravel are located under and land-side of the existing levee along most of the project alignment. These deposits are identified as "meander scrolls" in the WLA mapping and are remnants of riverbanks and natural levees created as the Sacramento River migrated southeast.

The WLA geomorphology mapping of the West Sacramento Area is presented by Figure 3-1.

Historic maps and aerial images of the project area were also collected and studied. Maps from 1850, 1880, 1895, 1908, and 1916 were obtained from various sources as referenced in Figure 2-1 to Figure 2-5. Aerial images from 1937, 1964, and 1984 were obtained from various sources as referenced in Figure 2-6 to Figure 2-8. The map from 1850, and the aerial images from 1934 were compared with the current river alignment to understand bank line migration through the past 160 years, as shown by

Figure 2-9. Historic research on levee development and failure was also undertaken to gain a full understanding of the geomorphic changes that have occurred in the project region. Historic channel and floodplain geomorphology interpretation prior to the establishment of records, based on geologic investigations, is covered in greater detail in Section 3.1.

The following sections describe the results of this analysis.

2.1 HISTORIC INFLUENCES

- The 1850 Ranchero maps (also known as land grant maps or land case maps) were originally developed as part of the private land claims adjudicated by the U.S. District Courts of California (Northern and Southern Districts) and the U.S Circuit Court (9th Circuit) from ca. 1850 to 1860. Since their intent was to map private land and ownership, not geomorphic features or landmarks, these maps provide anecdotal evidence only. They do, however, approximately portray the land use and habitat prior to any major anthropogenic influences. The area that the City of West Sacramento currently occupies was essentially a tidal backwater area, at the fringe of the Sacramento and San Joaquin River Delta (Delta) consisting of predominantly tule marsh in the 1850, as shown by Figure 2-1. This figure seems to indicate that the alignment of the Sacramento River changed dramatically between 1850 and 1880. However, it is unclear the level of accuracy to which the 1850 maps were produced and therefore it is not possible to assume that the river was actually realigned during this period. From 1864 to 1868, the Lower American River was rechannelized, in an effort to create higher velocity flows that might scour out mining debris, Sacramento officials straightened the last two miles of the Lower American River above the confluence with the Sacramento River. When the project was completed in 1868, the Lower American River joined the Sacramento River about a mile upstream of its original location.
- The 1880 map shows the river approximately in a similar alignment to today, as shown by Figure 2-2. The project area was divided into 32 properties and bought by different landowners. Some of the larger landowners are C.H. Crum (acreage unknown), D. McGoeman (220 acres), T.A. Snider (325 acres), and H. Hyster (217 acres). No levees had been built at this time, according to this map. The first comprehensive flood control plan in this area was in response to the 1878 flood. State Engineer William Hammond Hall developed an integrated, comprehensive flood control plan for the Sacramento Valley. The plan subsequently came to include a system of levees, weirs and bypass channels to protect existing population centers. This plan was authorized and federally funded by congress in 1917. This map also shows the development of the Tule Canal, which runs from Lake Washington, north of the project reach, to Big Lake, south of the project reach.
- The 1895 map, shown by Figure 2-3, shows levee installations on both banks of the Sacramento River for the project reach. This is the first instance of levee construction. This map also shows high and low water marks, presumably in the Mean Sea Level datum (2.53 feet below NAVD 88). It is interesting to note the high water marks are between 28.3 and 26.0 feet NAVD 88.
- The 1908 map, shown by Figure 2-4, provides early details of the project area. It shows the project reach with measured cross sections, marshlands, regional lakes, sand bars, levees, land ownership, buildings, channel meander areas, water surface elevations, topographic lines, land

uses, and historic flood plains. The planform of the river had not significantly changed from the 1895 map, but this is the first map were depositional and erosional patters can be seen. Levees are shown on this map and were built on a parcel-by-parcel basis to protect land from flooding by the Sacramento River.

- The 1916 map, shown by Figure 2-5, is the earliest US Geological Survey (USGS) map of the area. It shows one lake on the west side of the Sacramento River near Glide Landing, in the southern most section of the project area. It is interesting to note that Bees Lake is not shown on this map, nor older maps.
- Aerial images from 1937, shown by Figure 2-6, indicate land use on the floodplain and depositional areas in the channel at the time. These aerials show the first indication that the land through the project reach was primarily used for row crops, and irrigation from the river was prominent. Extensive sand bars appear to be present at this time, likely natural channel features exacerbated by legacy sediment deposits as a result of the hydraulic mining era of the late 1800s. This 1937 photograph pre-dates flow gauging on the Sacramento River, however it appears with comparison to later photographs, that the presence of channel sand bars diminishes over time.
- Aerial images from 1964 (flow of 11,900 cfs) and 1984 (flow of 38,900 cfs), shown by Figure 2-7 and Figure 2-8, respectively, show the gradually increasing urbanization in the area, particularly the east side (City of Sacramento) of the Sacramento River. The project reach was still essentially pastureland and row crop agriculture, with progressively increasing signs of urbanization.

2.2 HISTORIC SEDIMENT REGIME, EROSION AND MIGRATION

Since levees of some form have been in place since at least 1895, augmented by rip-rap protection in recent history, there has been very little river migration since that period. As mentioned previously, differences in the perceived river alignment between the 1850 and 1880 maps are clear, but the accuracy of the 1850 maps should be taken with caution. Within the main channel of the Sacramento River however, which has been constrained by levees, agriculture, and urbanization since the early 1900s, the alignment of the river has not changed substantially in over 100 years, as shown by Figure 2-9. However, erosion and deposition patterns have changed over the last 100 years, which are shown by Figure 2-2 to Figure 2-8 and summarized by Figure 2-9. Typically, erosion occurs on the outer banks of meanders or bends where the velocity of the flow is the highest. These areas have been the most problematic for levee maintaining authorities over the last 100 years. Depositional gravel or sand bar features typically form on the inner banks for meanders where the velocity of flow is the lowest, and these deposits can be seen in the earlier maps dating back to 1908. Observations made through this assessment appear to match comparable observations made in a recent unpublished US Army Corps of Engineers study of the region (Northwest Hydraulic Consultants, personal communication).

The morphology of the Sacramento River through the project reach has been largely affected by the sediment regime and budget of the watershed over the last approximately 130 years. As a result of hydraulic gold mining in the late 1800s, vast amounts of sediment were transported from Foothill rivers and streams into tributaries and hence into the Sacramento River. Lower energy reaches of the

Sacramento River, such as through the project reach, would have had vast amounts of these sediments deposited on the bed of the river. With the cessation of hydraulic mining in the early 1900s, and the construction of dams (sediment, flood and water supply) through the middle of the 20th century, the supply of sediment to the system was dramatically reduced. As a result a period of rapid erosion occurred causing incision of the bed and widening of the banks of the Sacramento River. Construction of levees through the mid- to late- 20th century, reduced the amount of river widening, but exacerbated the rate of bed incision. While bed incision has likely reduced in the last 20 to 30 years, bank erosion is an ongoing issue and is a major contributor to finer sediments transported through the Sacramento River. In addition, agricultural runoff erosion also contributes to fine sediment supply.

Closer analysis of the historic sediment regime through the project reach, including morphologic changes, was undertaken through a historical analysis of channel slope through the reach. Figure 2-10 shows a longitudinal comparison of the channel bed between 1908 and the current day. The longitudinal profile from 1908 was digitized from the 1908 map. The longitudinal profile from 2011 was surveyed in the spring of 2011 by cbec as described in Appendix B. Slopes of 0.008% and 0.006% corresponding to 1908 and 2011, respectively, were calculated, based on the slope of the water surface profile. The water surface profile was used since the bed elevations obtained were too variable to allow a reasonable comparison. These values are consistent with the modeled results from MBK's 1D model and show no significant change in slope between 1908 and 2011. This to be expected since the planform of the reach has not substantially changed over this time and any degradation/aggradation has occurred uniformly across the reach.

Finally, the hydrologic changes in the Sacramento River watershed have also had an impact on the morphology of the river through the project reach. The regional hydrology has substantially changed since dramatic flow regulation occurred on the Sacramento River, with construction of Shasta Dam completed in 1945, and other large tributary dams such as Oroville Dam on the Feather River, completed in 1968, and Folsom Dam on the American River, completed in 1955. In combination with urbanization in the Sacramento Region and the resulting hydromodification, and the changes in the sediment regime described previously, have resulted in the morphologic conditions observed today. Further discussion of these morphologic changes is provided in Section 3.4.

2.3 HISTORIC FLOODPLAIN GEOMORPHIC CHANGES

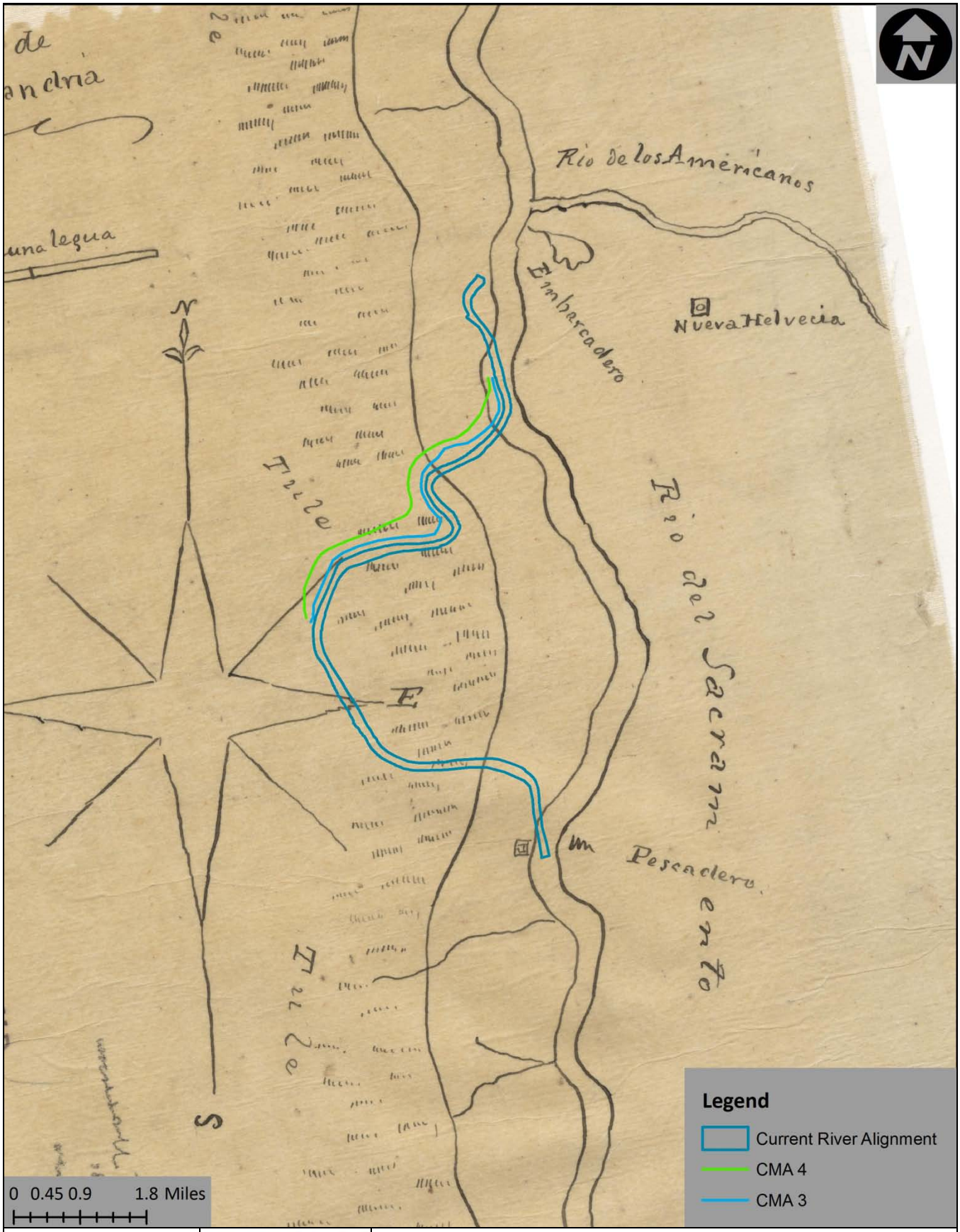
The natural levees of the Sacramento River were estimated to be between 5 and 20ft high prior to constructed levees being built (Tompson, 1960). During bankfull flows, water often overtopped these natural levees and entered the floodplain. During extended periods of high floods, the floodplains acted as a persistent marsh. Some of the early aboriginal people, the Wintun, considered this region "the half-drowned region" and did not inhabit these floodplain areas. Approximately 40,000 acres of tules remained in Yolo County in the 1870's during colonization from Spaniards. Due to the frequent inundation of this area, the land was almost exclusively used for livestock. 1878 sparked the creation of the Sacramento River Drainage District, which undertook the task diverting floodwaters into canals and expanding the main channel in order to scour out the debris from hydraulic mining. The main drainage canal in the vicinity of the project reach is the Tule canal seen in Figure 2-2. The District assumed that

the poorly drained tule basin would be sacrificed to spring floods in order to save the more valuable land near the river.

In 1907 uncontrolled flows of 525,000 cfs passed through the Yolo basin, creating a commerce barrier between the Sacramento area and San Francisco. Flood events like this helped the regional districts gain funding for studies and help construct levees. Figure 2-4 illustrates levees constructed as the product of this funding.

Lake Washington has undergone few changes since it is first seen on the 1880 map (Figure 2-2). From 1880 to 1937, as shown by Figure 2-2 through Figure 2-6, there are very few changes to the planform shape of the river. As population grew, the lake has been altered to accommodate the changing needs. In 1963 it became directly connected to the Sacramento River by means of the Sacramento Deep Water Ship Canal, which can be seen in Figure 2-7.

Bees Lake is not observed until 1937, as shown by Figure 2-6. Very few changes can be seen in the planform view between its first occurrence and today. Since Bees Lake is only first observed in 1937 it is unlikely to be a relic feature of the floodplain. It may have been exacerbated by anthropogenic disturbance, such as construction of levees, and associated loss of free surface water, or shallow groundwater drainage to the Sacramento River.



Notes: Notes: Map Courtesy of Shields Library at the University of California Davis.	cbec eco engineering	*Historic and Current Preliminary Geomorphic Assessment- Southport EIP* **1850 Map**		
		Project No. 11-1003	Created By: LA	**Figure 2-1**

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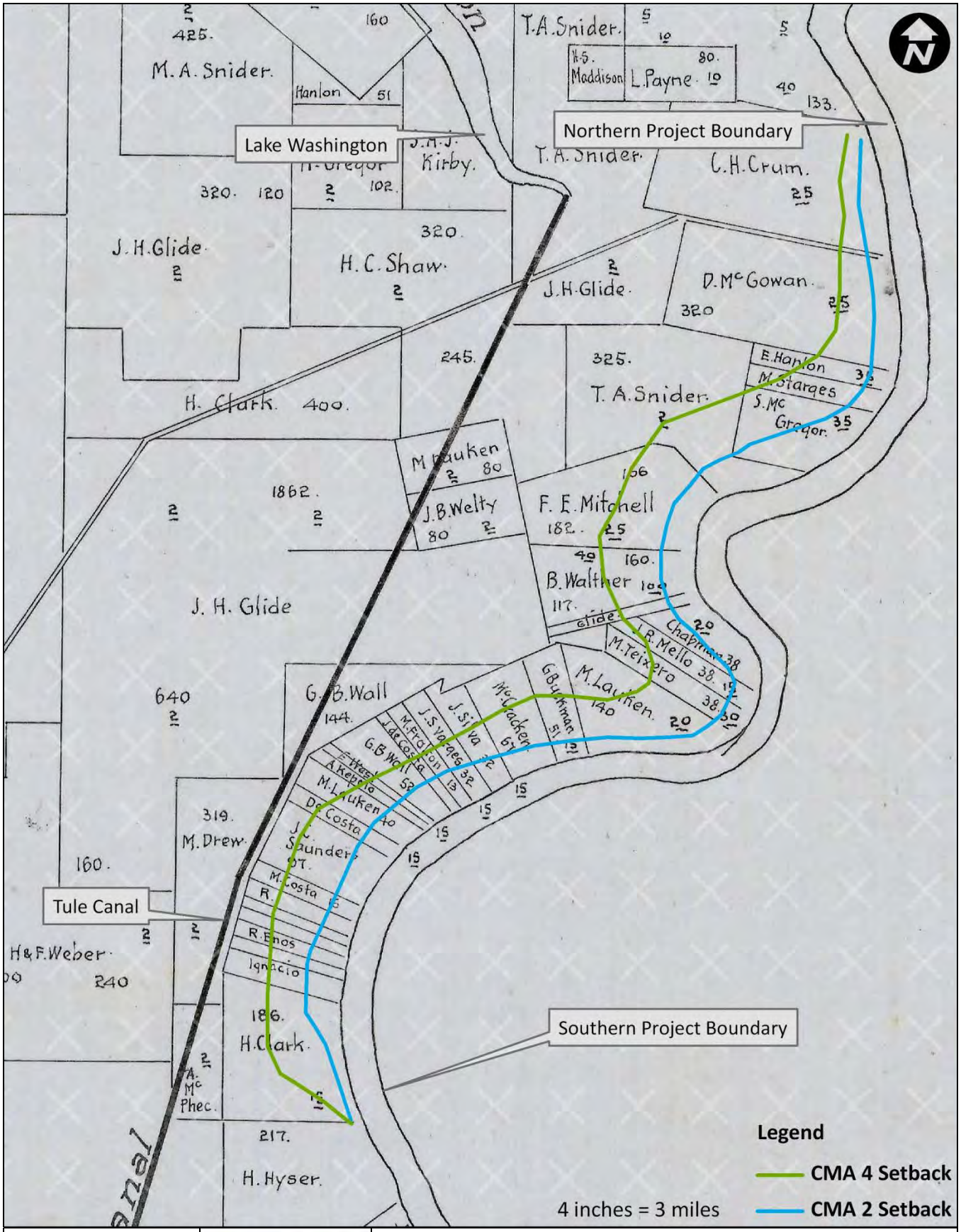

Notes: Map courtesy of Shields Library at the University of California, Davis,	cbec eco engineering	*Historic and Current Preliminary Geomorphic Assessment Southport EIP* **1880 Map**		
		Project No. 11-1003	Created By: LA	**Figure 2-2**

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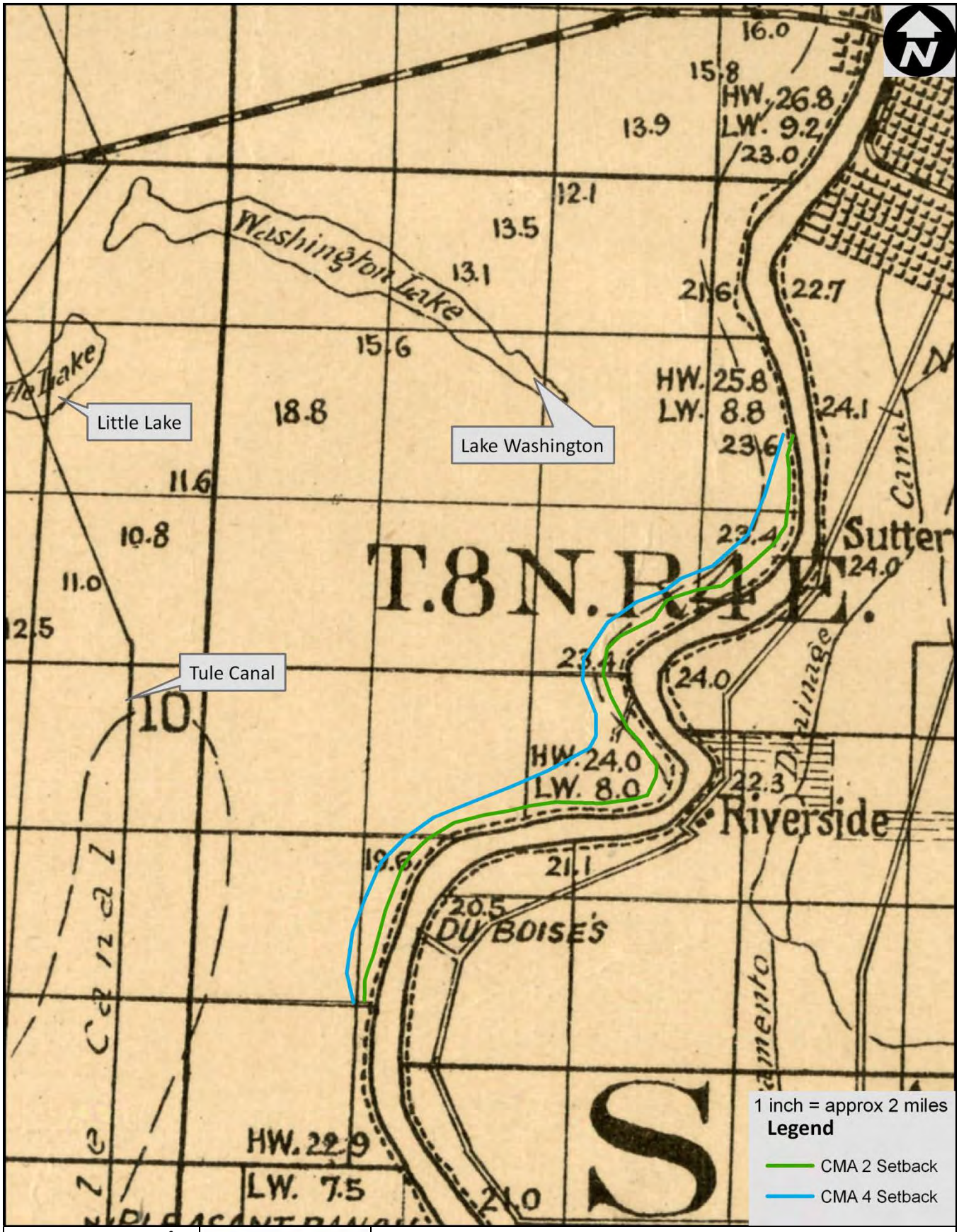

Notes: Map courtesy of Shields Library at the University of California, Davis,	cbec eco engineering	*Historic and Current Preliminary Geomorphic Assessment Southport EIP* **1895 Map**		
		Project No. 11-1003	Created By: LA	**Figure 2-3**

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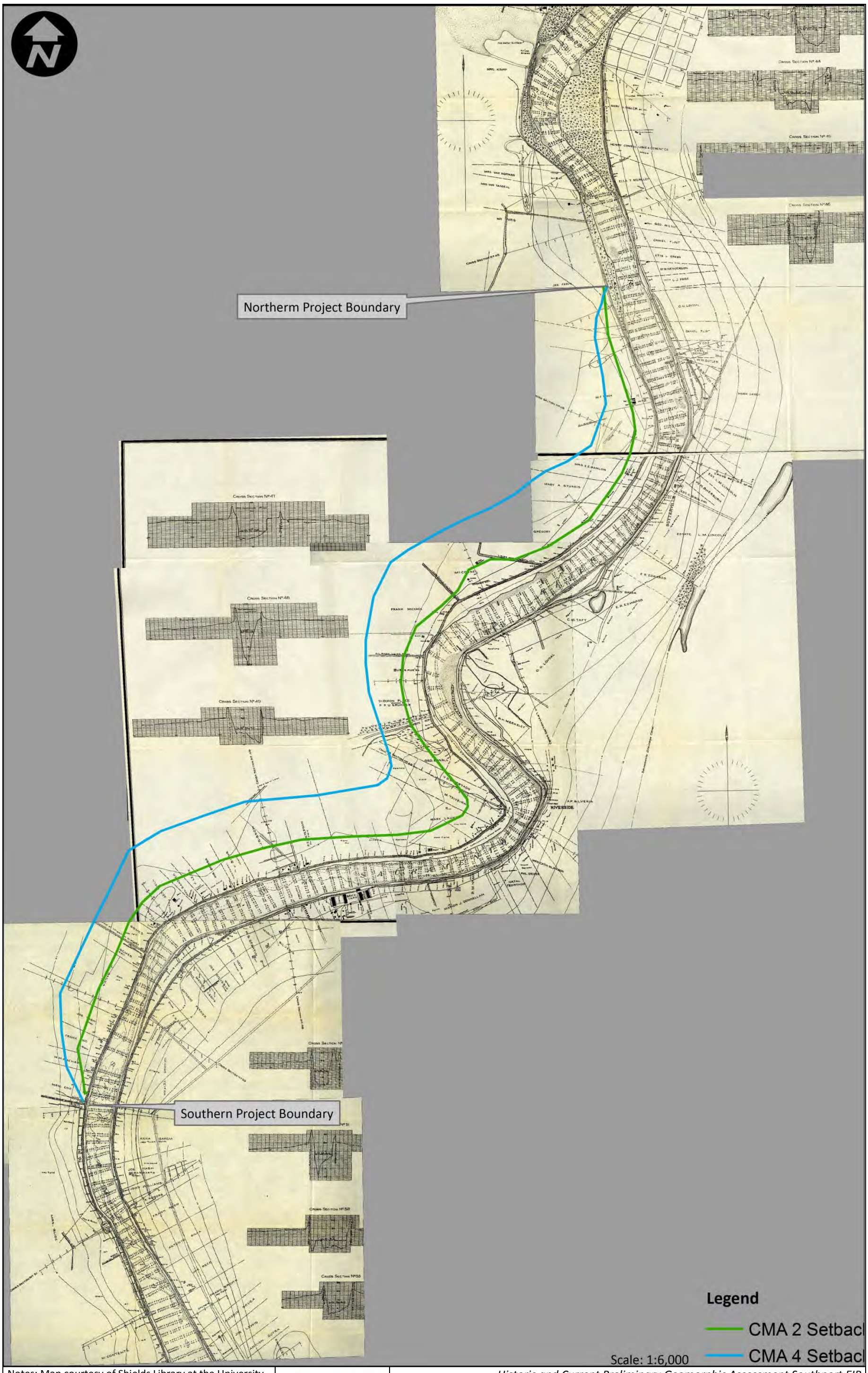

Notes: Map courtesy of Shields Library at the University of California, Davis. CMAs for reference only.

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1908 Map

Project No. 11-1003	Created By: LA	**Figure 2-4**

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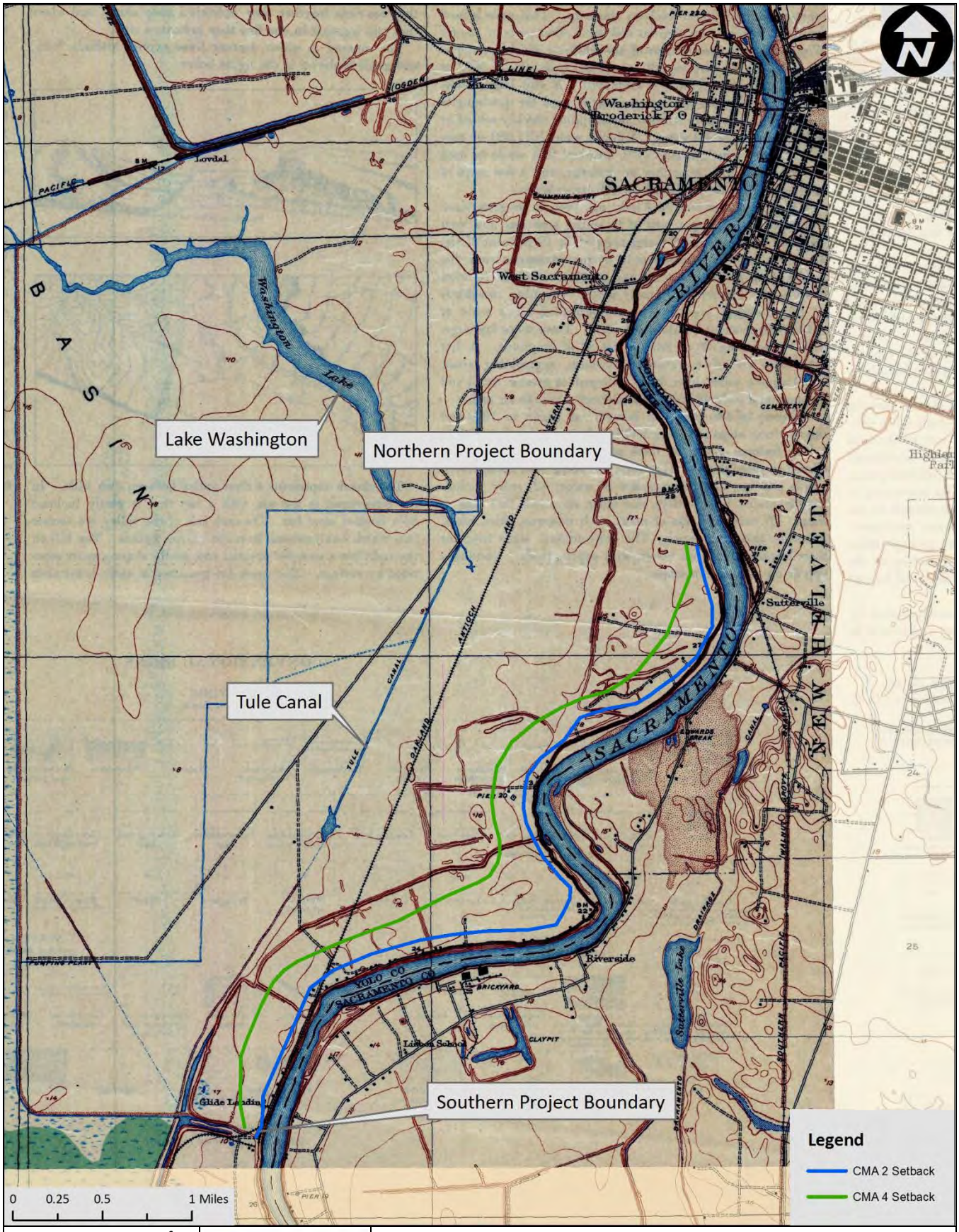

Notes: Map courtesy of USGS.	cbec eco engineering	*Historic and Current Preliminary Geomorphic Assessment Southport EIP* **1916 Map**		
		Project No. 11-1003	Created By: LA	**Figure 2-5**

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Notes: Aerial image courtesy of the University of California, Davis.

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1937 Aerial Image

Project No. 11-1003	Created By: LA	**Figure 2-6**

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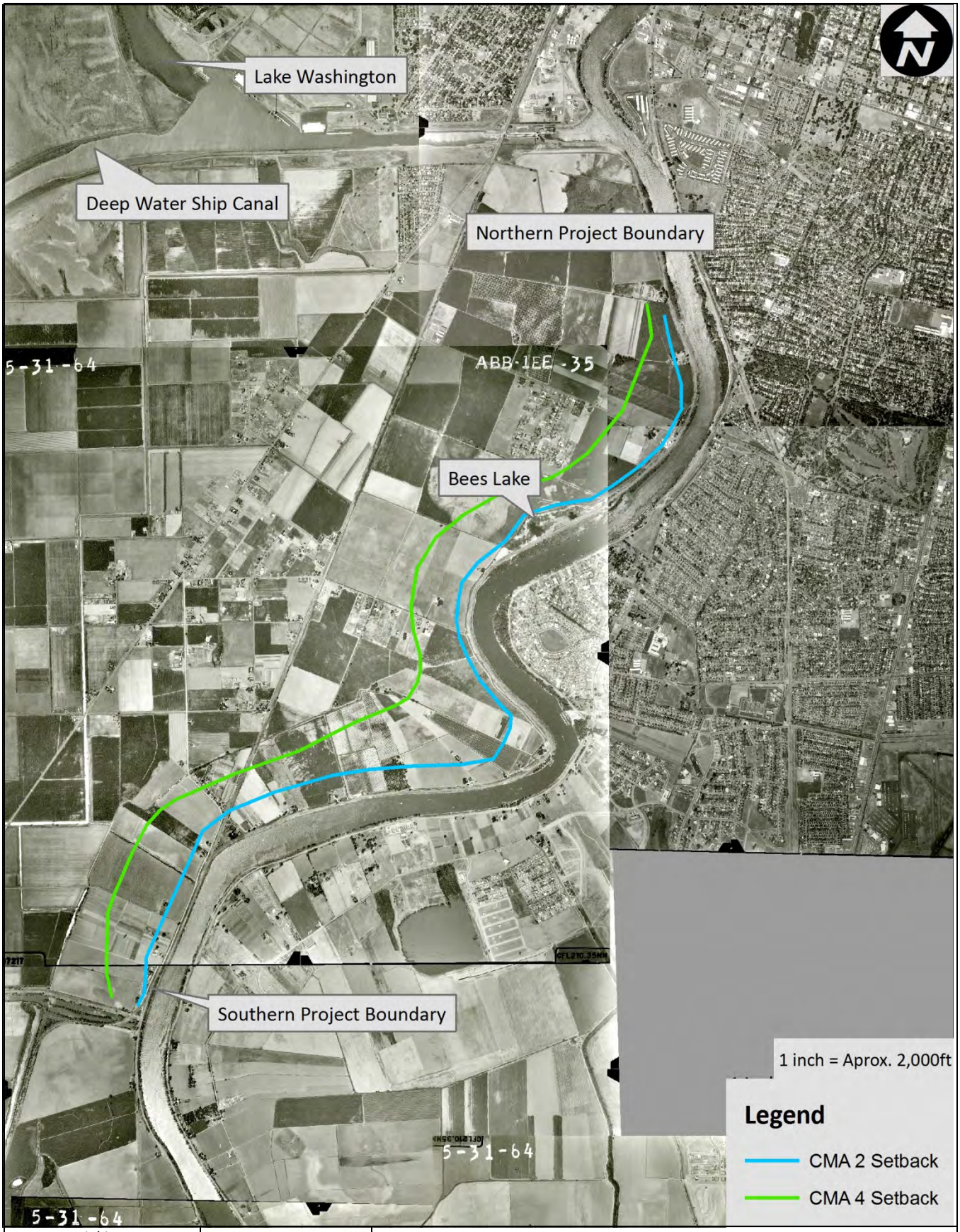

Notes: Aerial image courtesy of the University of California, Davis.

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1964 Aerial Image

Project No. 11-1003	Created By: LA	**Figure 2-7**

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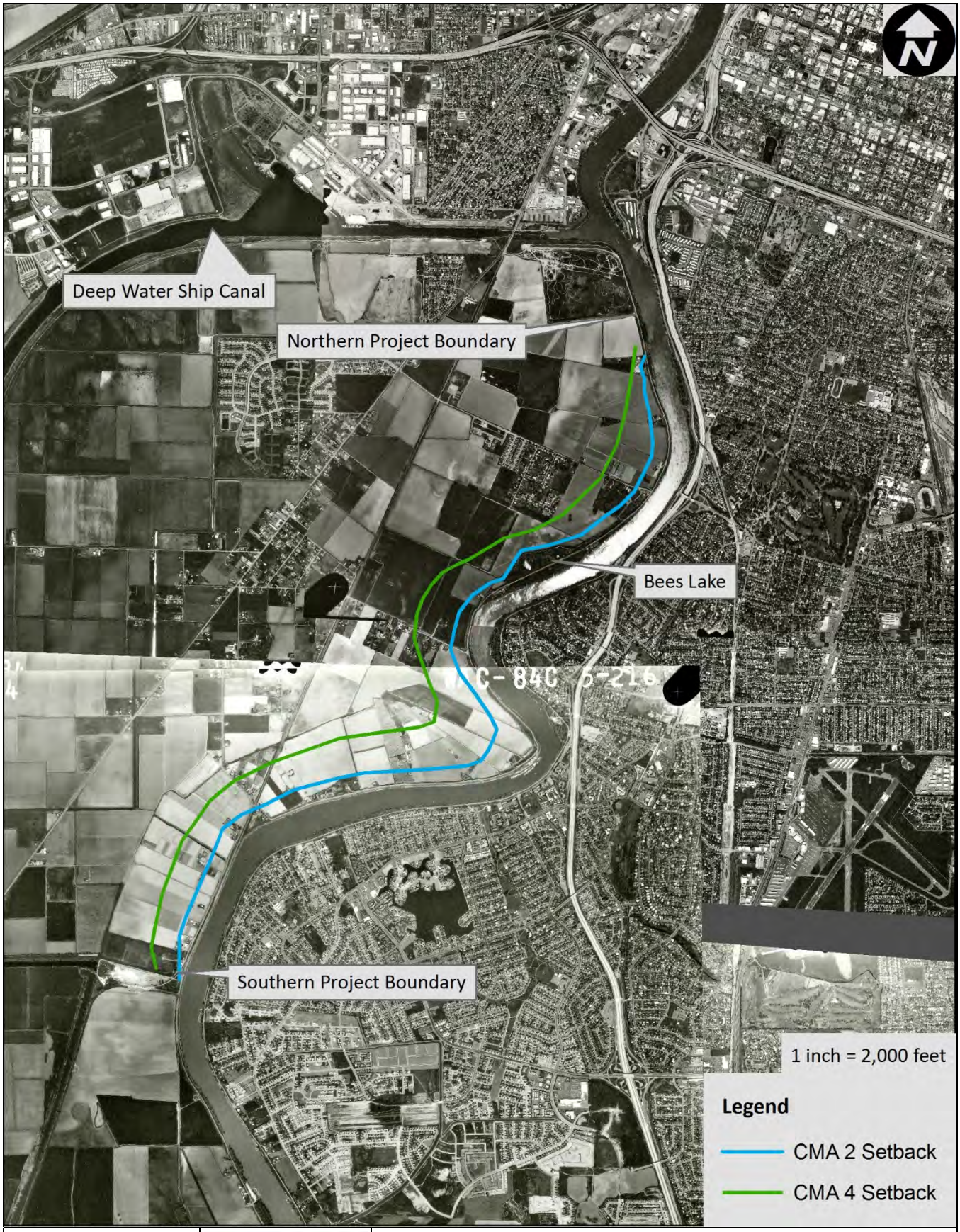

Notes: Aerial image courtesy of the University of California, Davis.

Historic and Current Preliminary Geomorphic Assessment Southport EIP

1984 Aerial Image

Project No. 11-1003	Created By: LA	**Figure 2-8**

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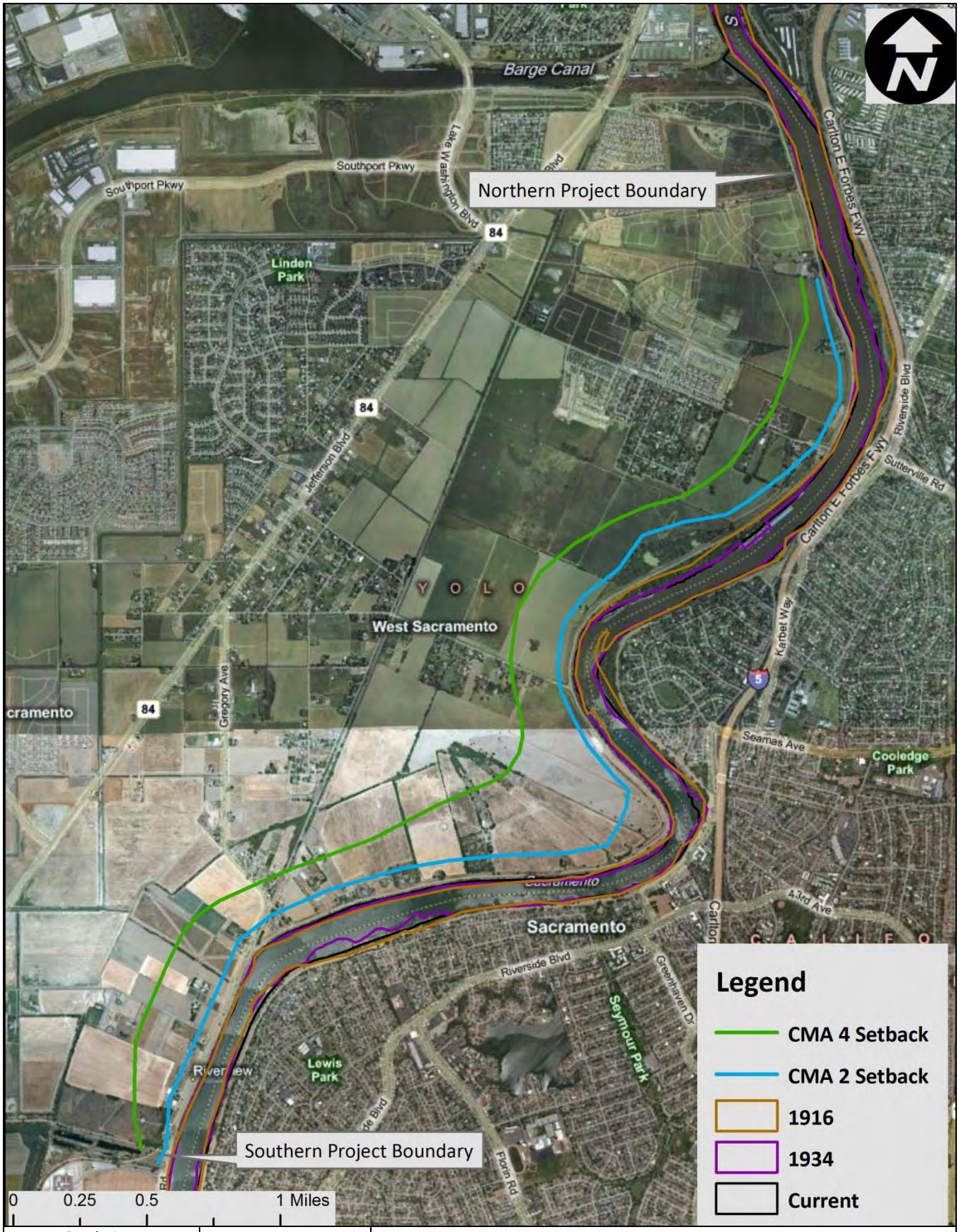

Notes: Orthoimagery courtesy of Bing Maps.

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Historic Changes in Bank Lines

Project No. 11-1003	Created By: LA	**Figure 2-9**

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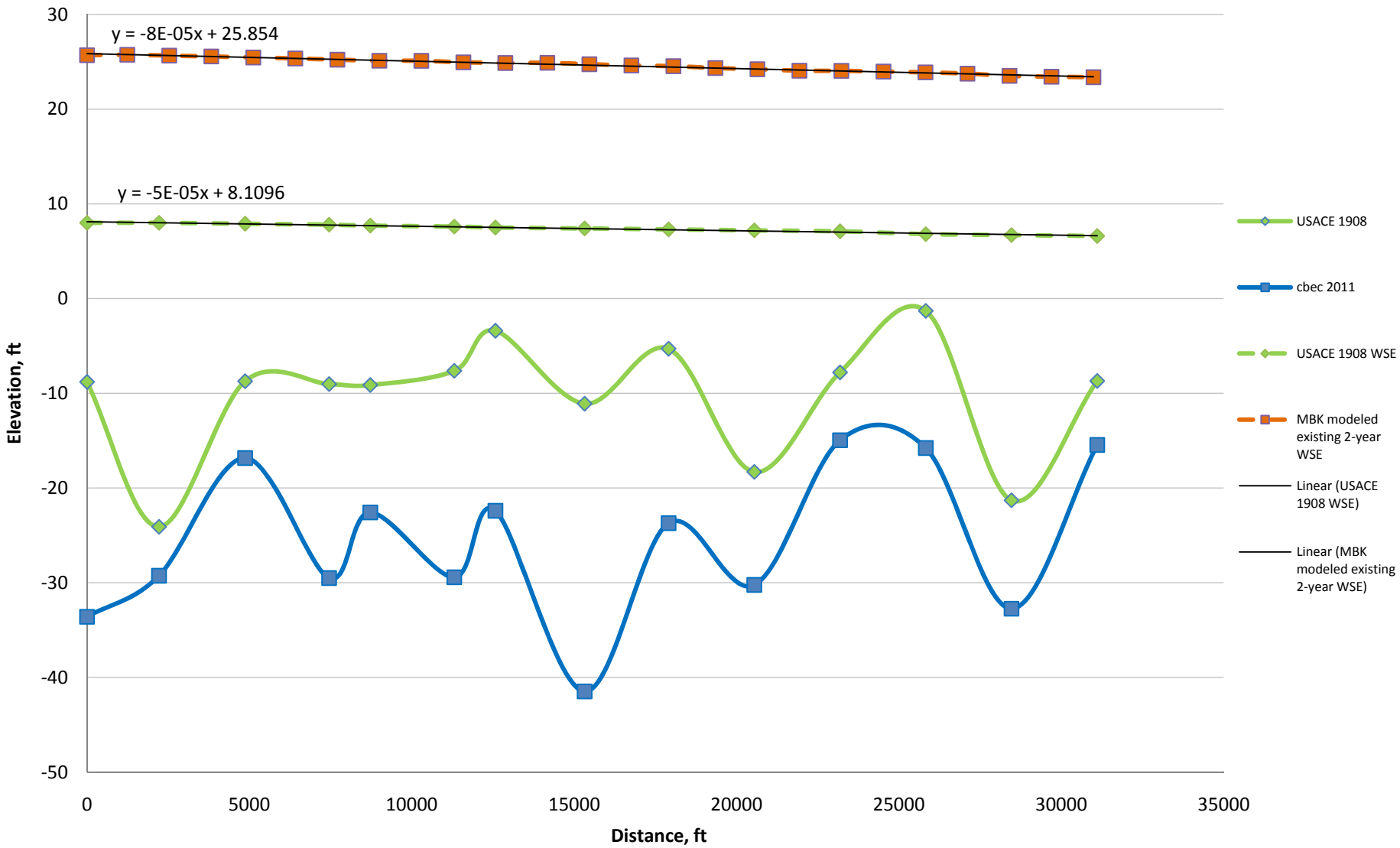

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Longitudinal Profile

Project No. 11-1003	Created By: LA	**Figure 2-10**

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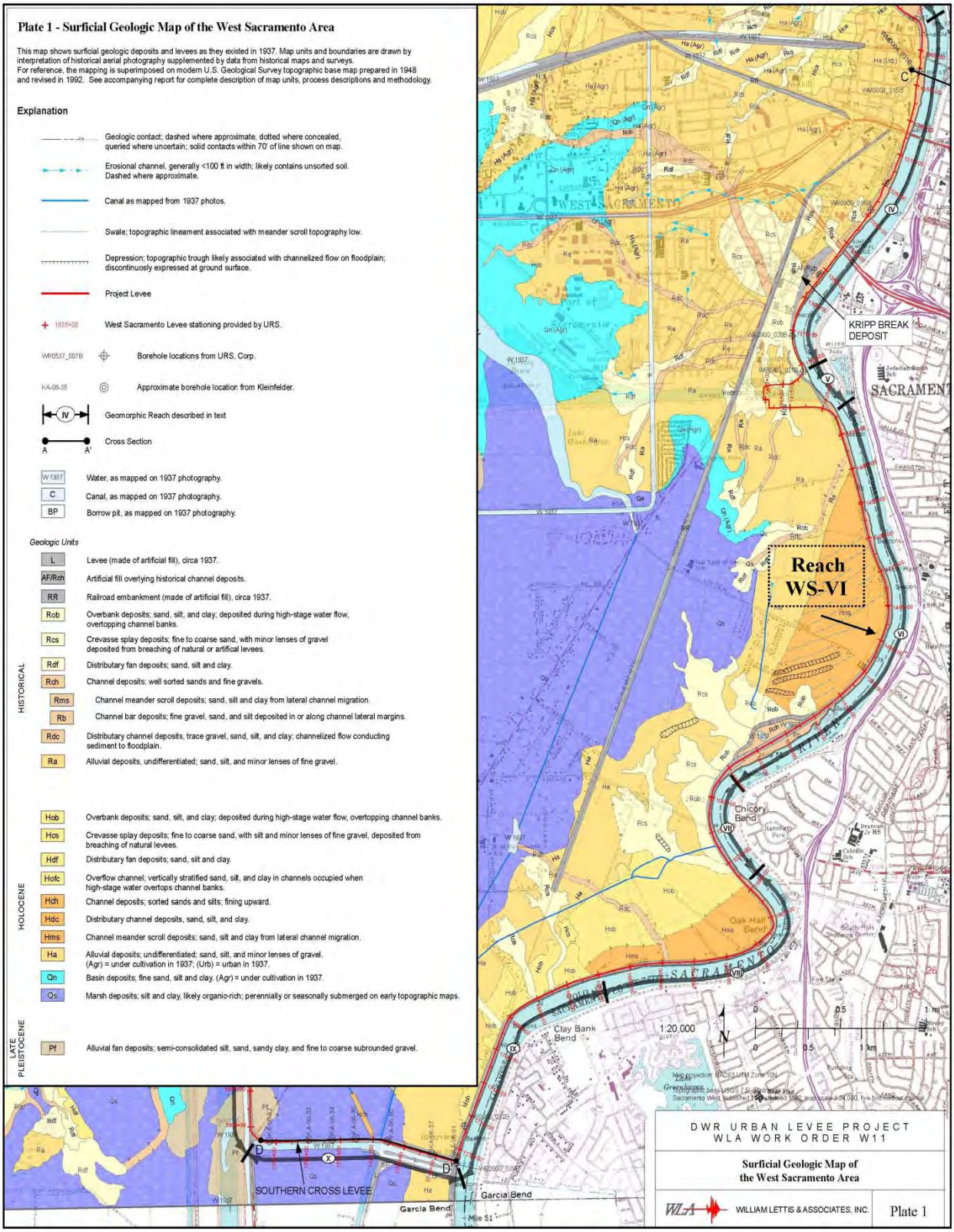
3 CURRENT GEOMORPHOLOGY

This section describes the current geomorphology of the Sacramento River through the project reach, and the characteristics of the floodplain.

3.1 GEOLOGY AND SOILS

The northern segments of the project reach have been largely covered with artificial fill associated with urban development in the City of West Sacramento. The 1916 USGS topographic map, as shown by Figure 2-5, as well as geologic research, suggest extensive fluvial deposits were present in this segment, that were covered by development by 1937 (Figure 2-6). Holocene Alluvium beneath the levee consists of loose, brown, silty fine sand and sandy clay. Beneath this formation is about 50 feet of poorly-graded compact brown fine to coarse sand, with some occasional gravel and silt. Sand found about 20 feet beneath the base of the levee may be representative of the last Pleistocene upper Modesto Formation deposits. The sand layer is uniform from east to west on both sides of the levee. This lies on top of about 20 feet of gravel with silt and sand, which lies on hard clay and silt.

The river has displayed historical overbank flooding and deposition along with levee performance issues as well across from Miller Park, where on the outside of a river bend, it is not rare to see deposition and flooding. In March 1907, a flood event caused a break in the levee on Kripp farm, which deposited many acres of sand, about 4 to 5 feet thick. Further South, in reach WS-VI (as shown by Figure 3-1,WLA Geologic map) most deposits are made up of Holocene meander scroll, historical channel, and historical alluvial deposits. Meander scrolls are a series of ridges and troughs that are formed from the stacking of point bar deposits along the inner bank of a stream meander as the channel migrates laterally and down-valley towards the outer bank (Saucier, 1994). They are recognized as being prone to levee under seepage, being unconsolidated and very loose, horizontally stratified with vertically interbedded sand, silt and clay. Through the reach encompassing Chicory Bend, the sediment beneath the levee consists of overbank deposits that are made up of beds of silt, clay, sandy silt, and sand. Below this section is a 30-foot thick composite of granular fluvial sediment deposits, and underneath that is hard clay. Further south, towards the Pocket Area and Garcia Bend, there are additional Holocene meander scroll deposits. This reach consists of loose silty sand, and sandy or clay-like silt directly beneath the levee. The reach near Garcia Bend has similar features to the reach near Chicory bend, but the meander bend is not as sharp. The deposits beneath the levee are fine-grained, soft silt, sandy silty clay, and clay for about 20 to 40 feet in depth beneath the levee. The proportion of sand is likely greatest in the upper 10 to 15 feet beneath the levee and likely evidence of the latest Holocene overbank sedimentation and natural levee construction. At greater depths the sediment is made up of coarser-grained sands that overlie gravel. In summary, there is a general upward trend of sediment becoming finer in the subsurface stratification, going from gravel to sand to silt to clay throughout about 100 vertical feet beneath the levee.



Notes: Map courtesy of WLK Consulting.

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Surficial Geologic Map

Project No. 11-1003	Created By: LA	**Figure 3-1**

3.2 FLOODPLAIN HYDRAULIC CONNECTIVITY

An initial estimate of the connectivity of the Sacramento River to its floodplain through the project reach was undertaken to inform separate, but associated, ecosystem planning activities, supported by cbec. Potential setback of the levee, as proposed through CMA 2 and 4, will expose floodplain to frequent inundation to varying degrees. The potential for, and frequency of, floodplain inundation is an important metric for habitat design since species such as riparian vegetation and aquatic biota require specific floodplain inundation characteristics to thrive. Specifically, the amount of floodplain inundation that could be expected during a 2-year recurrence interval flood was investigated, using modeled results by MBK, and water surface elevation measurements recorded by cbec during the high flow event of December 2010.

3.2.1 Modeled Water Surface Elevations

Modeling results were obtained from MBK who conducted region-wide 1-dimensional modeling of the potential impacts of CMAs 1 through 4. Figure 3-2 shows the water surface elevations of the 2- and 10-year recurrence interval events modeled through the project reach for CMA-2. This figure shows water surface elevations in the 2-year recurrence interval event varying from 26.03 feet (NAVD 88) at the upper extents of the project reach to 23.67 feet at the lower extents of the project reach. The corresponding magnitude of the modeled 2-year event was approximately 83,000 cfs.

3.2.2 Measured Water Surface Elevations

cbec installed two continuously recording water level recorders in November 2010, the locations of which are shown by Figure 3-3. A flood frequency analysis (FFA) was conducted on data downloaded from California Data Exchange Center (CDEC) at the Freeport gauge on the Sacramento River, as shown by Figure Figure 3-4. The Freeport gauge is approximately five miles downstream of the downstream extent of the project reach. The water level recorders through the project reach captured a high flow event in December 2010, that peaked around the 2-year recurrence interval, as shown by Figure 3-5, and based on the FFA conducted at Freeport. This 2-year recurrence interval event corresponded to a flow of approximately 72,300 cfs at the Freeport gauge. Further details of these field measurement can be obtained through an interim field data collection memo produced by cbec under Task Order 1, and included here as Appendix B.

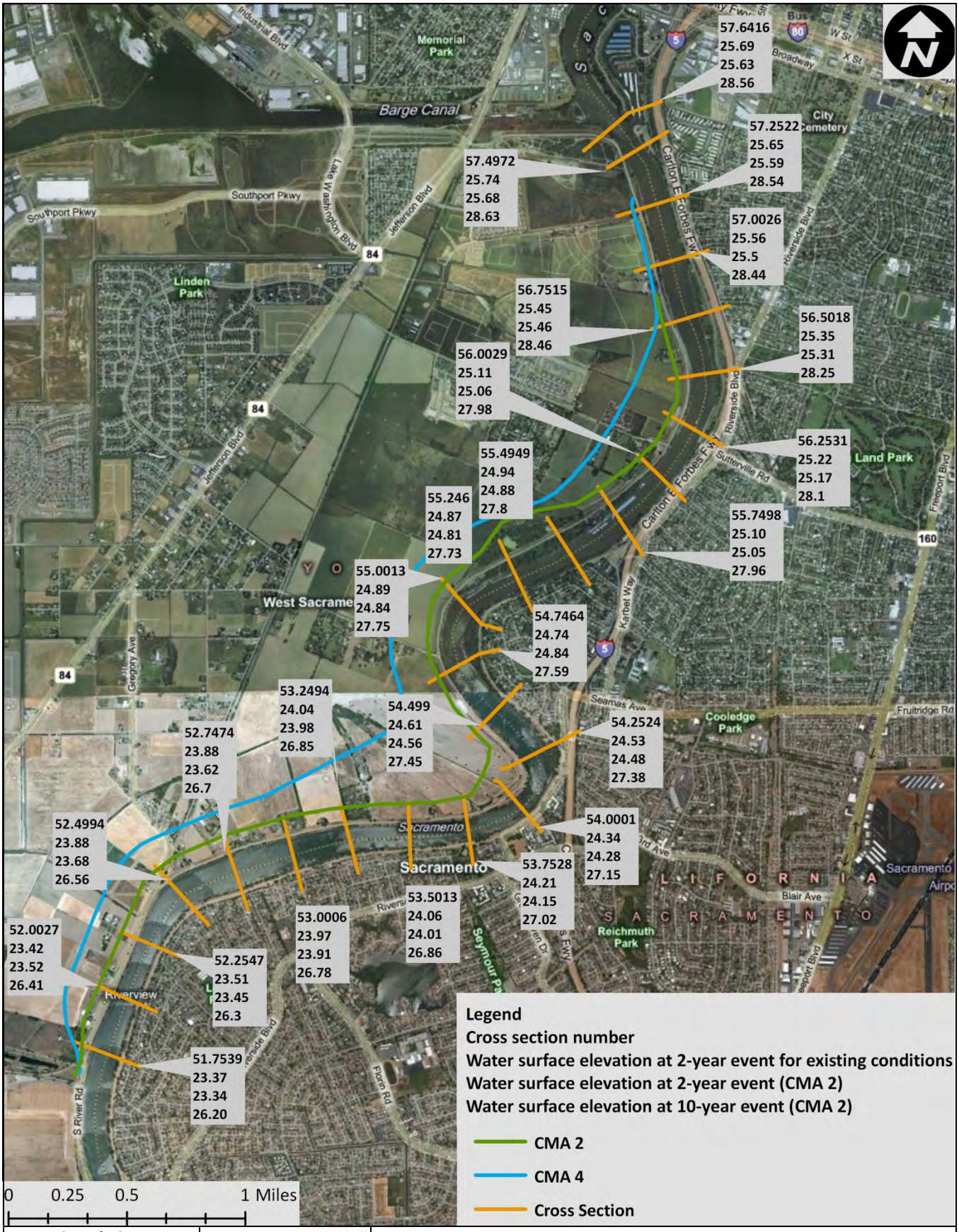
3.2.3 Frequency and Extent of Inundation

The water surface elevation of the 2-year recurrence interval event obtained from modeling and from field data were compared to topographic elevations on the floodplain obtained from mapping provided by HDR. Through visual observation, floodplain depths under CMA 2 and CMA 4 (setback alternatives) could vary from between 2 to 6 feet. During an event of this magnitude practically the whole of the setback area could be inundated. The duration of inundation has not been determined at this time but will be investigated through Task Order 3 activities.

It is interesting to note that the 2-year recurrence interval water surface elevations obtained through modeling and through field measurements varied by up to 1.8 feet. There are several possible reasons for this:

1. The FFA is based on a period of record of 97 years, and inherently the 2-year recurrence interval event may vary from 78,400 cfs to 67,340 cfs as shown by the upper and lower confidence limits, as shown by Figure 3-4. This results in a corresponding uncertainty of measured water surface elevation.
2. The modeled water surface elevations at the 2-year recurrence interval event are based on hydrology developed theoretically through a specific combination of storm centering, which is not necessarily reflected through the FFA of the measured data at Freeport.
3. The corresponding modeled 2-year recurrence interval flow is on average 83,000 cfs through the project reach, compared with a measured 2-year recurrence interval flow of approximately 72,000 cfs measured in December 2010. This directly explains why the modeled water surface elevations are up to 1.8 feet higher than the measured equivalent.
4. The measured water surface elevation was conducted through the current configuration of the levees bounding the Sacramento River. The modeled water surface elevations were obtained through specific levee setback conditions. Hence, differences in water surface elevation should be expected. Further observation of the modeled existing conditions and CMA 2 setback conditions for the 2-year recurrence interval flow shows that the water level may drop by 0.05 to 0.06 feet as a result of the setback (see Figure 3-2).

With consideration of the above factors, it is reasonable to assume at this preliminary stage that floodplain inundation will occur approximately at the 2-year recurrence interval event for CMA 2 and CMA 4, at depths between 2 to 6 feet. A more detailed investigation of floodplain frequency, duration, extent, depth, timing and rate of inundation will be conducted through 2-dimensional modeling under Task Order 3.



Notes: 2- and 10-year water surface elevation modeling done by MBK

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Modeled 2- and 10-Year Water Surface Elevations

Project No. 11-1003	Created By: LA	**Figure 3-2**

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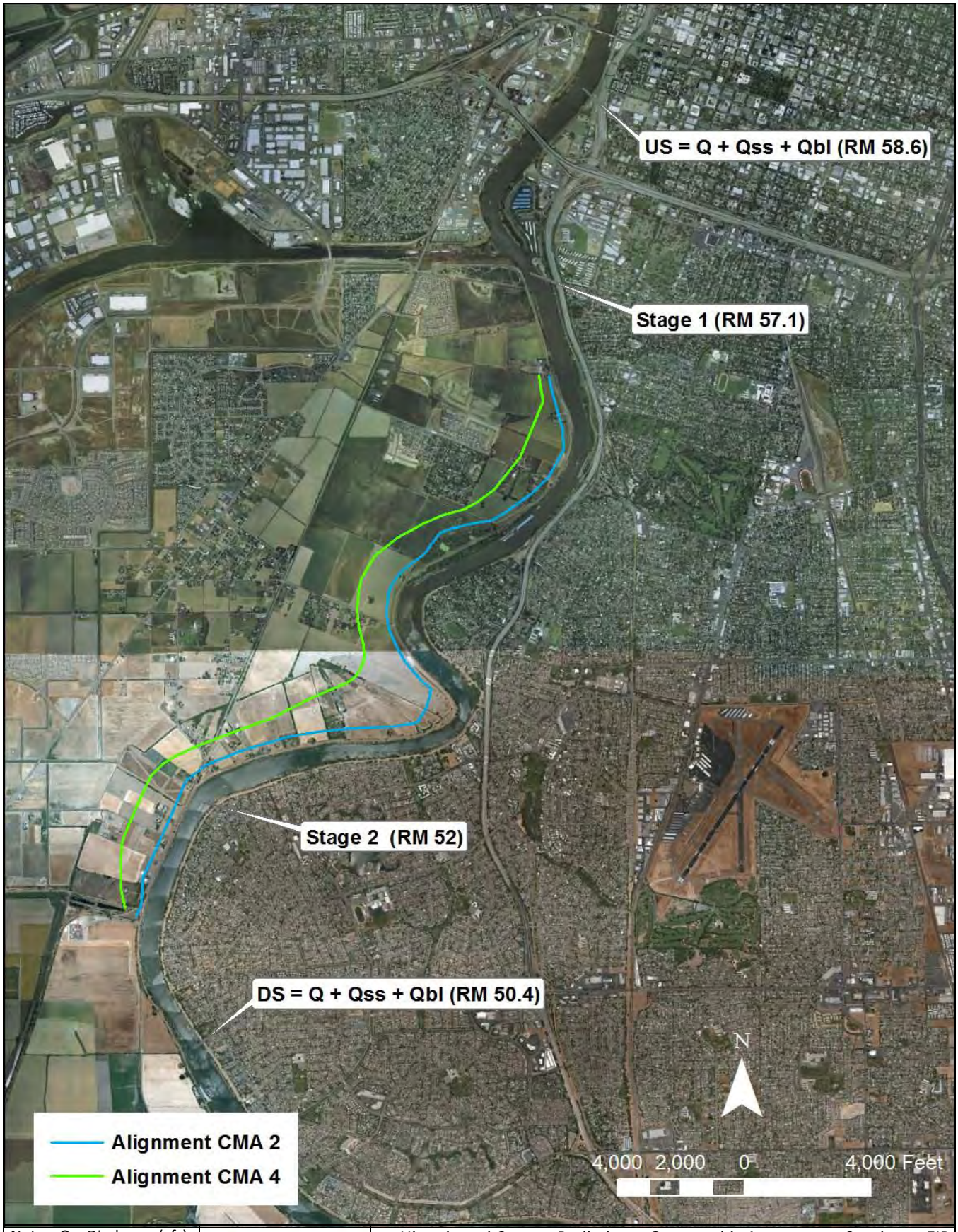

Notes: Q = Discharge (cfs)
Qss = Suspended Load
Qbl = Bedload

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Monitoring Locations

Project No. 11-1003	Created By: JS	**Figure 3-3**

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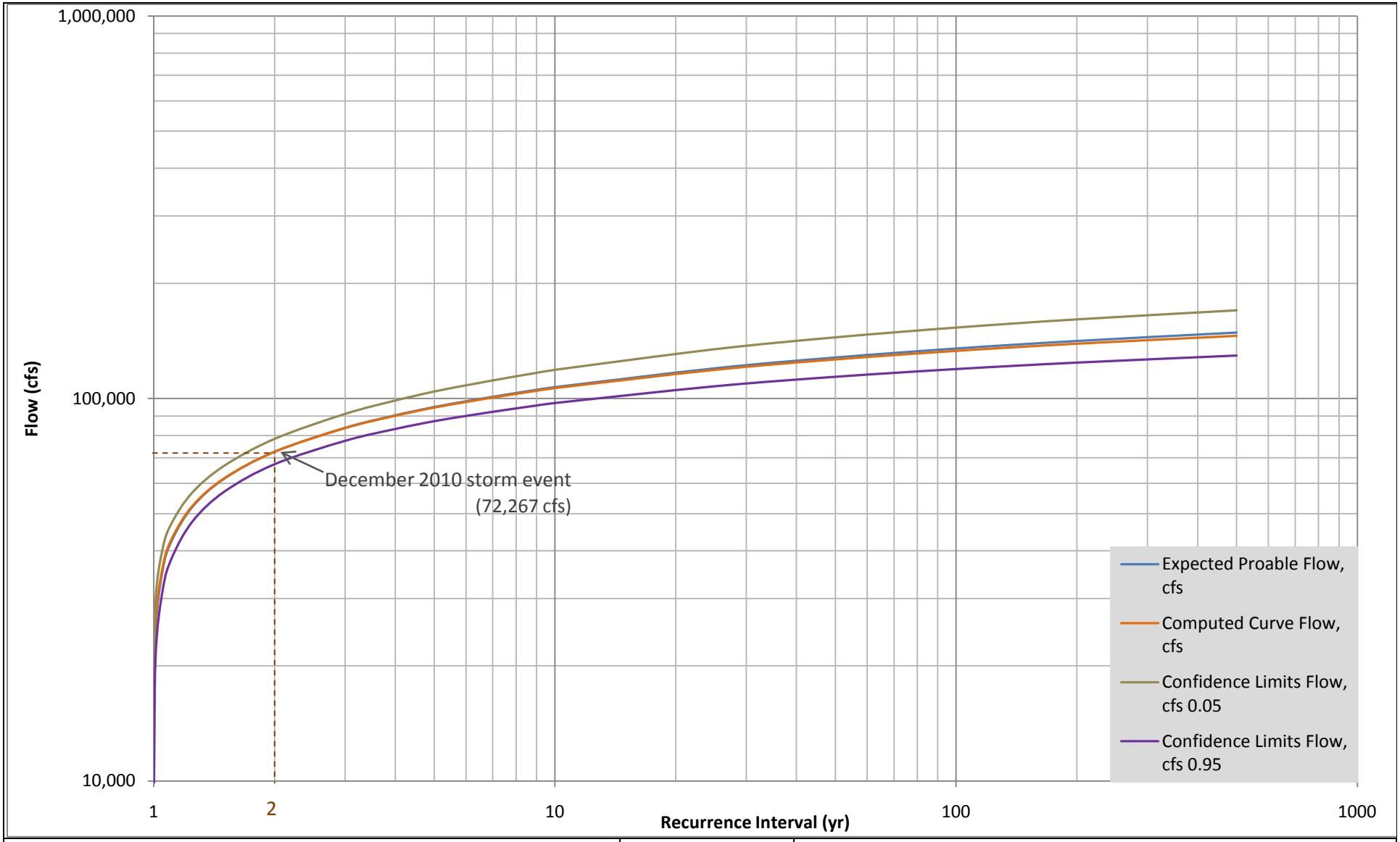

Notes: Flood frequency analysis for a 2-year event yields an expected probable flow of 72,592cfs. Peak discharge data for December storm event (12/21/2010) was 72,267cfs. Datum NAVD 88

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Flood Frequency Analysis of Flows at Freeport Gage

Project No. 11-1003	Created By: LA	**Figure 3-4**

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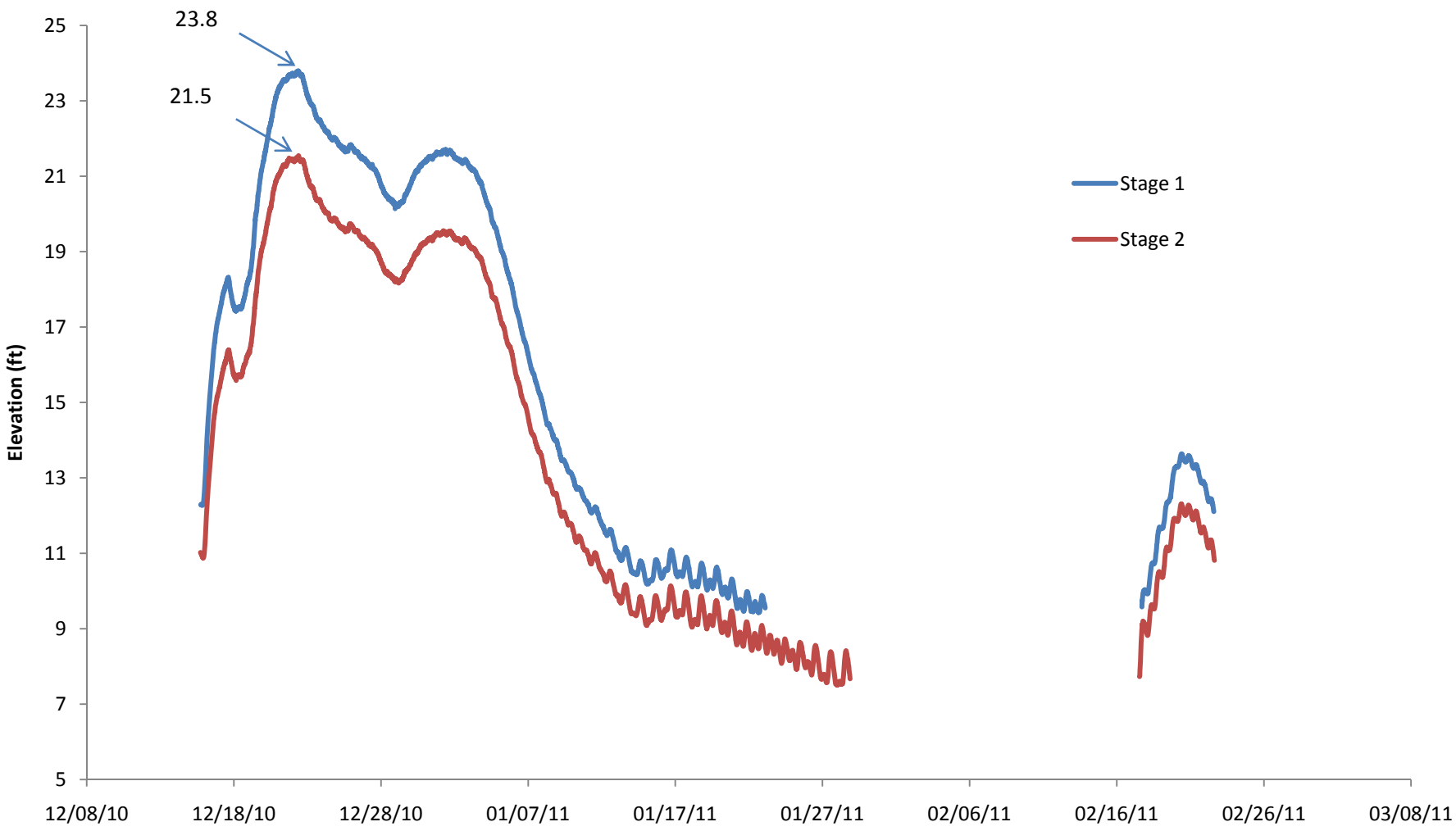

Notes: Elevation references the NAVD 88 vertical datum. Missing data is a result of the water level dropping below the elevation of stage recorder

Historic and Current Preliminary Geomorphic Assessment-Southport EIP

Measured State within Project Reach

Project No. 11-1003	Created By: LA	**Figure 3-5**

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6/7/2011

3.3 FIELD GEOMORPHIC ASSESSMENT

3.3.1 Methods

cbec staff assessed the existing geomorphic conditions of the project reach on August 10, 2011. Field staff made observations on the current state of the channel banks and levees from one mile upstream to one mile downstream of the proposed setback project. Staff used handheld GPS to map specific geomorphic features including areas of existing erosion and deposition.

3.3.2 Overview

The levees that exist throughout the study reach are in close proximity to the channel banks and the integrity of these banks and levees vary considerably. Downstream of Chicory bend, a majority of the levees and banks are reinforced with rip rap. Upstream of Chicory bend, about half of the levees are protected with rip rap (Figure 3-6). Since 2005, California Department of Water Resources (DWR), Sacramento Area Flood Control Agency (SAFCA), and the United States Army Corps of Engineers (USACE) implemented a number of levee repair and enhancement projects. cbec staff observed six constructed restoration projects consisting of riparian benches through the study reach (Figure 3-6). Two of these sites are on the right bank and ongoing vegetation management at these two sites will likely be affected by the construction of the setback

3.3.3 Bank and Levee Material

cbec staff observed the bank stratigraphy at an exposed cut bank on the right bank upstream of the project reach (Figure 3-6). A photograph of the stratigraphic section is presented in Figure 3-7. Surficial geologic maps (Figure 3-1) indicate that the stratigraphy is mix of overbank and crevasse splay deposits. The 10 ft. of visible stratigraphy at this site consist of predominantly unconsolidated medium to fine sand and silt. These deposits are very likely attributable to hydraulic mining, but determining the precise timing and provenance of these deposits could not be determined during this reconnaissance level effort. Other erosion sites throughout the study reach revealed a similar stratigraphic sequence. The levees throughout the study reach are sourced from dredged sands, local overbank, crevasse splay and relict channel deposits. The levees are generally composed of unconsolidated, relatively fine grained sediments that are porous and prone to seepage and erosion. Where not protected by revetments, placed levee material and bank material has the potential to erode rapidly during high discharge events and more progressively as a result of wind wave and boat wake induced erosion.

3.3.4 Erosional Features

cbec staff observed five areas of bank erosion through the study reach where unprotected channel banks are actively eroding (Figure 3-6). On the right bank immediately upstream of the proposed upstream breach, the levee is unprotected and eroding (Figure 3-6, Location 3). Figure 3-8 depicts areas of erosion along Location 3. Cross-section 3 (Appendix A) indicates that the geometry of the channel has changed very little at this location since 2008. However, because there have been no significant runoff

events since the winter of 2006, we cannot confidently define a trend of erosion by evaluating the differences between the 2008 and 2011 survey data.

On the left bank, adjacent to the proposed downstream breach, another small portion of unprotected levee appears to be eroding (Figure 3-6, Location 5). However, cross-section 14 indicates the bed and bank have accreted in the vicinity of this location since 2008. Figure 3-9 depicts the eroding levee across from the proposed downstream breach.

Erosion observed on the left bank, downstream of Chicory Bend (Figure 3-6, Location 4) appears to be eroding material deposited inboard of the levee since its construction; however the bend downstream of location 4 appears to focus a significant amount energy/shear at the toe of the levee. Downstream of this point, the toe of the levee on the left bank is armored with riprap, but upstream of the bend the levee toe is lacking armoring. Cross-section 9 (Appendix A), surveyed just upstream of Location 4, indicates very little change to the bank and bed at this location.

cbec Staff observed two additional areas of levee erosion, just upstream of the project reach, between the entrance to the deep water ship canal and the proposed breach (Figure 3-6, Locations 1 and 2). These areas of erosion occur along unprotected sections of levee adjacent to levee sections protected by riprap.

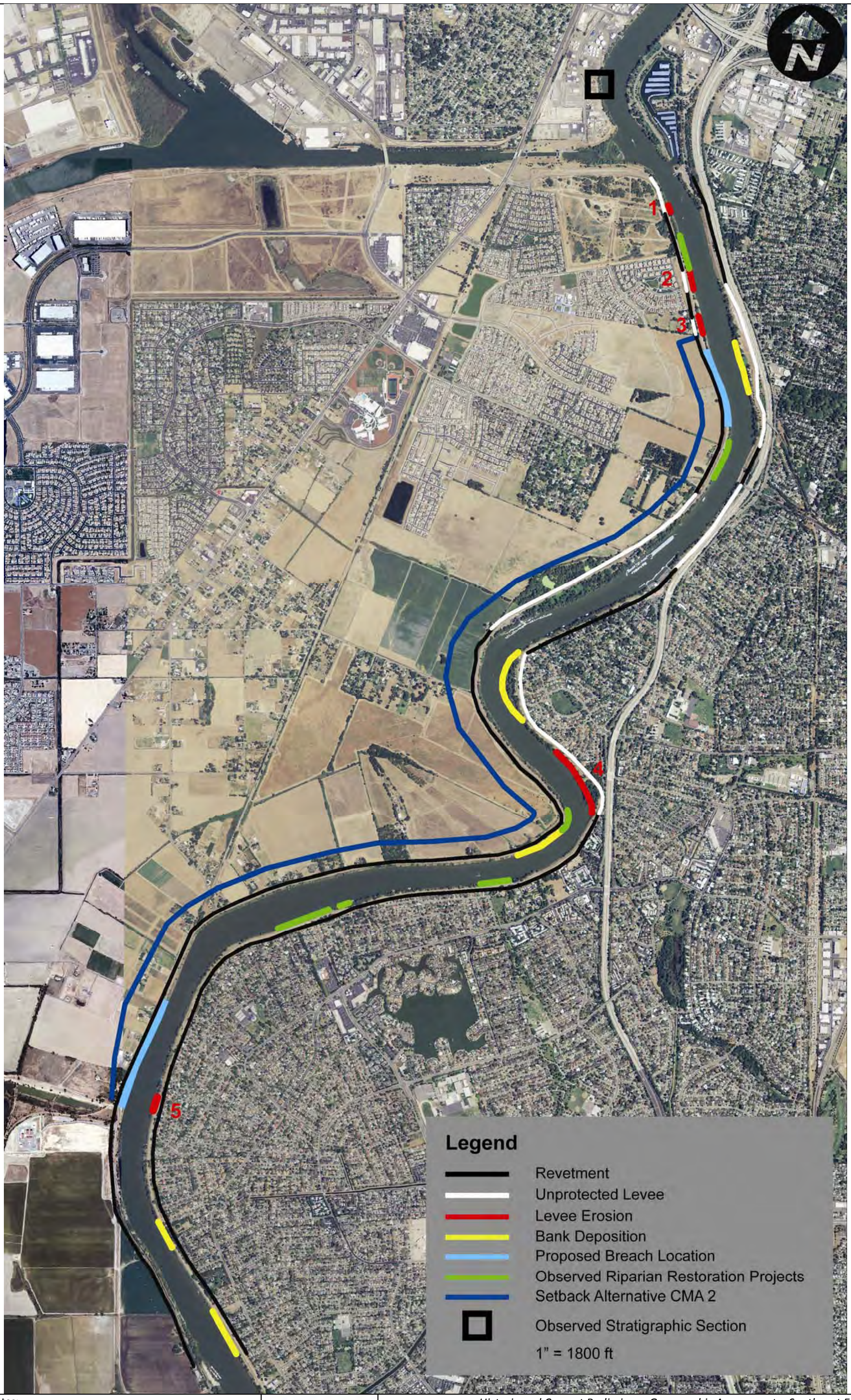
MBK's existing 1D model indicates a minimal increase in shear associated with the proposed setback alternatives. Since erosion exists in the majority of areas that lack armoring, even at locations where erosion typically wouldn't occur (inside of bends), it is hypothesized that the majority of the erosion at these sites are induced by boat wake / wave generated erosion due to the high level of recreational boat traffic in the project reach.

3.3.5 Depositional Features

Remnants of natural bar features exist within the project reach on the right bank between the Sacramento Yacht Club and Sherwood Harbor and on the left bank at Chicory Bend. Both of these bars support mature riparian vegetation including willow and cottonwood. Cross-section 6 and 7 (Appendix A) indicate minimal change in bed geometry between the Sacramento Yacht Club and Sherwood Harbor. Cross-section 8 (Appendix A) indicates that there has been erosion of this bar since 2008. Historical surveys and aerial photographs (Appendix A and Section 2-3, respectively) indicated that these bars were less vegetated and likely inundated more frequently. As more dams have been constructed on tributaries upstream of the study reach, large flow events have become more rare and attenuated. cbec Staff observed active deposition of sediment along the banks at other locations (Figure3-6), but deposition is limited to narrow un-vegetated bars at the toe of the levees. cbec does not believe that the proposed levee setback will not significantly affect the location and size of these depositional features; however cbec recommends post construction monitoring of these features.

3.3.6 Potential Morphologic Impacts of Setback

Section 4 presents the modeled (1D) changes in channel shear stress that may result from the proposed setback alternatives. The model indicates overall reduction in channel bed shear in the Sacramento River adjacent to the proposed breaches at all modeled flood levels for both the CMA-2 and CMA-4 alternatives. It is possible that the local reduction in shear may result in an increase deposition on the channel bed and on the banks for typical conditions. However, predicted accretion will likely be minimal and will likely not increase flood stage at these locations. In order to develop a more detailed picture of potential erosion and deposition, both in the existing main channel and within the floodplain created by the proposed setback alternatives, cbec is currently under contract to the develop and run a 2-dimensional hydrodynamic sediment transport model. That modeling effort is currently under contract to develop a 2-dimensional hydrodynamic sediment transport model to characterize existing and project conditions.



Notes:

cbec eco engineering

Historic and Current Preliminary Geomorphic Assessment – Southport EIP

Geomorphic Assessment Map

Project No. 11-1003	Created By: ED	**Figure 3-6**

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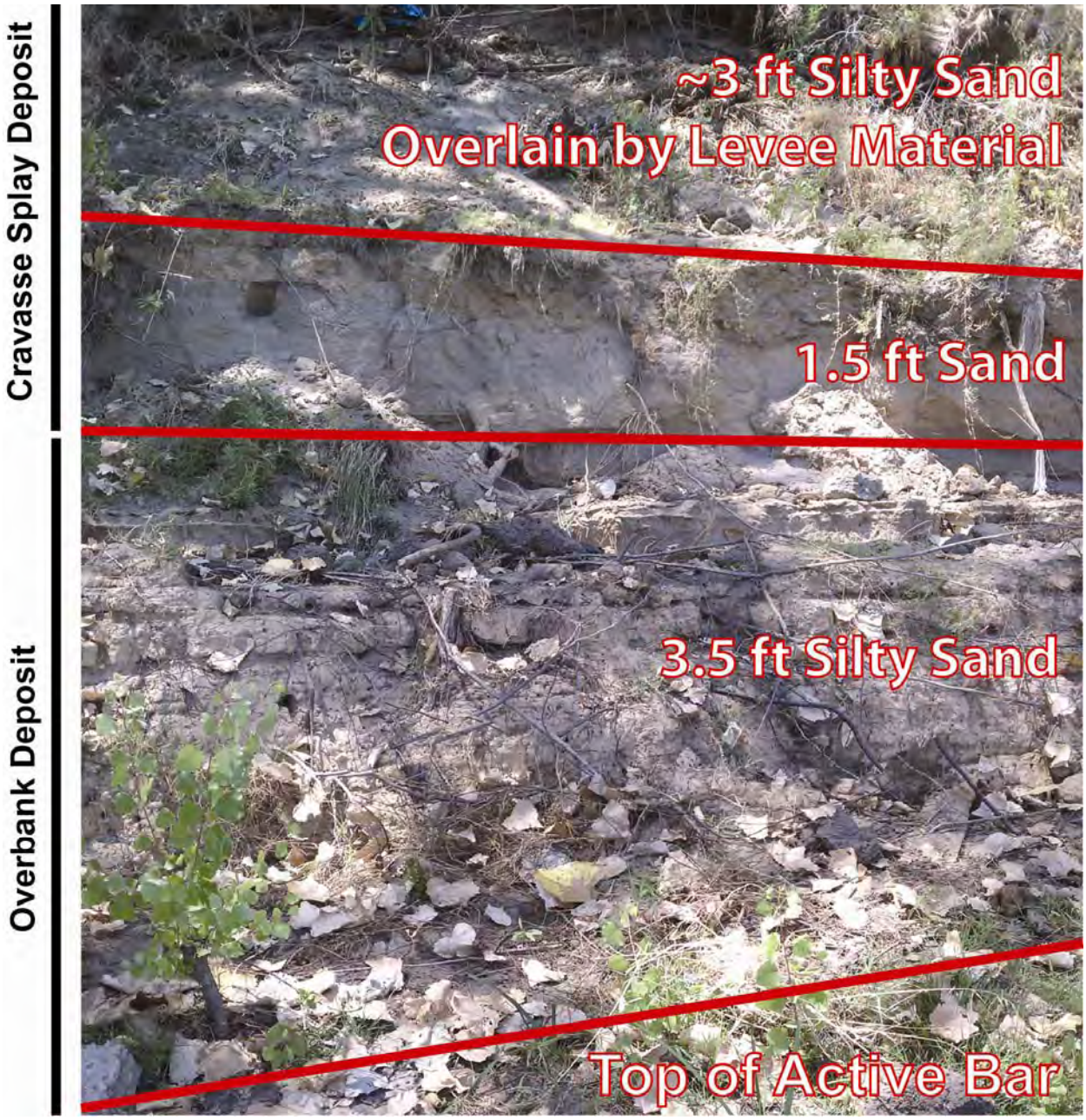

Notes:	cbec eco engineering	*Historic and Current Preliminary Geomorphic Assessment – Southport EIP* **Stratigraphic Cross-section**		
		Project No. 11-1003	Created By: ED	**Figure 3-7**

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Notes:	cbec eco engineering	*Historic and Current Preliminary Geomorphic Assessment – Southport EIP* **Levee Erosion Location 3**		
		Project No. 11-1003	Created By: ED	**Figure 3-8**

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Notes:	cbec eco engineering	*Historic and Current Preliminary Geomorphic Assessment – Southport EIP* **Levee Erosion Location 5**		
		Project No. 11-1003	Created By: ED	**Figure 3-9**

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3.4 CROSS SECTIONAL ANALYSIS

cbec surveyed 14 cross sections bathymetrically through the project reach in April 2011. An Ohmex Sonarmite single beam echosounder, dynamically coupled to a survey grade Trimble RTK GPS was deployed to a North River 21' jet boat. Bathymetric cross sections obtained through this effort were compared to two other sources of bathymetric data:

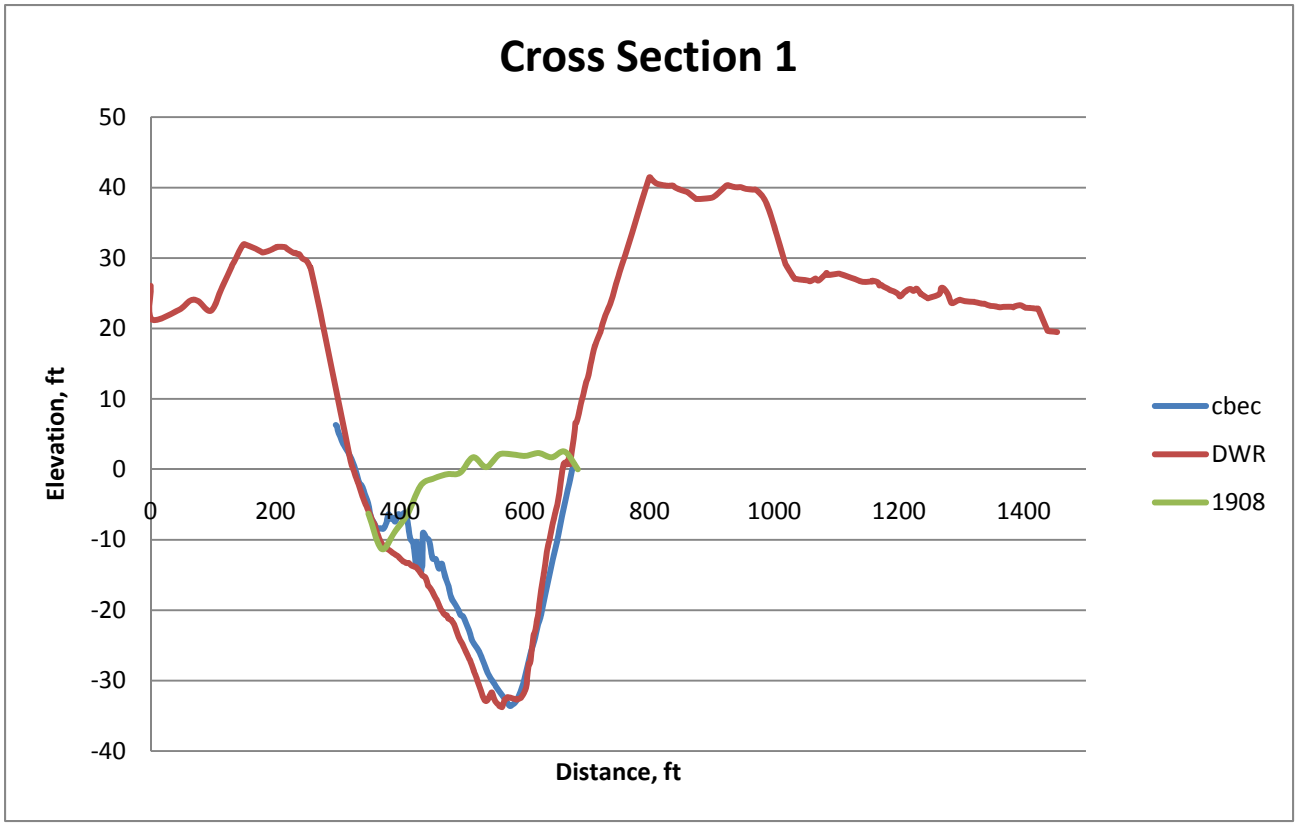
1. Cross sections extracted from a bathymetric digital terrain surface provided by HDR, and based off the Urban Levee Evaluation Program conducted by DWR in May 2008 (ULE).
2. Cross sectional elevation digitized from data obtained from the 1908 mapping shown by Figure 2-4.

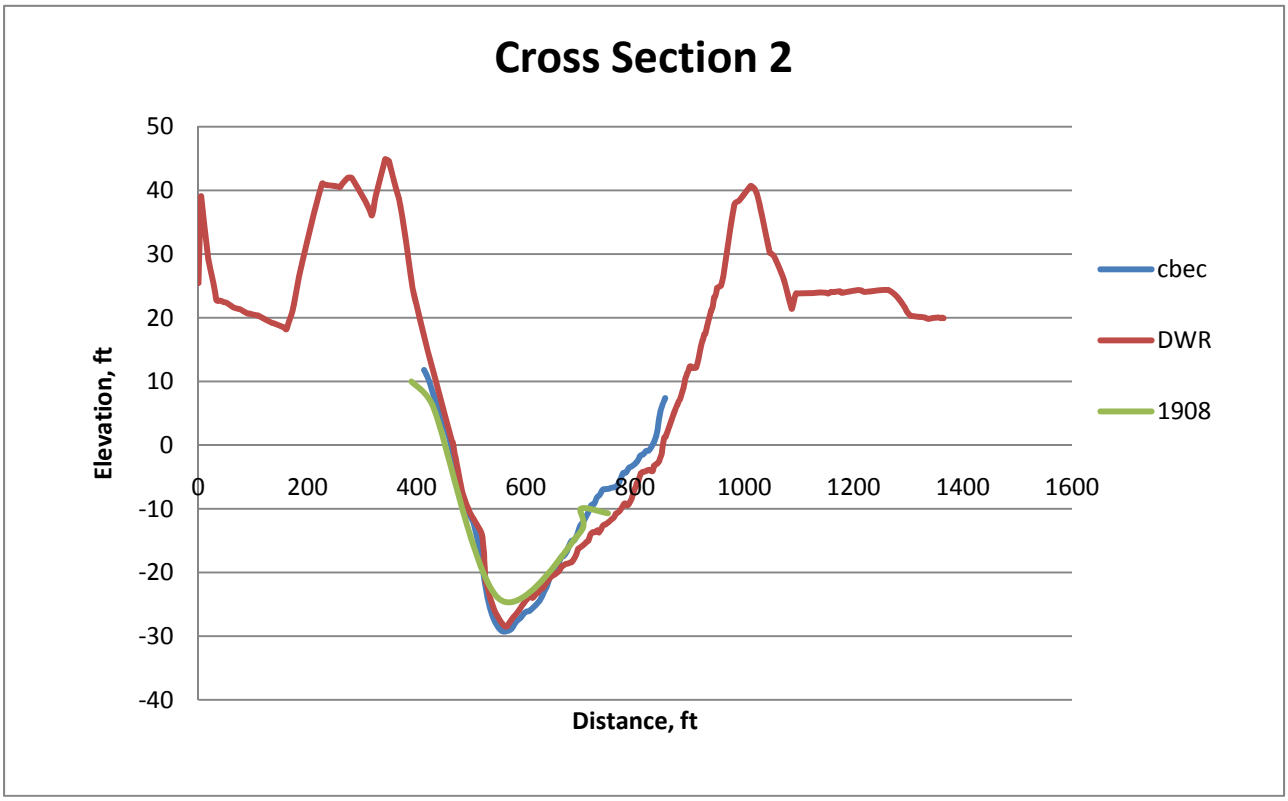
An example of the comparison of these data sources is shown by

Figure 3-10. Further cross sectional comparison is shown in Appendix A. Various observations can be made based on these analyses:

1. Bed elevations in the Sacramento River were substantially higher in elevation in 1908 (on average by 15 to 20 feet but up to 35 feet higher at one cross section) than present day.
2. The channel cross sections at present day are generally wider than in 1908.
3. Some of the bed elevations measured by cbec in April 2011 are slightly higher in elevation than when surveyed in 2008 as shown by the ULE data. It is inconclusive whether this is due to some small amount of sediment deposition or due to debris in the river providing false returns to sonar equipment during the time of surveying.

It is not surprising to observe that the bed elevations in the Sacramento River were higher in elevation in 1908. As a result of hydraulic gold mining in the later 1800s, vast amounts of sediment were transported from Foothill rivers and streams into tributaries and hence into the Sacramento River. Lower energy reaches of the Sacramento River, such as through the project reach, would have had vast amounts of these sediments deposited on the bed of the river. With the cessation of hydraulic mining in the early 1900s, and the construction of dams (sediment, flood and water supply) through the middle of the 20th century, the supply of sediment to the system was dramatically reduced. As a result a period of rapid erosion occurred causing incision of the bed and widening of the banks of the Sacramento River. Construction of levees through the mid- to late- 20th century, reduced the amount of river widening, but exacerbated the rate of bed incision. While bed incision has likely reduced in the last 20 to 30 years, bank erosion is an ongoing issue.





Notes: Veridical datum referenced NAVD 88	cbec eco engineering	*Historic and Current Preliminary Geomorphic Assessment- Southport EIP* **Sacramento River Cross Sectional Analysis**		
		Project No. 11-1003	Created By: LA	**Figure 3-10**

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9/1/2011

4 POTENTIAL GEOMORPHIC IMPACTS OF PROJECT

This section provides a preliminary assessment of the potential geomorphic impacts of possible implementation of a levee setback alignment. The potential impacts of possible implementation of alternatives adopting a strengthen-in-place alignment (CMA 1 and 3) were not analyzed since the conveyance capacity of the channel and floodplain through the project reach should not change, and hence the sediment transport capacity should not change. Currently, CMA 2 and CMA 4 include proposals for setback alignments of varying acreages, as shown by Figure 4-1 and Figure 4-2, respectively. The general effect of implementing either CMA 2 or CMA 4 will be to increase the available cross-sectional area for flow, or conveyance area during flood flows in excess of approximately a 2-year return period event. As a result of an increase in conveyance area, the flow velocity generally reduces. However, in certain locations, such as the entry or exit to a setback area, localized velocities may also increase.

4.1 REGION WIDE SEDIMENT TRANSPORT ASSEMENT

An analysis was undertaken in order to assess whether the corresponding reduction or increase in velocity, and hence bed and bank shear stresses, could present geomorphic problems in terms of sediment transport capacity, or excessive erosion, both through the project reach, and region wide. In terms of region wide, the geographic coverage of the assessment matches the hydraulic analysis undertaken by MBK Engineers, and upon which the results of this assessment are based.

4.1.1 Data Sources

Data on channel shear stress for the 2-, 10-, 25-, 50-, 100- and 200-year return period events under 'No Setback', 'CMA 2', and 'CMA 4' scenarios were obtained, along with river centerline and cross section shapefiles, using a 1-dimensional hydrodynamic model (HEC-RAS) developed by MBK Engineers. The shear stress data obtained represent the maximum values simulated.

4.1.2 Methods

Percent change in channel shear stress was calculated between 'No Setback', or existing conditions and the CMA 2 and CMA 4 scenarios. Percent change in channel shear stress, along with actual shear stress from 'No Setback' conditions and CMA 4 scenario, were imported into ArcMap and referenced to the corresponding cross section based on river station. Percent change in channel shear stress and the actual channel shear stress was symbolized for all flood events. The symbology for actual shear stress is based off the critical shear stress values as described by Fischenich (2001), which gives the upper limit thresholds needed to move sediment of various sizes. Table 4-1 provides these values in pounds per square foot (lb/sf).

Table 4-1 Critical Shear Stress Values and Symbols

Symbol	Class Name	Critical Shear Stress (lb/ft^2)
	Very Coarse Gravel	0.54
	Coarse Gravel	0.25
	Medium Gravel	0.12
	Fine Gravel	0.06
	Very Fine Gravel	0.03
	Very Coarse Sand	0.01
	Coarse Sand	0.006

4.1.3 Results

Table 4-2 and Table 4-3 summarizes the maximum and minimum percent change in shear stress over the reach (calculated on a cross-sectional basis) between the existing conditions and setback alignments proposed under CMA 2 and CMA 4, respectively. Table 4-4 shows the values of absolute shear stress through the project reach for existing conditions and for the setback alignments proposed under CMA 4.

Table 4-2 shows minimum and maximum values for percent change in channel shear stress ranging from a percent reduction in shear stress of just over 32% in the 200-year event for CMA 2, to a percent reduction in shear stress of just over 45% in the 200-year event for CMA 4, as shown by Table 4-3. Relative increases in shear stress for both CMA 2 and 4 are well below 10%, and are considered insignificant.

Table 4-2 Percent Change in Channel Shear Stress Compared to Existing Conditions in CMA 2

	Max % Change			Min % Change		
Return Period of Flood Events	Change in Shear Stress (lb/ft^2)	Existing Shear Stress (lb/ft^2)	CMA 2 Shear Stress (lb/ft^2)	Change in Shear Stress (lb/ft^2)	Existing Shear Stress (lb/ft^2)	CMA 2 Shear Stress (lb/ft^2)
2	6%	0.15	0.16	-21%	0.19	0.15
10	6%	0.16	0.17	-27%	0.22	0.16
25	5%	0.17	0.18	-26%	0.19	0.14
50	6%	0.18	0.19	-30%	0.20	0.14
100	6%	0.18	0.19	-30%	0.20	0.14
200	7%	0.14	0.15	-32%	0.20	0.14

Table 4-3 Percent Change in Channel Shear Stress Compared to Existing Conditions in CMA 4

	Max % Change			Min % Change		
Return Period of Flood Events	Change in Shear Stress (lb/ft^2)	Existing Shear Stress (lb/ft^2)	CMA 4 Shear Stress (lb/ft^2)	Change in Shear Stress (lb/ft^2)	Existing Shear Stress (lb/ft^2)	CMA 4Shear Stress (lb/ft^2)
2	7%	0.13	0.14	-21%	0.19	0.15
10	6%	0.16	0.17	-31%	0.22	0.15
25	5%	0.18	0.19	-37%	0.24	0.15
50	5%	0.18	0.19	-40%	0.25	0.15
100	6%	0.15	0.16	-40%	0.25	0.15
200	7%	0.28	0.30	-45%	0.31	0.17

Generally, region-wide impacts of the potential implementation of CMA 2 and 4 are negligible. However, some localized features appeared to be significant and required further assessment.

Figure 4-3 and Figure 4-4 show the percent change in shear stress between existing and with the setback alignment proposed under CMA 2, for the 2-, 5- and 25-year and the 50-, 100- and 200-year return period events, respectively. In the 2- and 5-year return period event, changes in shear stress observed are negligible, with less than a 10% change. In the 25-year event, one small reach may experience greater than a 20% reduction in shear stress. This reduction in shear stress is observed to increase slightly with increasing return period interval up to the 200-year event. No increases in shear stress greater than 5% are observed, based on the model results. These increases are determined to be negligible.

Figure 4-5 and Figure 4-6 show the percent change in shear stress between existing and with the setback alignment proposed under CMA 4, for the 2-, 5- and 25-year and the 50-, 100- and 200-year return period events, respectively. In the 2- and 5-year return period event, changes in shear stress observed are negligible, with less than a 10% change. In the 50-, 100- and 200-year return period events, shear stress is generally predicted to reduce with increasing return period events, but generally only up to a reduction of 10%. In one small reach, similar to the results obtained from CMA 2, shear stress may reduce by in excess of 20%. No increases in shear stress greater than 5% are observed, based on the model results. These increases are determined to be negligible.

Generally, localized increases in shear stress could be problematic in terms of the potential for increased erosion as a result of the potential setback alignments. Shear stress typically increases upstream a levee setback because of the local reduction in water surface elevation within setback reach. The localized reduction in elevation provides for a increase in the water surface slope immediately upstream of the setback reach as the upstream water surface elevation remains unchanged. Regionally, increases in

shear stresses for all scenarios does not exceed 5%. The potential "noise" and variability of these types of analysis could potentially be 10% or more, and therefore, the increases in shear stresses regionally were considered to be negligible. However, reductions in shear stresses may indicate the potential for sediment deposition. Significant deposition could be an issue for local marinas or navigation generally in the region. Since reduction in shear stress of up to 45% were observed for the 200-year return period event between existing conditions and the proposed setback alignment of CMA 4, additional analysis was undertaken in order to assess the sediment transport capacity under CMA 4.

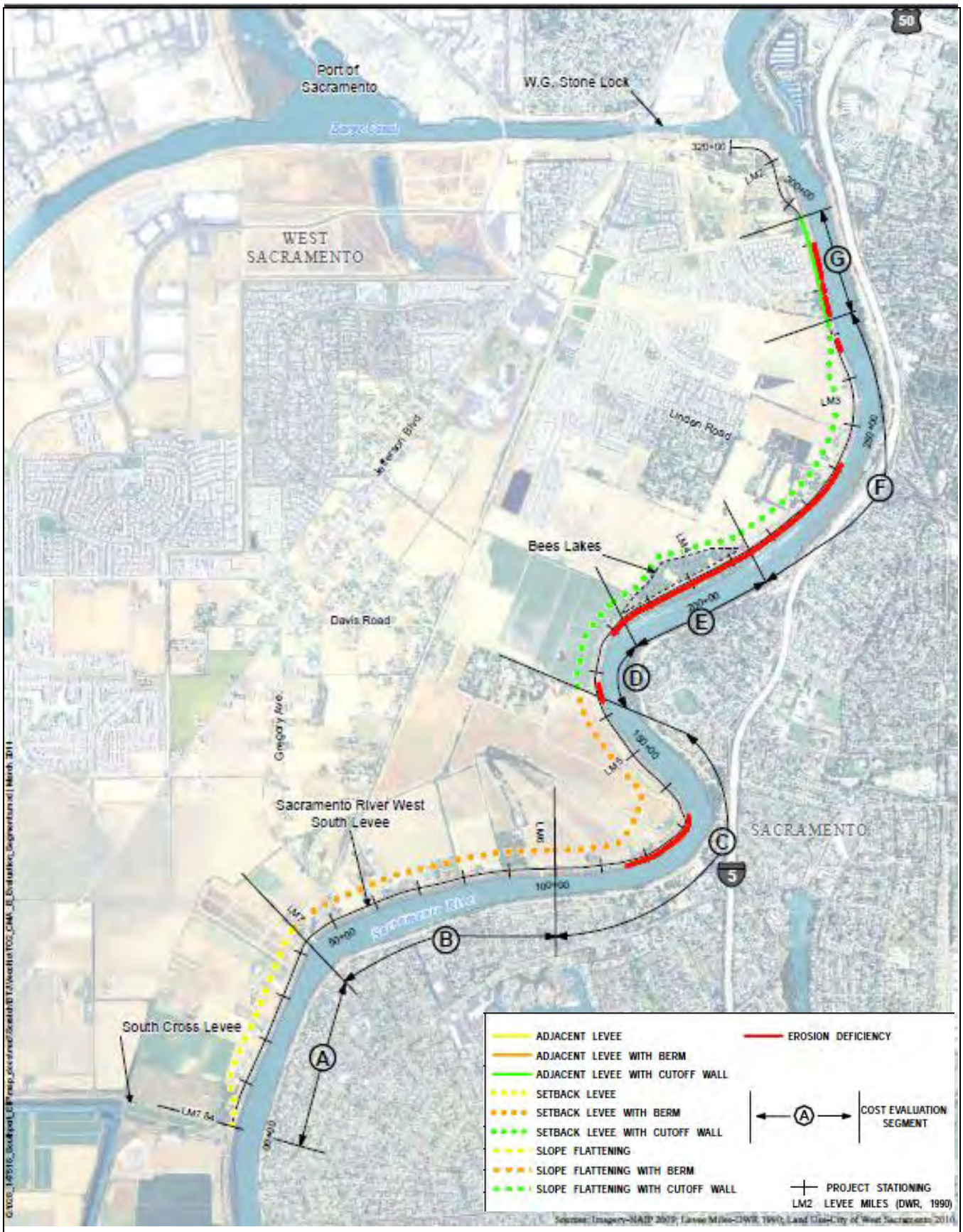
Table 4-4 shows the absolute shear stress maximum values for current conditions, compared to conditions under CMA 4.

Table 4-4 Absolute Shear Stress, Maximum Values for Current Conditions and CMA 4

Flood Year	No Setback Max (lb/sf)	CMA 4 Max (lb/sf)
2	0.29	0.29
10	0.34	0.35
25	0.37	0.40
50	0.38	0.43
100	0.33	0.46
200	0.35	0.45

Table 4-4 shows the maximum shear stress values observed among all cross sections for CMA 4. The shear stress values do not represent individual cross sections, as they do in Table 4-2 and Table 4-3. The intention of Table 4-4 is to demonstrate that sediment will likely still be transported under CMA 2 or 4 conditions, rather than be deposited.

Further, Figure 4-7 and Figure 4-8 show the absolute shear stress under existing conditions for the 2-, 10-, 25-, 50-, 100- and 200-year return period events. In can be observed that the shear stresses under these conditions are of sufficient magnitude to transport coarse to very coarse gravels. Figure 4-9 and Figure 4-10 show the absolute shear stress under the proposed setback alignment conditions for the 2-. 10-, 25-. 50-, 100- and 200-year return period events. It can be observed that the shear stresses under these conditions, while the shear stresses are generally slightly lower than under existing conditions, still have sufficient magnitude to transport coarse to very coarse gravels. Therefore, it is likely that sediment deposition will not be increased between the 2- and 200-year events as a result of proposed setback alignments.

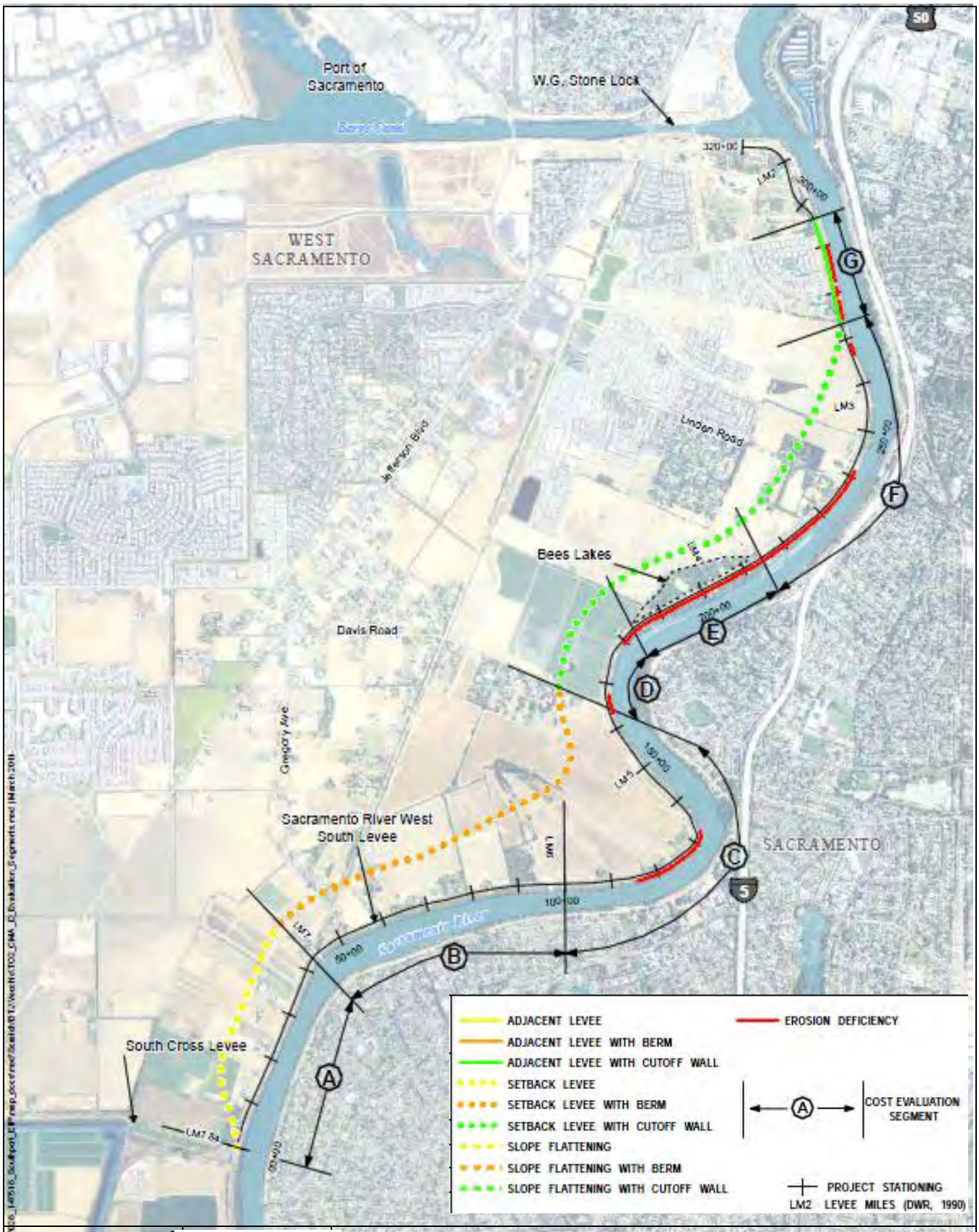


Notes: Map courtesy of HDR.

Historic and Current Preliminary Geomorphic Assessment- Southport EIP

Proposed Levee Setback Alignment- CMA 2

Project No. 11-1003	Created By: LA	**Figure 4-1**

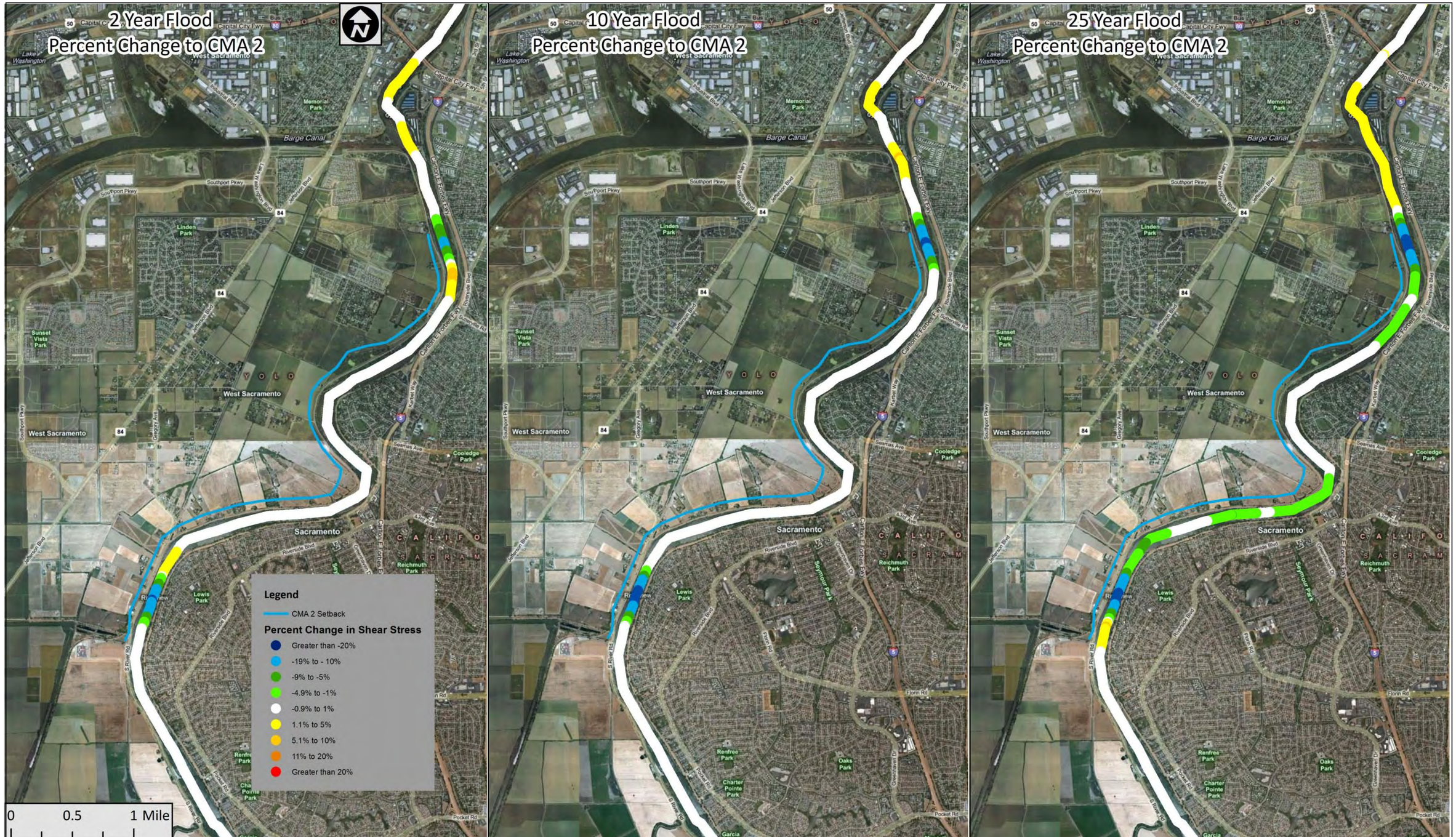


Notes: Map courtest of HDR.

Historic and Current Preliminary Geomorphic Assessment- Southport EIP

Proposed Levee Setback Alignment- CMA 4

Project No. 11-1003	Created By: LA	**Figure 4-2**



Notes: Orthoimagery courtesy of Bing Maps.

Historic and Current Preliminary Geomorphic Assessment- Southport EIP

Channel Shear Stress Percent Changes CMA2- I

Project No. 11-1003	Created By: LA	**Figure 4-3**

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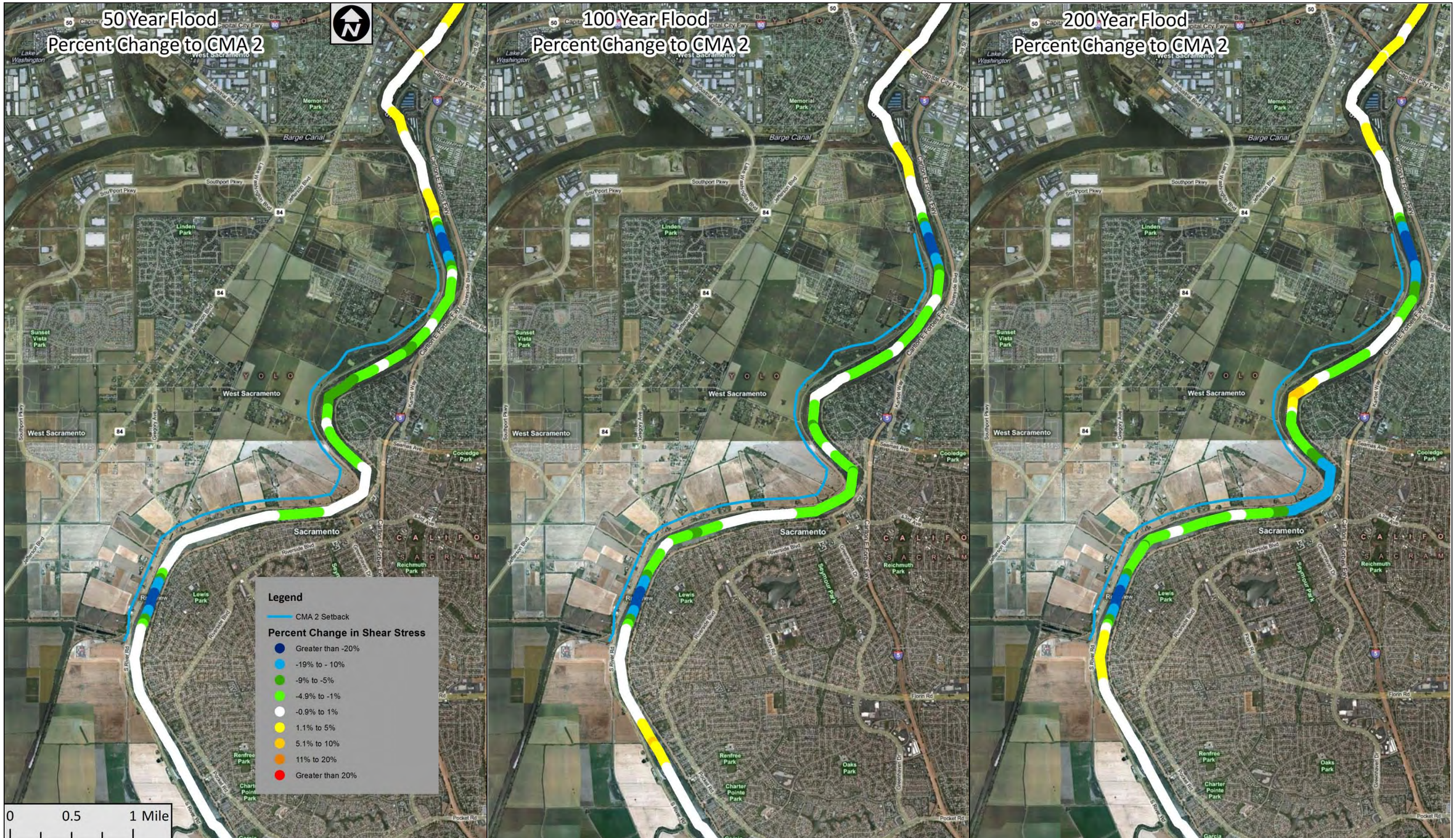

Notes: Orthoimagery courtesy of Bing Maps.

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Historic and Current Preliminary Geomorphic Assessment- Southport EIP

Channel Shear Stress Percent Changes CMA2 II

Project No. 11-1003	Created By: LA	**Figure 4-4**

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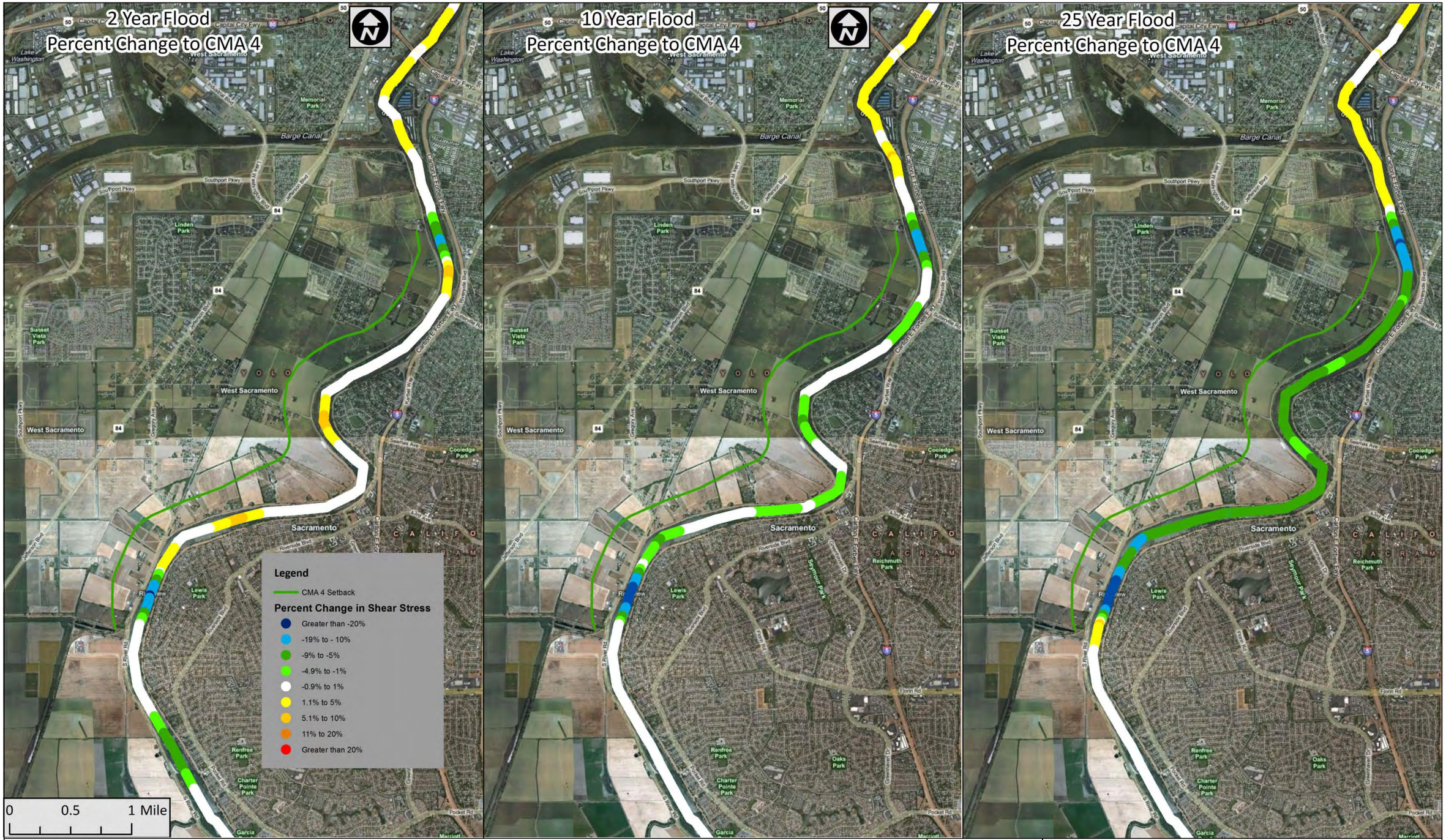

Notes: Orthoimagery courtesy of Bing Maps.

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Historic and Current Preliminary Geomorphic Assessment- Southport EIP

Channel Shear Stress Percent Change CMA4

Project No. 11-1003	Created By: LA	**Figure 4-5**

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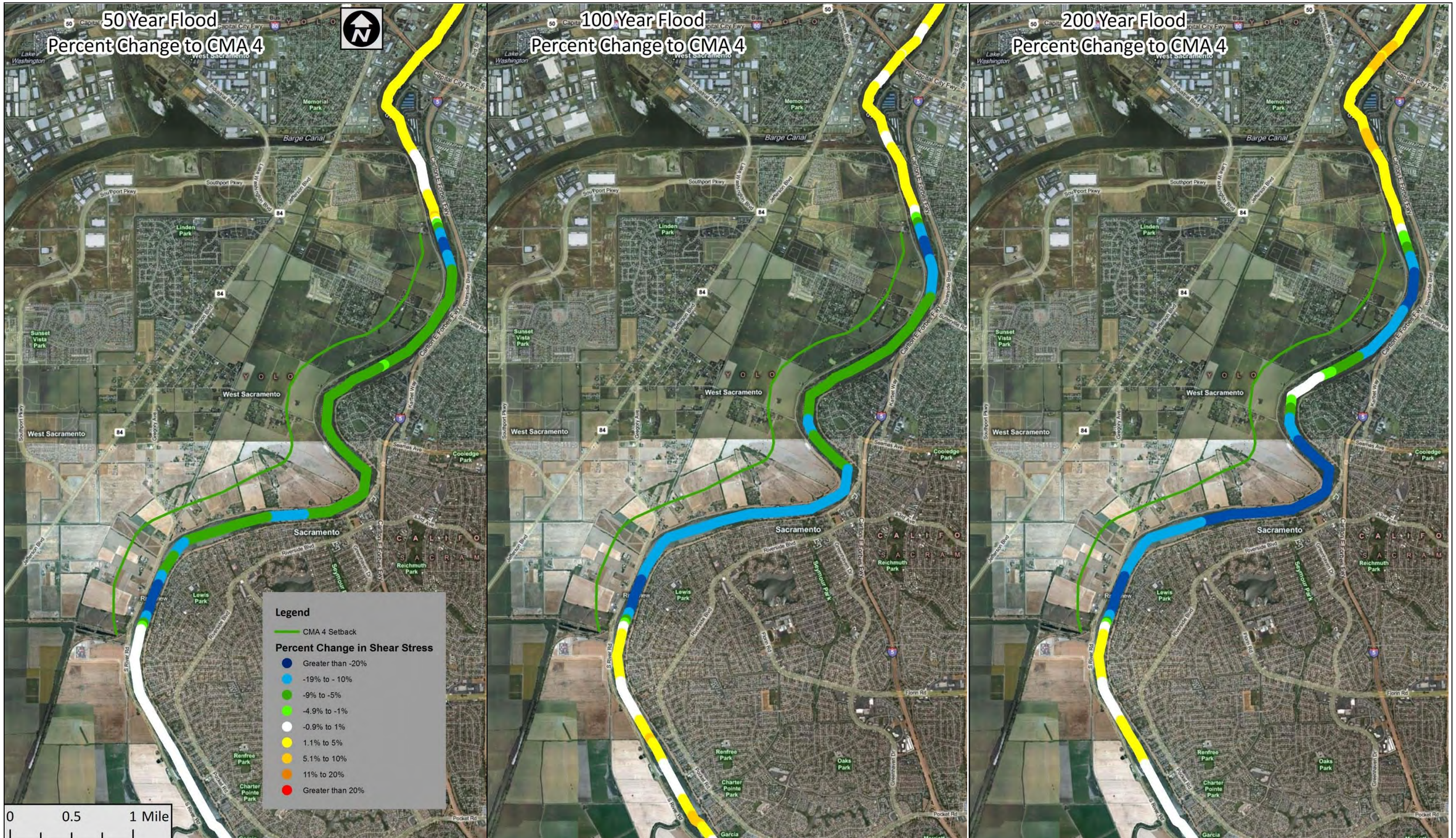

Notes: Orthoimagery courtesy of Bing Maps.

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Historic and Current Preliminary Geomorphic Assessment- Southport EIP

Channel Shear Stress Percent Changes CMA4 II

Project No. 11-1003	Created By: LA	**Figure 4-6**

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Shear stress limits based on Fischenich, 2001. Colors represent upper limit of shear stress power. Orthoimagery courtesy of Bing Maps.

Historic and Current Preliminary Geomorphic Assessment- Southport EIP

Absolute Channel Shear Stress Existing- I

Project No. 11-1003	Created By: WGW	**Figure 4-7**

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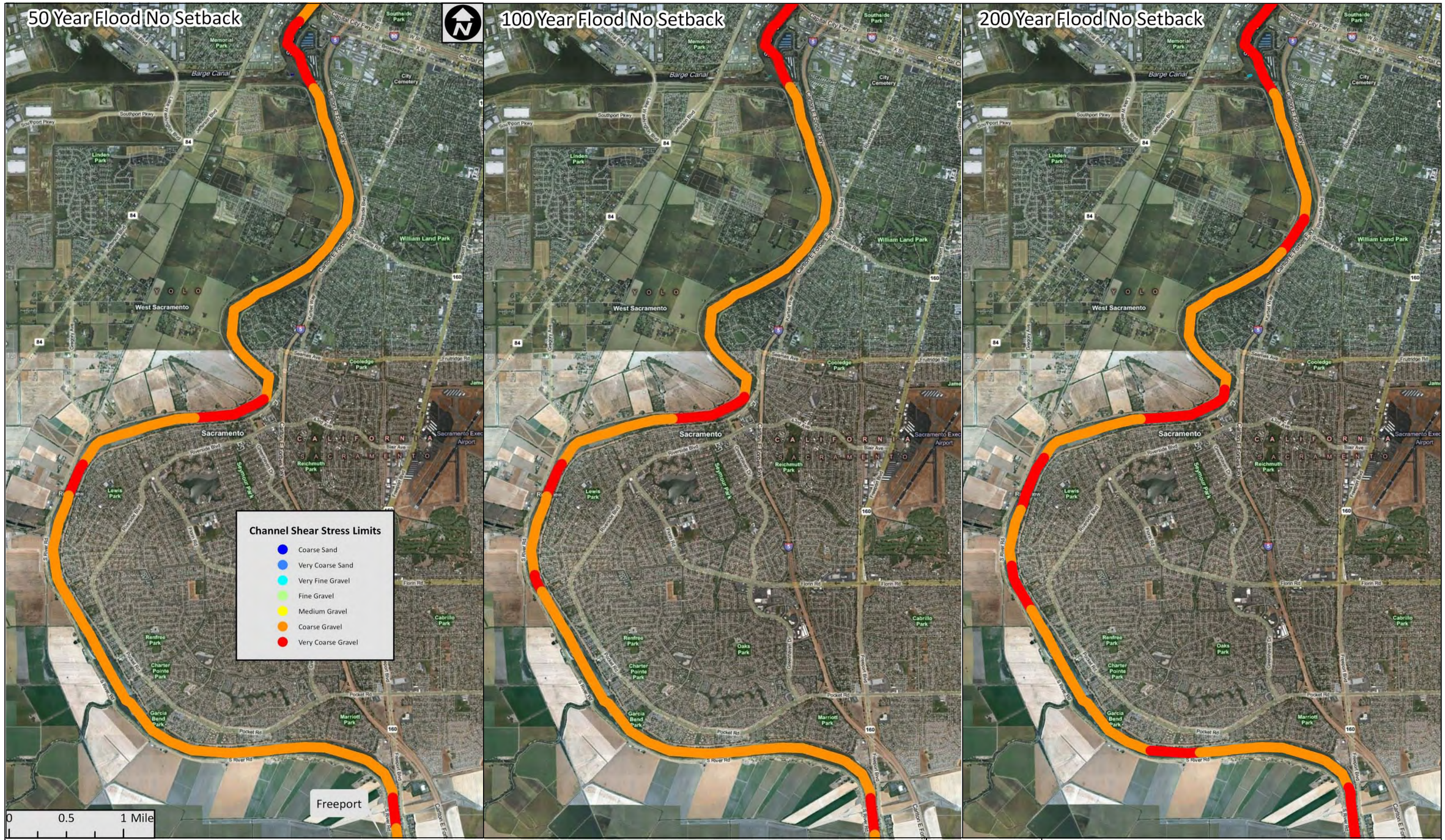

Notes: Shear stress limits based on Fischenich, 2001. Colors represent upper limit of shear stress power. Orthoimagery courtesy of Bing Maps.

Historic and Current Preliminary Geomorphic Assessment- Southport EIP

Absolute Channel Shear Stress Existing-II

Project No. 11-1003	Created By: WGW	**Figure 4-8**

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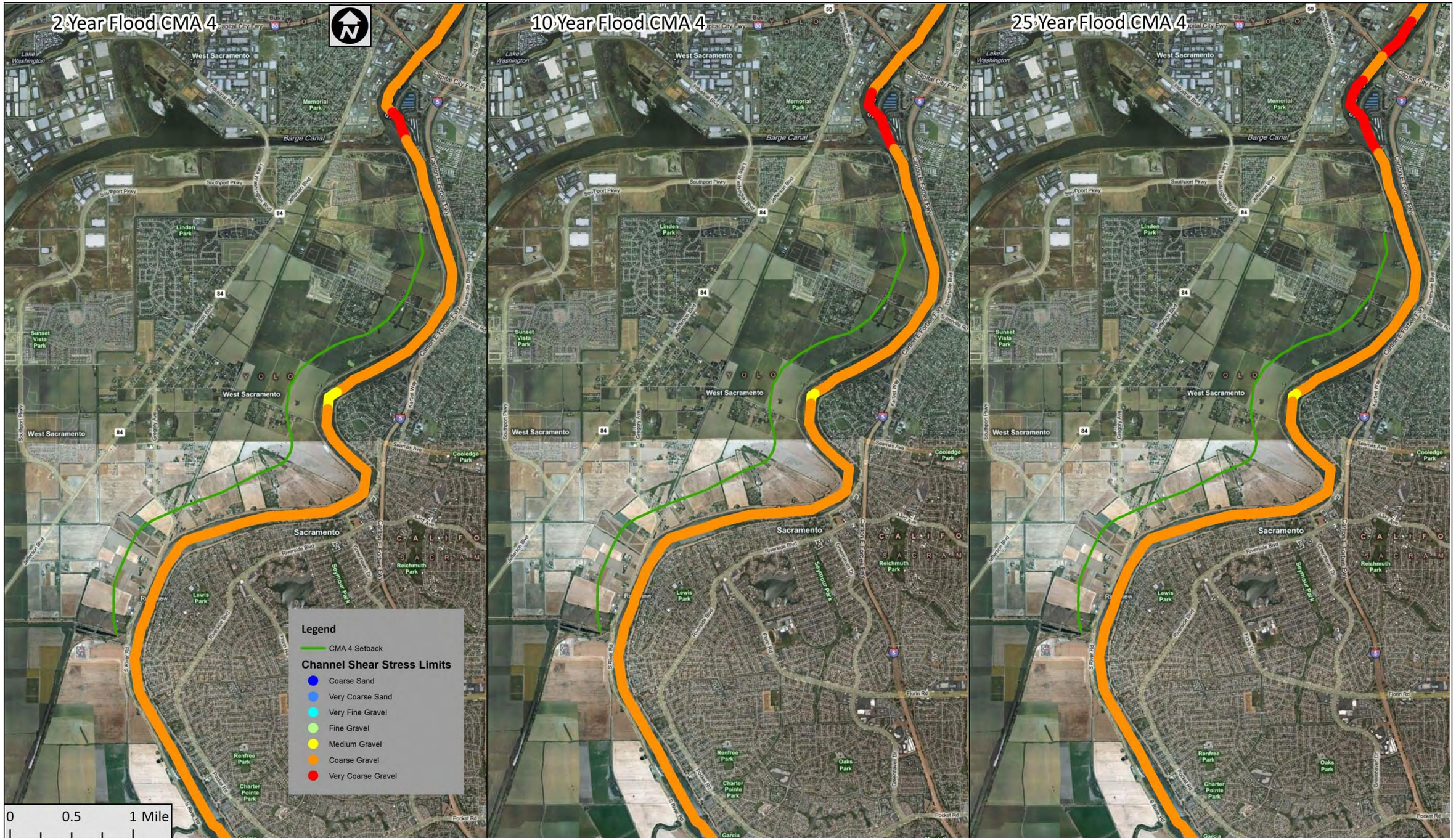

Notes: Orthoimagery courtesy of Bing Maps. Colors represent upper limit of shear stress based on Fishenice, 2001.

Historic and Current Preliminary Geomorphic Assessment- Southport EIP

Absolute Channel Shear Stress CMA4- I

Project No. 11-1003	Created By: LA	**Figure 4-9**

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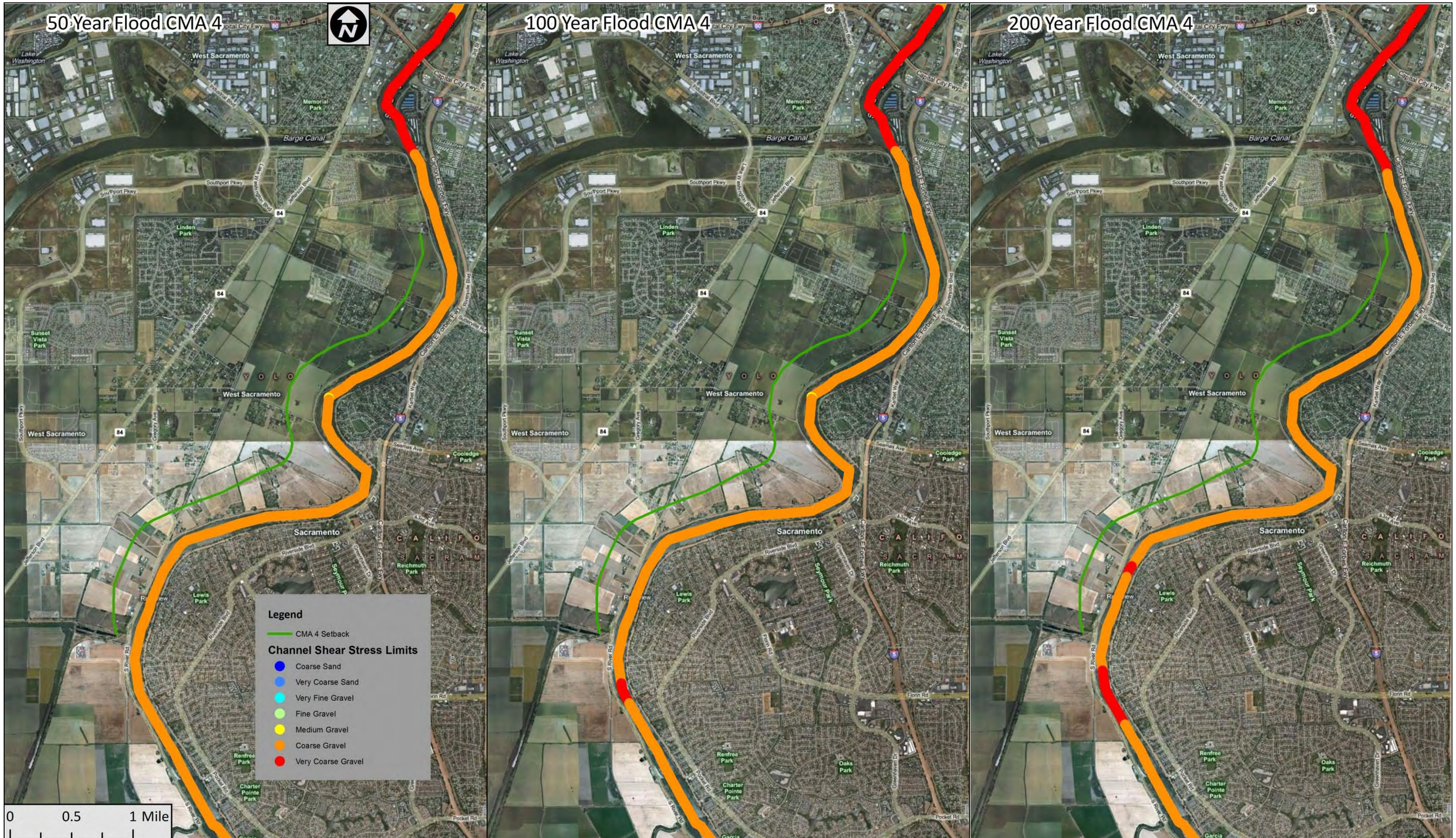

Notes: Shear stress limits based on Fischenich, 2001. Colors represent upper limit of shear stress power. Orthoimagery courtesy of Bing Maps.

Historic and Current Preliminary Geomorphic Assessment- Southport EIP

Absolute Channel Shear Stress CMA4- II

Project No. 11-1003	Created By: LA	**Figure 4-10**

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5 CONCLUSIONS

The general conclusions that can be made as a result of investigations undertaken through this study include:

1. Since the late 1800s the planform geometry of the Sacramento River through the project reach has been "locked" in place by levees and rip-rap and has not changed significantly to date. Localized changes in depositional bars and other in-channel sedimentation features have been observed over time.
2. In the early 1900s large amounts of sediment were deposited in the Sacramento River as a result of hydraulic mining practices in Sierra Foothill rivers and streams. This raised the bed substantially. Subsequently, the channel incised and widened leading to its current form, as a result of upstream anthropogenic impacts, such as reservoir and dam construction, and urbanization. Today, the thalweg elevation of the river is up to up to 20 feet lower than in the early 1900s.
3. The geology of the floodplain through the project reach is complex and is being closely studied for potential levee impacts by Blackburn Consulting.
4. The floodplain of the Sacramento River through the project reach should be inundated in at least the 2-year recurrence interval event, or more frequently, from depths ranging from 2 to 6 feet, under levee setback conditions.
5. Few relic floodplain features remain today, upon which to base restoration strategies. Bees Lake is a notable exception, although it is unclear if this is a relic feature, and is more likely a product of anthropogenic influences and levee construction.
6. Regionally, sediment transport impacts of the proposed levee setback are negligible. Frequent bankfull events primarily define channel morphology in river systems such as the Sacramento River. Out-of-bank flows under levee setback conditions will affect the frequency of bankfull events to a negligible extent, and therefore will likely not influence channel morphology over time. Locally, shear stresses through the project reach should be substantially reduced, which may benefit existing bank erosion issues. Reduction in shear stresses should not increase deposition through the project reach.

5.1 RECOMMENDATIONS FOR FUTURE ANALYSIS

This study represents a preliminary assessment only. Additional field reconnaissance and data collection will be required leading to final design. In addition, detailed 2-dimensional sediment transport analysis will be conducted under a subsequent task order to identify potential impacts to specific river and floodplain features, such as areas of potential erosion or deposition.

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APPENDIX A – CROSS SECTIONAL ANALYSIS

Notes: Orthoimagery courtesy of Bing Maps.	cbec eco engineering	*Historic and Current Preliminary Geomorphic Assessment- Southport EIP* **cbec Cross Section Locations**		
		Project No. 11-1003	Created By: LA	**Appendix A-1**

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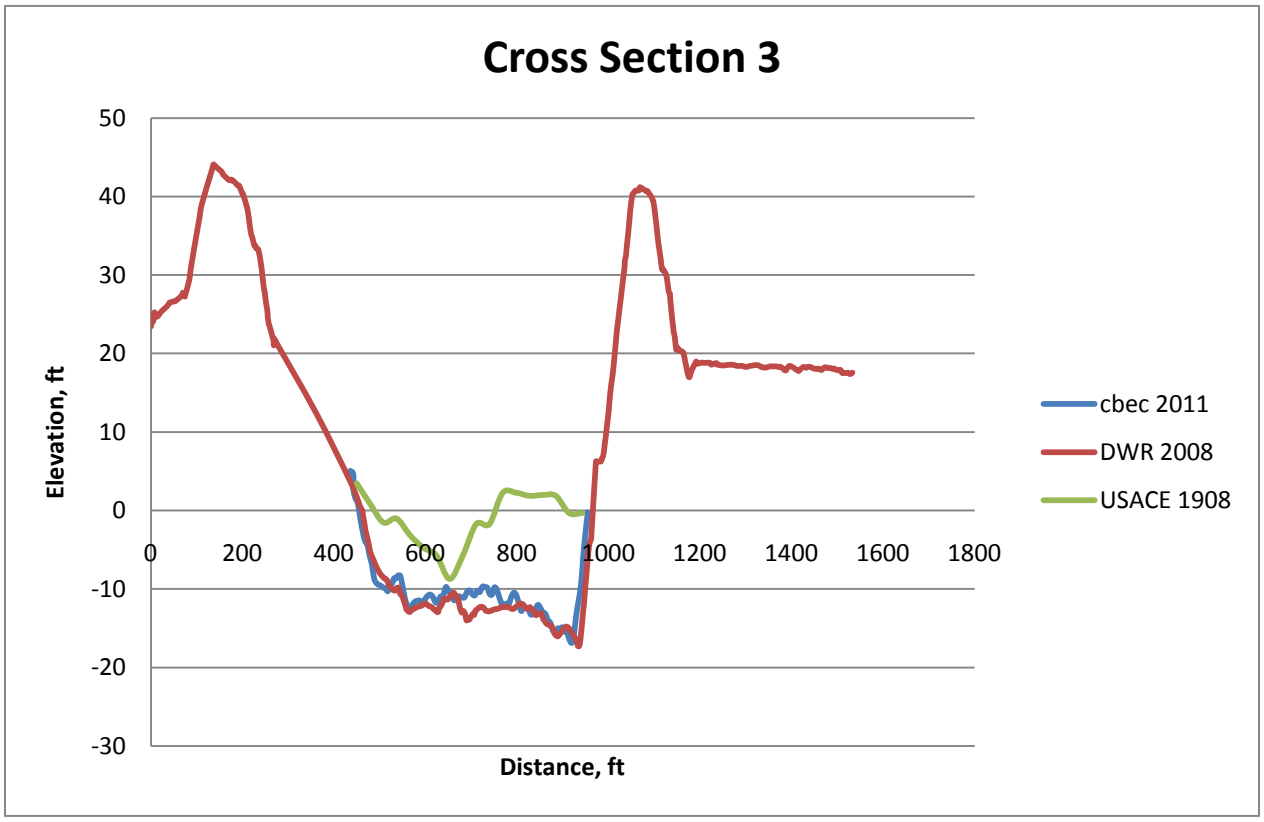
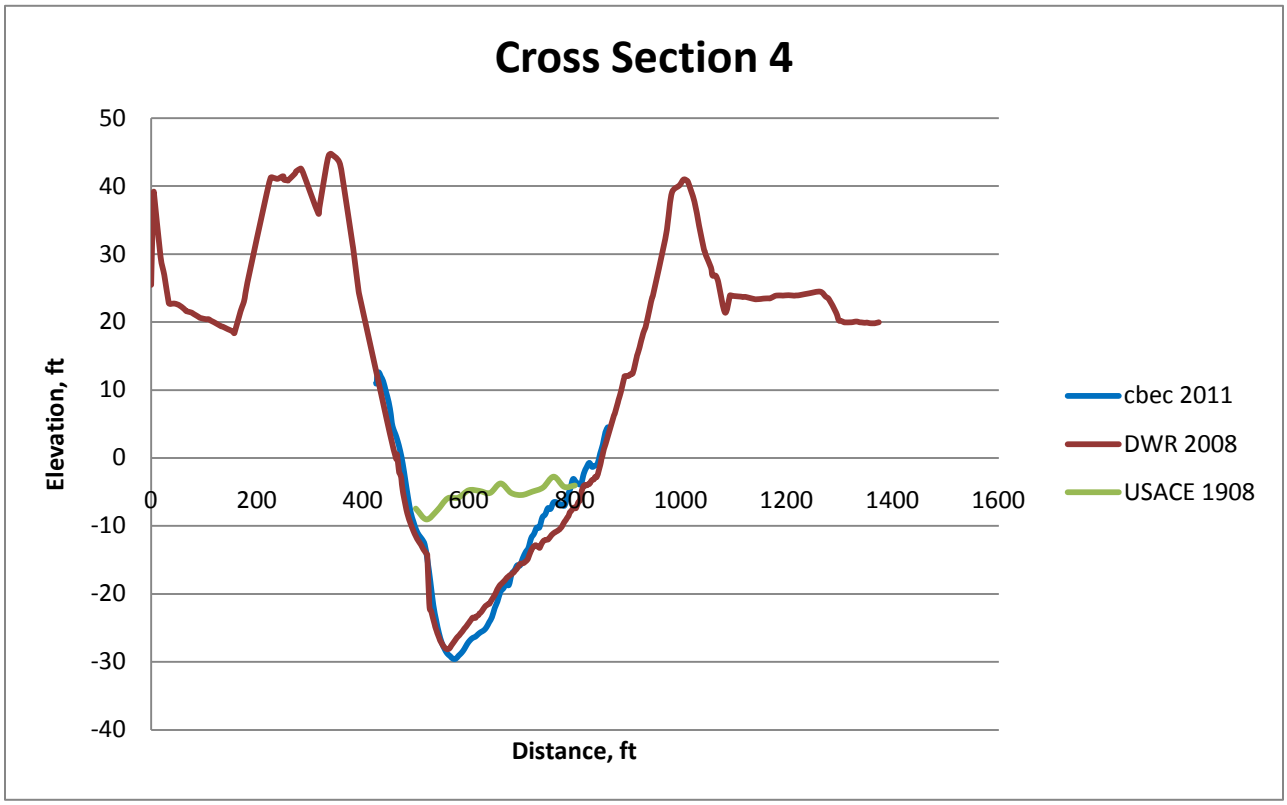
5/13/2011





Notes: Veridical datum referenced NAVD 88

Historic and Current Preliminary Geomorphic Assessment- Southport EIP

Sacramento River Cross Sectional Analysis

Project No. 11-1003	Created By: LA	Appendix A-2

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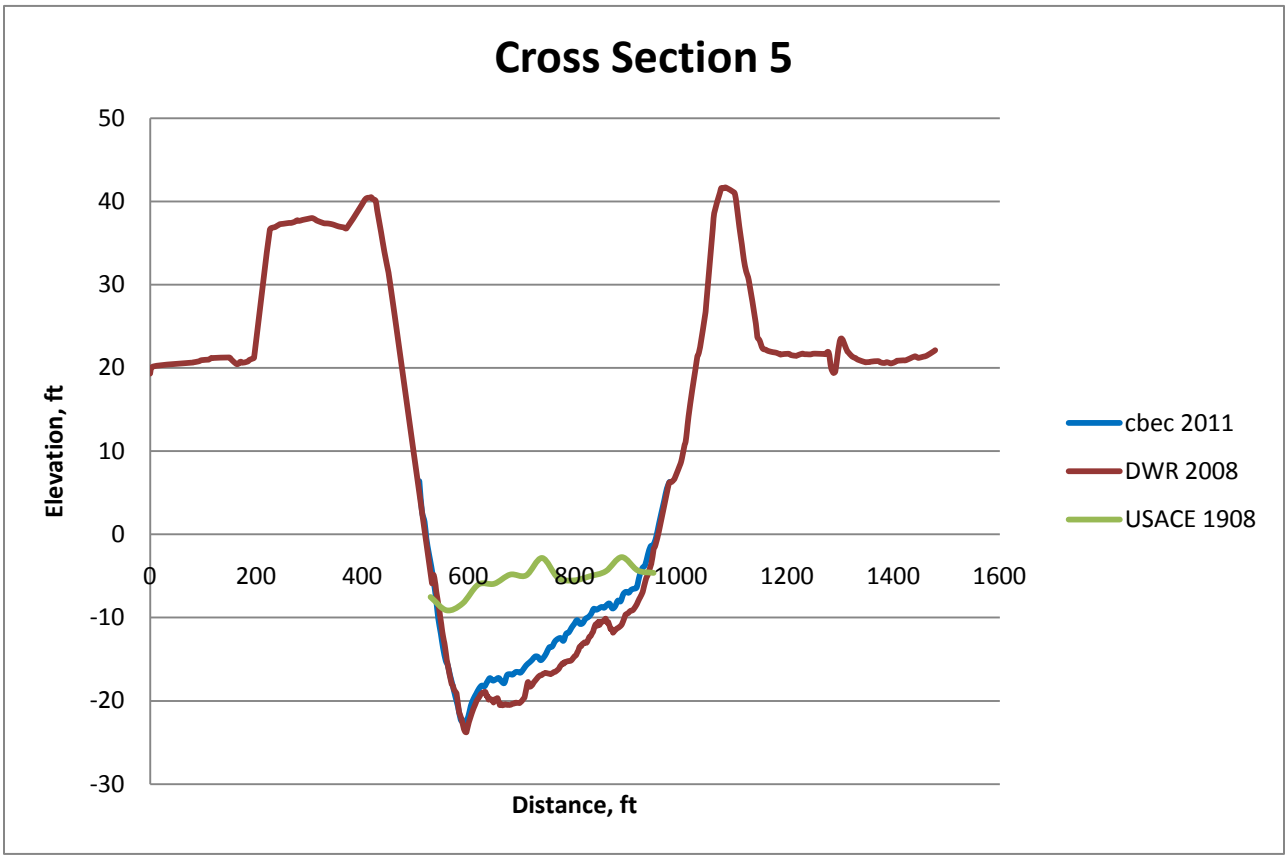

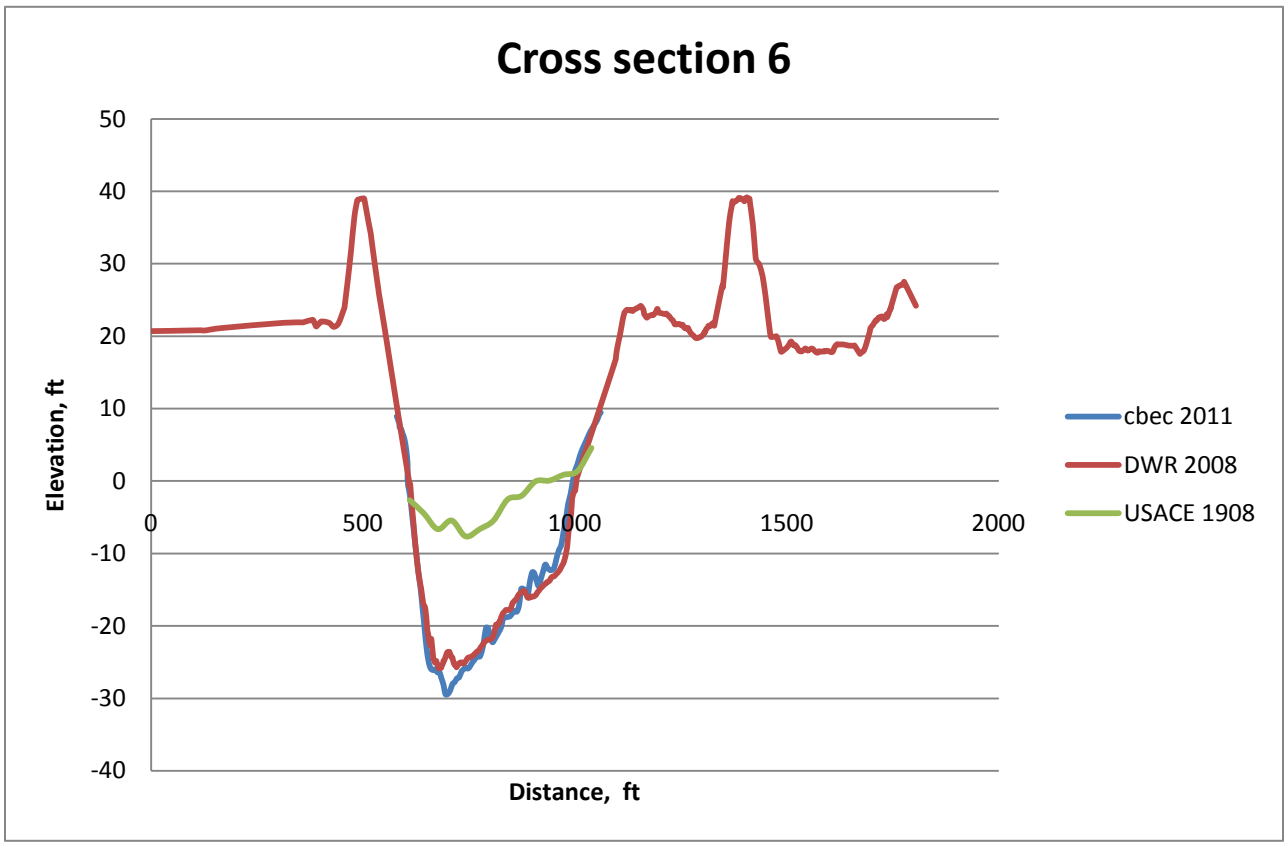

Notes: Veridical datum referenced NAVD 88

Historic and Current Preliminary Geomorphic Assessment- Southport EIP

Sacramento River Cross Sectional Analysis

Project No. 11-1003	Created By: LA	Appendix A-3

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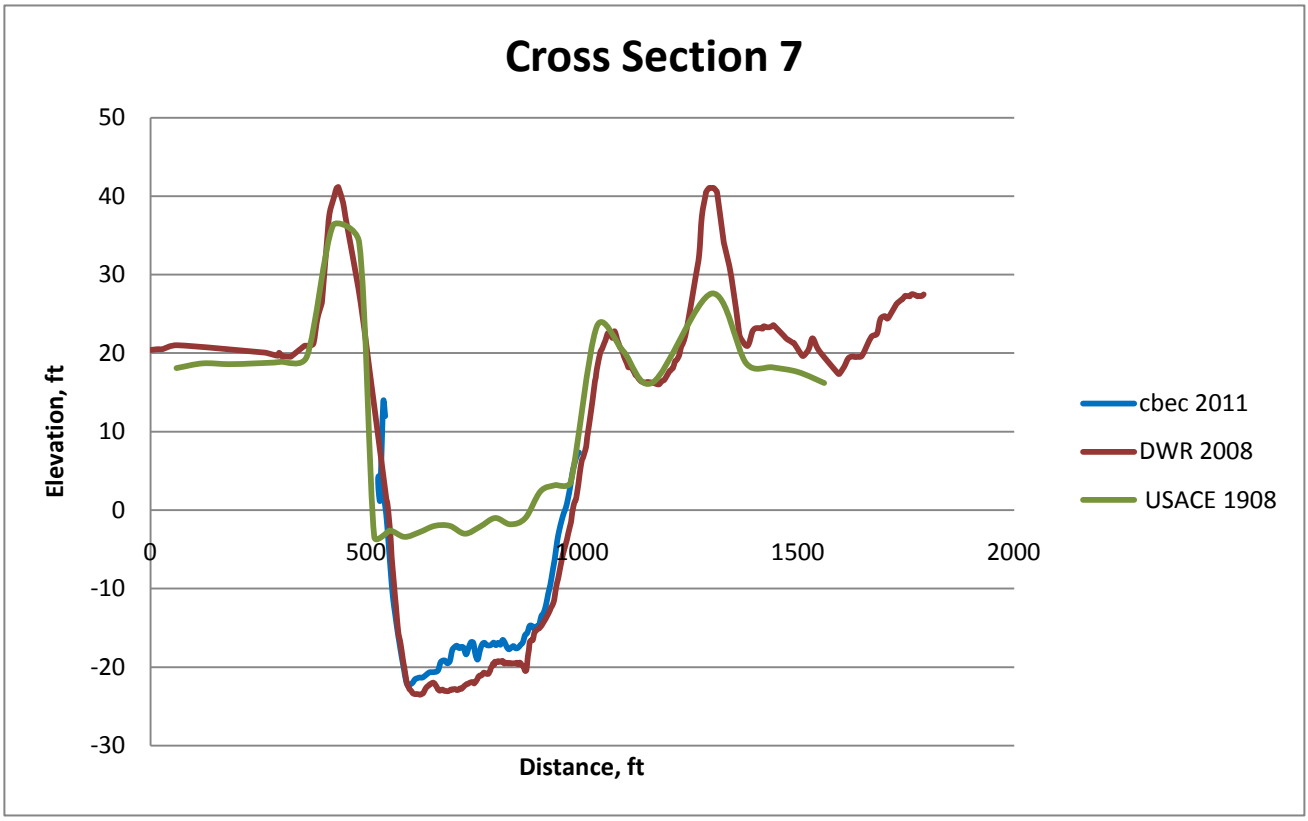

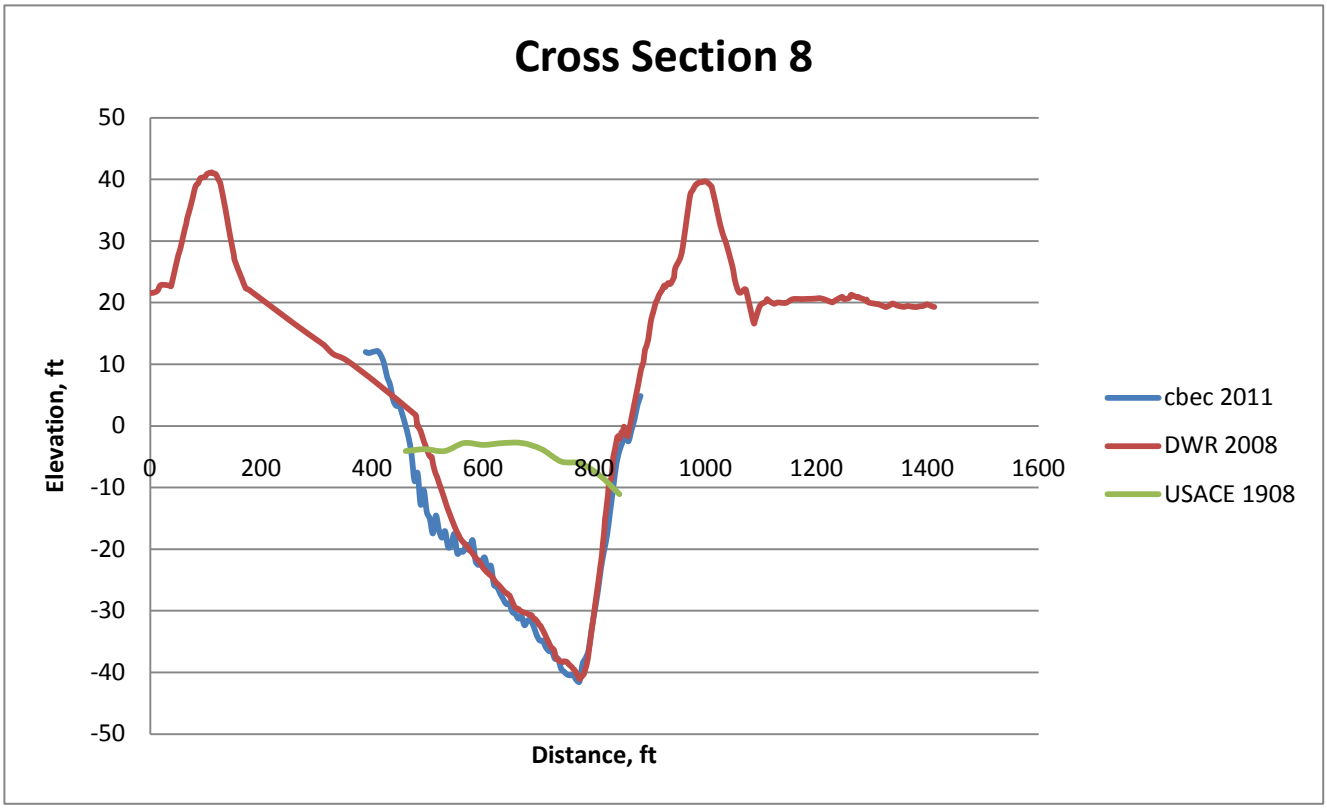

Notes: Veridical datum referenced NAVD 88

Historic and Current Preliminary Geomorphic Assessment- Southport EIP

Sacramento River Cross Sectional Analysis

Project No. 11-1003	Created By: LA	Appendix A-4

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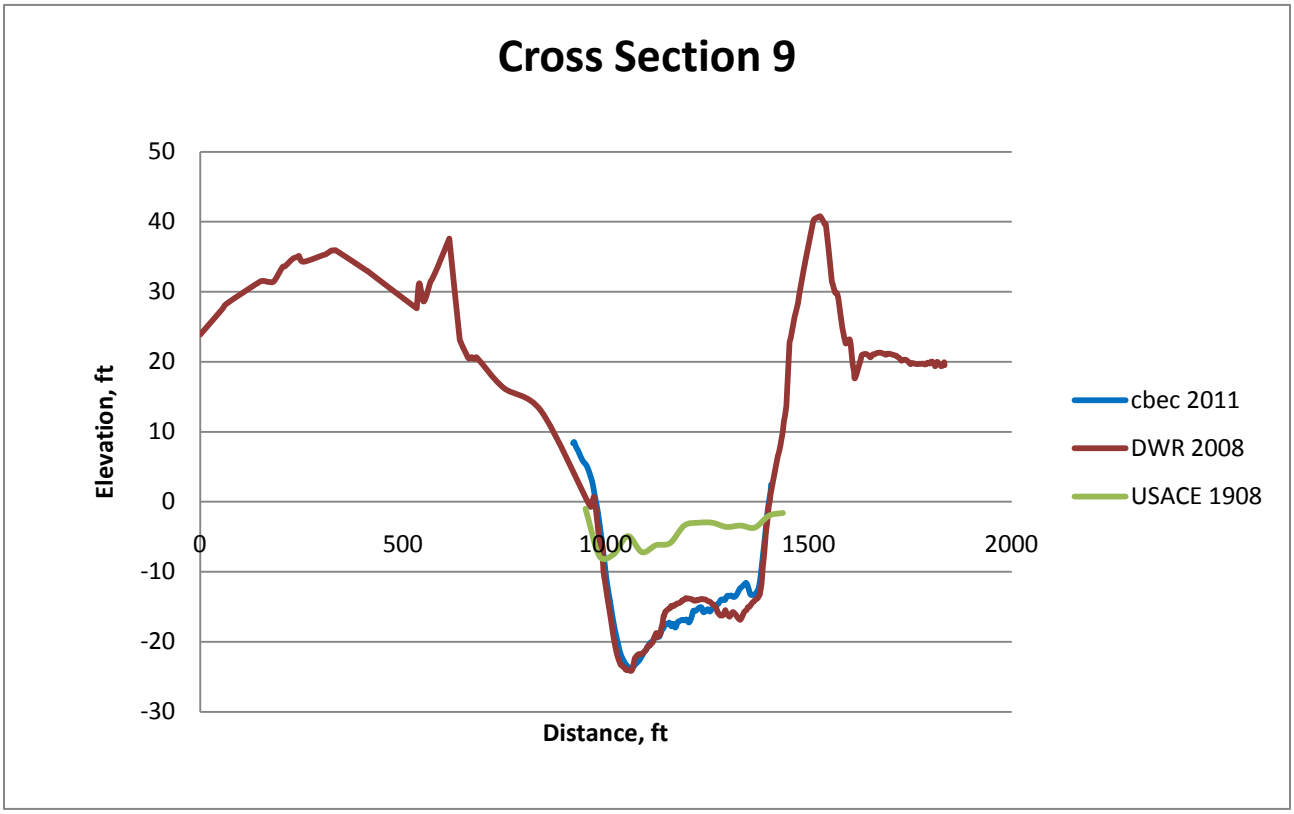

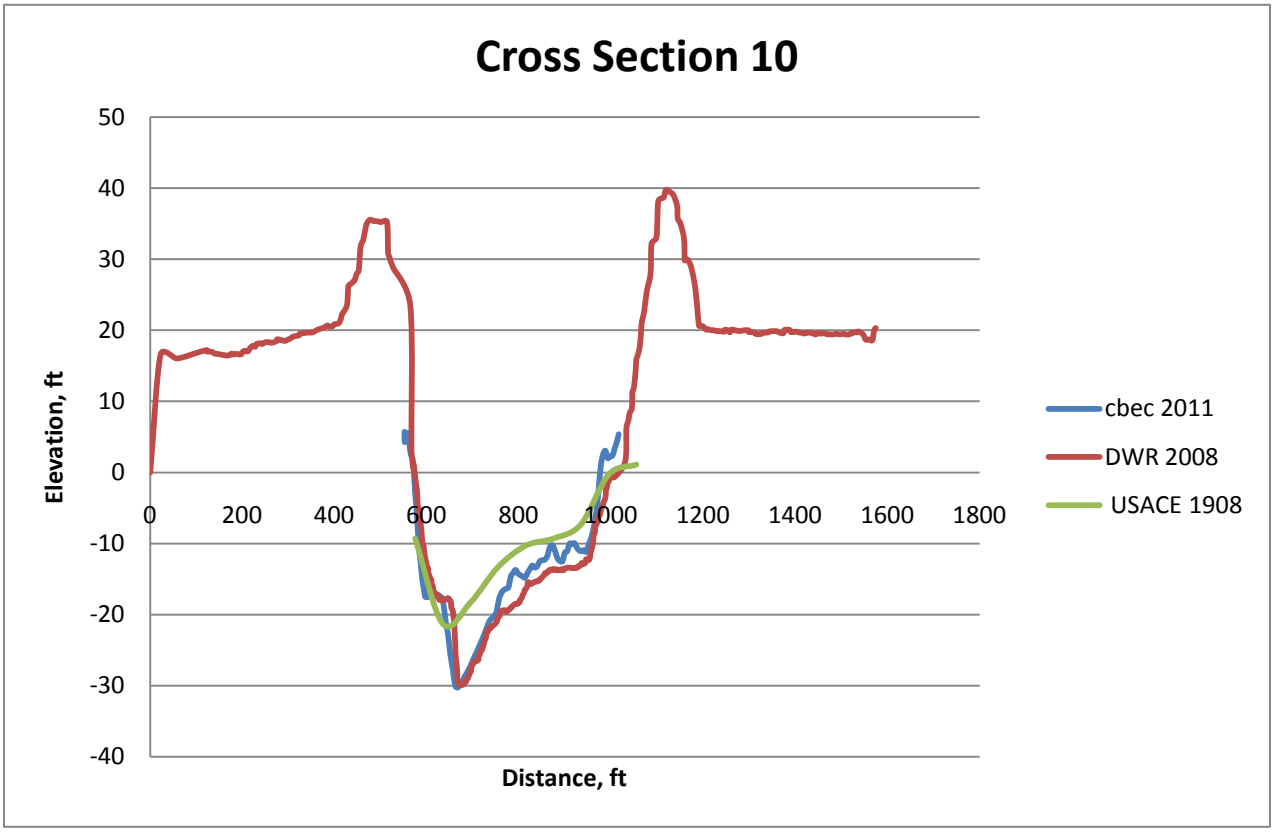

Notes: Veridical datum referenced NAVD 88

Historic and Current Preliminary Geomorphic Assessment- Southport EIP

Sacramento River Cross Sectional Analysis

Project No. 11-1003	Created By: LA	Appendix A-5

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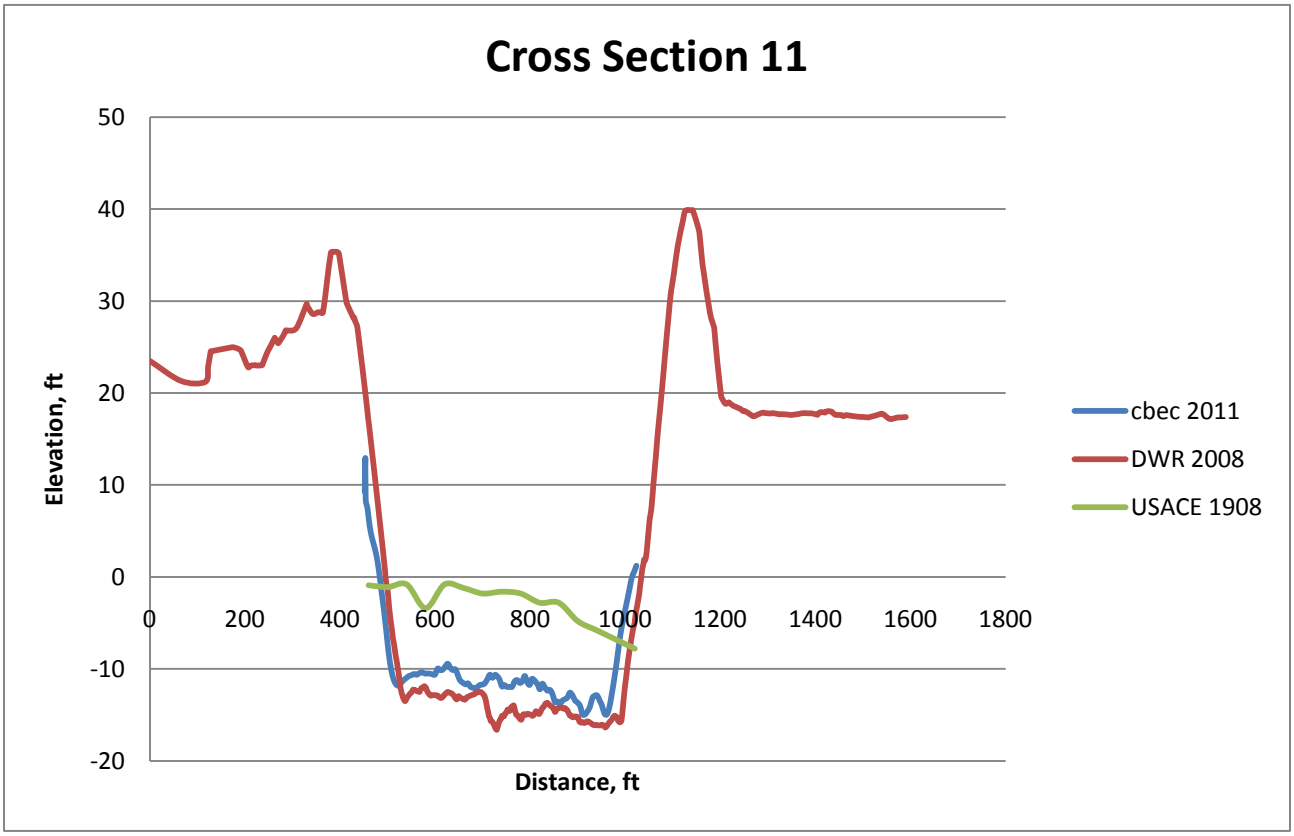

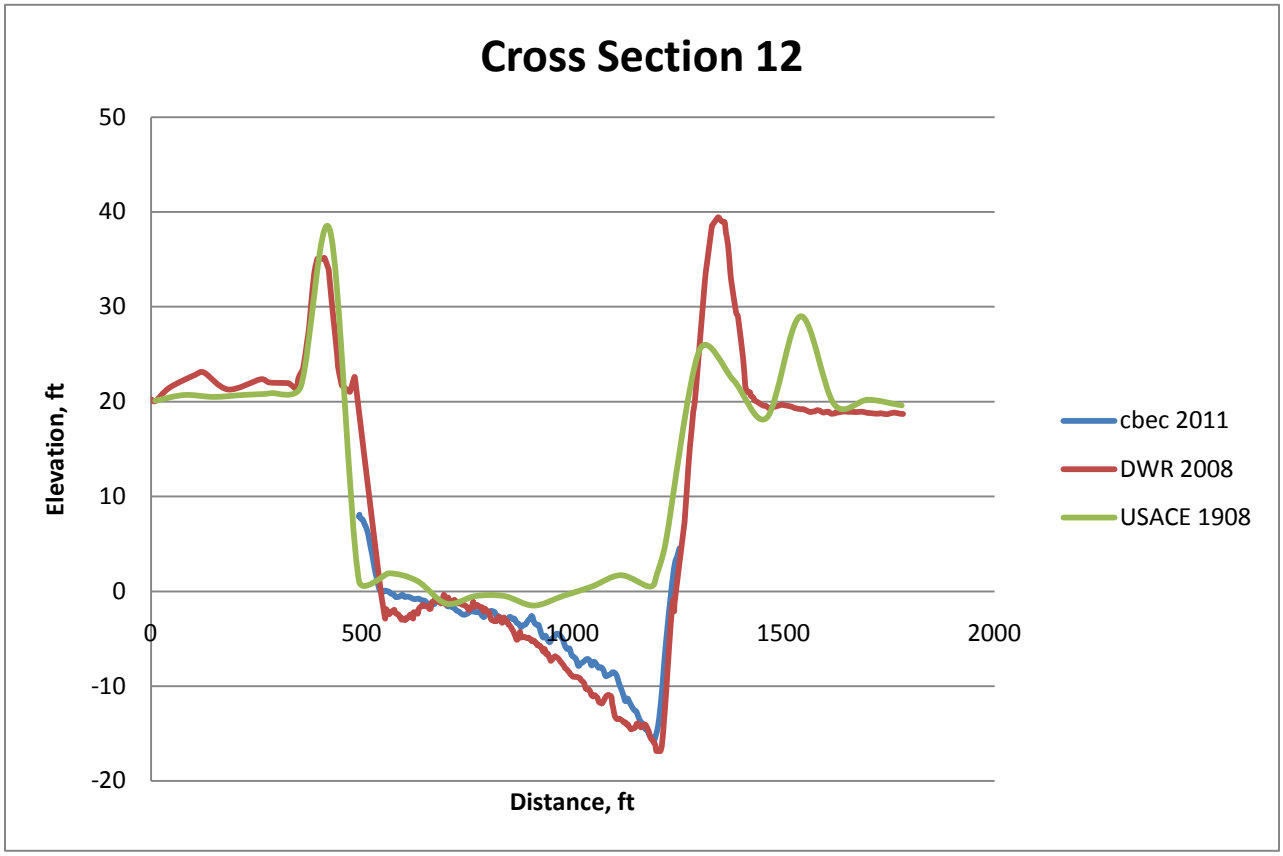

Notes: Veridical datum referenced NAVD 88

Historic and Current Preliminary Geomorphic Assessment- Southport EIP

Sacramento River Cross Sectional Analysis

Project No. 11-1003	Created By: LA	Appendix A-6

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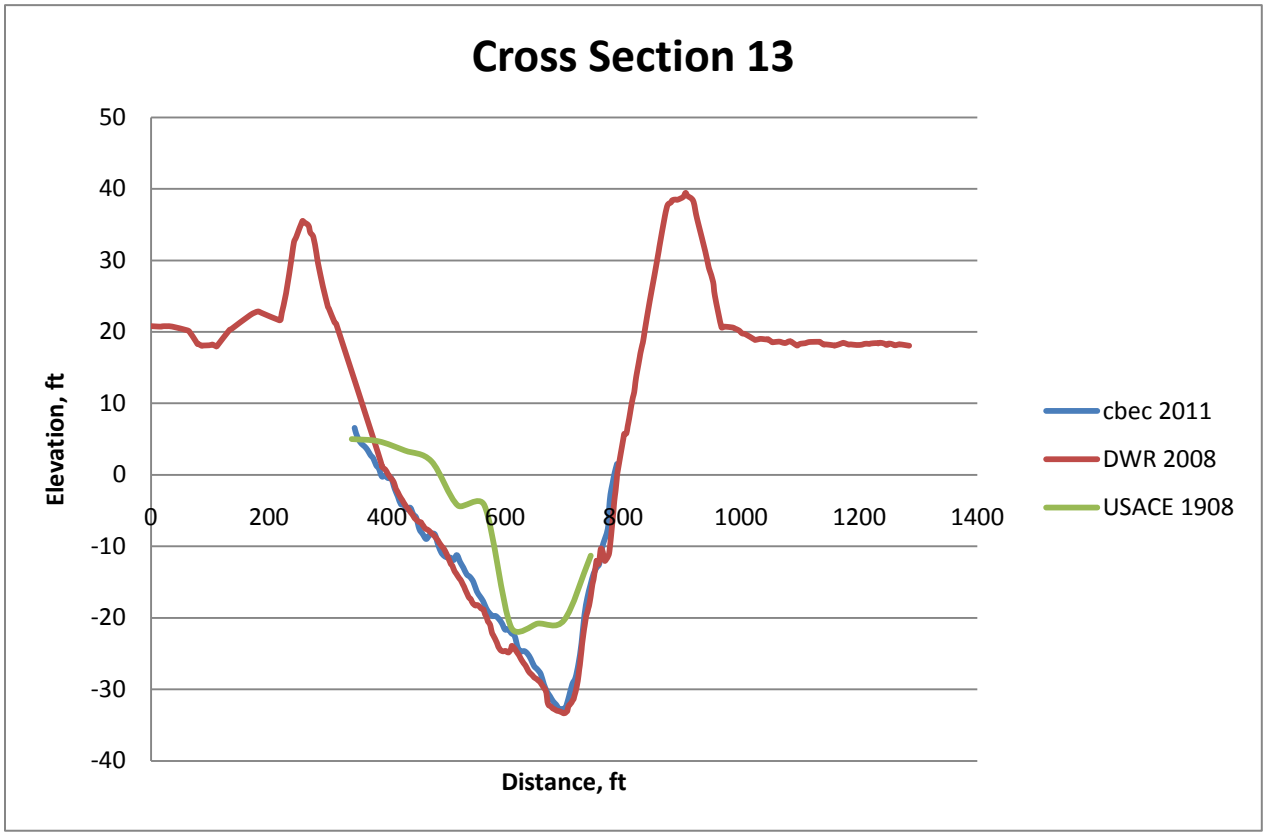
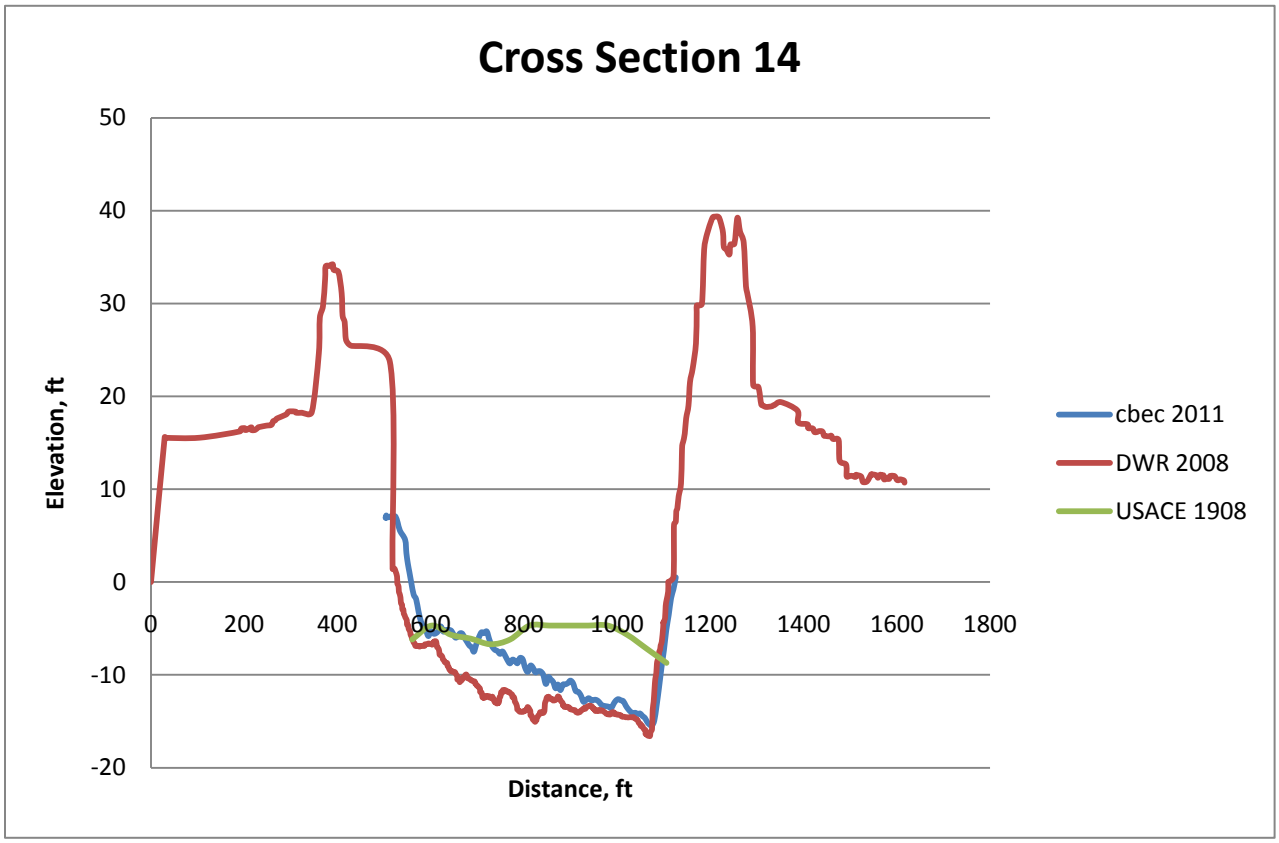
5/13/2011





Notes: Veridical datum referenced NAVD 88

Historic and Current Preliminary Geomorphic Assessment- Southport EIP

Sacramento River Cross Sectional Analysis

Project No. 11-1003	Created By: LA	Appendix A-7

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5/13/2011

APPENDIX B – INTERIM DATA COLLECTION MEMORANDUM

MEMORANDUM

Date:	05/02/11
To:	Michael Vecchio (HDR Engineering)
From:	John Stofleth, M.S., EIT, Chris Bowles, Ph.D., P.E., cbec inc., eco engineering
Project:	10-1043 – West Sacramento Southport EIP Task Order 1
Subject:	Preliminary Hydraulic and Sediment Transport Data Collection

Introduction

cbec, inc., eco engineering (cbec) has collected water level data, measured flows, and measured suspended and bedload sediment transport during geomorphically and ecologically significant events on the Sacramento River during the 2010-2011 flood season.

Water Level Monitoring

cbec staff deployed 3 stage (water level) recorders (pressure transducers) within the project reach (RM 57.1, 55.6, 52) to continuously measure water level data at 15 minute intervals. Figure 1 displays the locations of the deployed stage recorders. Note that the stage recorder at RM 55.6 failed shortly after installation and no useful data was generated at this location. The stage recorders, manufactured by Solinst, model 3001 Gold, are of the non-vented type. Therefore, a barometric recorder was also deployed. The hydraulic pressure measured by the recorders was post-processed using measured barometric pressure to provide a depth of water above the recorder. The stage recorders were deployed on 12/15/2011 and remain in place collecting data to date. The recorders were surveyed to the NAVD 88 vertical datum and were last downloaded on 02/25/11. Figure 2 displays the data collected during this period. Note that a gap existed that is as a result of the water level dropping below the stage recorder. However, the data not captured is not critical to future studies since the corresponding stages occurred during a period of lower flow, not critical to geomorphic processes or floodplain inundation. Data will be downloaded again this spring after water levels recede so that equipment can be accessed.

A flood frequency analysis of flow data at the Freeport gauge on the Sacramento River, downstream of the Southport EIP project reach, indicated that the flow at the peak of the December 2010 event shown by Figure 2, corresponded approximately to a 2-year return interval flow, as shown by Figure 3. Examination of this peak water surface elevation, which ranged from 23.8 at Stage 1 (upstream), to 21.5 at Stage 2 (downstream), and comparison with typical floodplain elevations through the potential area of the levee setback alignments (CMA 2 and 4), indicated that under a levee setback condition, the exposed floodplain would be inundated to a depth of approximately 2 to 6 feet. This has significant

implications for the proposed design of floodplain enhancement and ecosystem mitigation of the setback area.

Water level data collected through this and ongoing efforts will be valuable for calibration and validation of future hydrodynamic modeling, particularly the 2-dimensional modeling that will be developed for ecological and geomorphic design purposes.

Velocity and Flow Measurements

cbec staff measured flows in the Sacramento River using an Acoustic Doppler Current Profiler (ADCP) (RDI RiverRay 600 kHz) at two transects (RM 58.6, 50.4) during ecologically and geomorphically significant flow events in December and January 2010, using methods prescribed by the USGS (see appendix - Mueller and Wagner 2009). Figure 1 displays the locations where the measurements were made. The results of these flow measurements are summarized in Table 1. ADCP velocity cross section contour plots are shown by Figure 4, 5 and 6. Velocities in these sections ranged from approximately 0.2 to 6.5 ft/s during the events measured. cbec staff were unable to conduct measurements at both locations on 12/23/11 due to the large quantity of floating debris (wheat stubble) which clogged the field vessel motor intake.

Flow and velocity collected through this and ongoing efforts will be valuable for calibration and validation of future hydrodynamic and sediment transport modeling, particularly the 2-dimensional modeling that will be developed for ecological and geomorphic design purposes.

Sediment Load Measurements

cbec staff measured bed and suspended sediment loads in the Sacramento River at two transects through the project reach (RM 58.6, 50.4) during ecologically and geomorphically significant flow events using methods prescribed by the USGS (Edwards and Glysson 1999). Figure 1 displays the locations where the measurements were made. Figure 7 shows photographs of the equipment used to measure bed and suspended sediment loads.

Bed load measurements were taken using a Helley Smith Model 8035 bedload sampler. 20 bedload samples were taken at each transect on 12/23/11 and 01/5/11 per USGS guidelines. Samples were analyzed for total dry weight and the particle size distribution by Blackburn Consulting. For additional information on sampling techniques and the method for calculating bedload please refer to the appendix (Edwards and Glysson 1999).

Depth integrated suspended sediment samples were taken using a DH 2A sampler. 10 samples were taken at each transect per USGS guidelines (Edwards and Glysson 1999). Samples were analyzed by Cooper Laboratories for total suspended solids (TSS – mg/L). Using the average concentration of suspend sediment (TSS – mg/L) and the measured discharge at each transect, an instantaneous load of suspended sediment was calculated. A daily load (tons/day) was calculated assuming the measured discharge would be sustained for a 24 hour period.

The results of the bed and suspended load measurements are summarized in Table 1. The particle size distributions of the bedload measurements are included in Figures 8, 9 and 10. cbec staff were unable to conduct measurements at both locations during on 12/23/11 due to the large quantity of floating debris (wheat stubble) which clogged the field vessel motor intake.

Table 1: Summary of measured discharge (Q), suspended load (Qss) and bedload (Qbl).

Date	River Mile (RM)	Q (cfs)	RI (cfs)	Min Velocity (ft/s)	Max Velocity (ft/s)	Q_{bl} (tons/day)	TSS (mg/L)	Q_{ss} (tons/day)
12/23/2010	58.6	73,670	2-yr	0.2	6.4	6,977	84	16,618
1/5/2011	50.4	58,275	1.5	0.2	6.2	1,501	51	7,990
1/5/2011	58.6	57,847	1.5	0.1	5.6	1,748	49	7,682

Bed and suspended sediment loads collected through this and ongoing efforts will be valuable for calibration and validation of future hydrodynamic and sediment transport modeling, particularly the 2-dimensional modeling that will be developed for ecological and geomorphic design purposes.

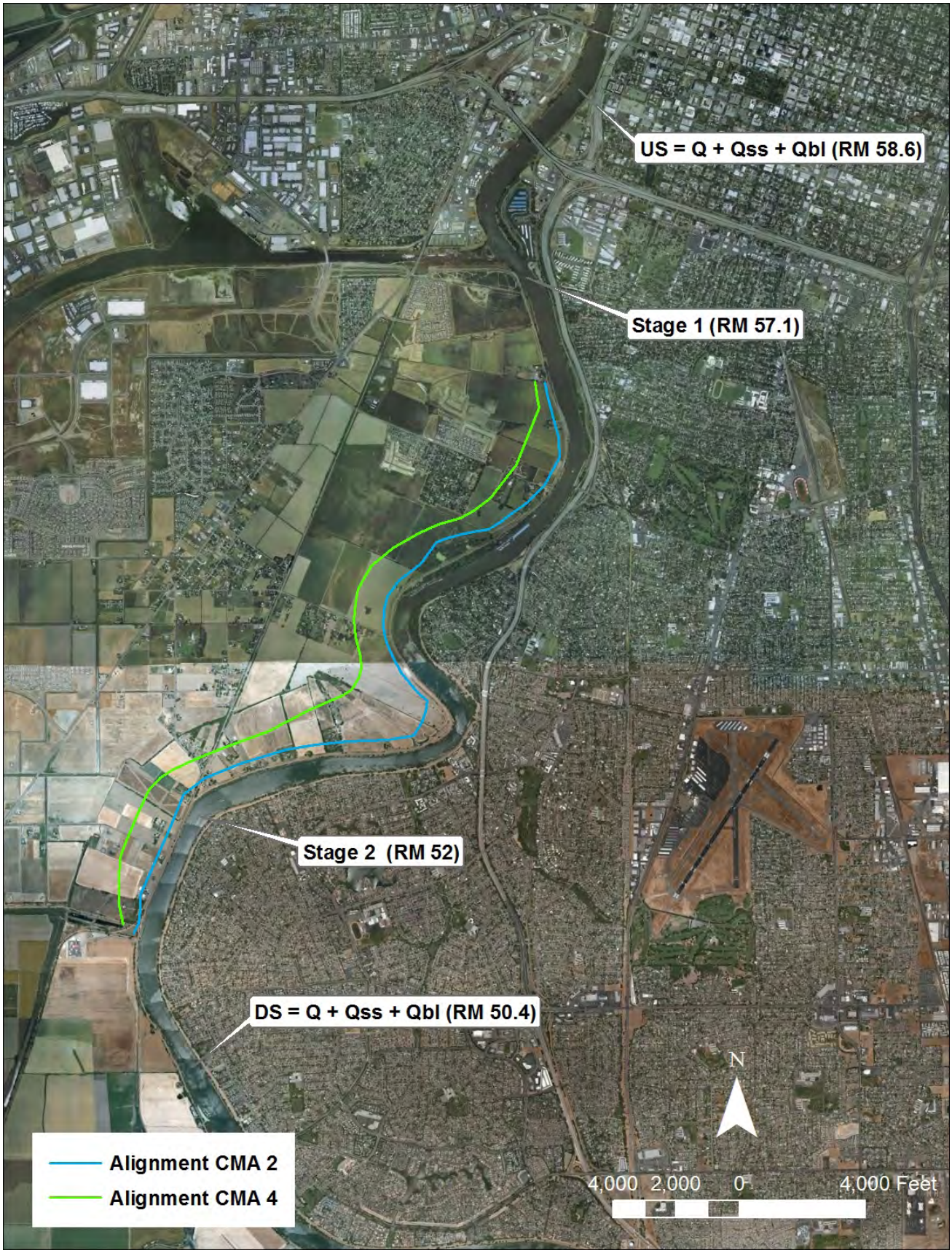
Conclusions and Recommendations

The results of the field data collection effort initiated through this task indicate that high quality data were collected that will be valuable for future project feasibility and design stages. We highly recommend that the water level (stage) recorders continue to be deployed through project construction and monitoring. In addition, further ADCP measurements should be taken in the main channel of the Sacramento River to provide additional baseline data, and on the floodplain after construction of the levee setback alignment (if it is implemented) for verification purposes. Finally, the bed and suspended sediment load measurements taken through this effort represent just an initial “snapshot in time” and additional data should be collected through the 2011-12 winter season for project design purposes.

References

Edwards T.K. and Glysson G.D., 1999. Field methods for measurement of fluvial sediment**.** USGS—TWRI Book 3, Chapter C2. 1999.

Mueller, D.S., and Wagner, C.R., 2009, Measuring discharge with acoustic Doppler current profilers from a moving boat: U.S. Geological Survey Techniques and Methods 3A–22, 72 p.



Notes: Q = Discharge (cfs)
Qss = Suspended Load
Qbl = Bedload

West Sacramento Southport EIP Task Order 1

Monitoring Locations

Project No. 10-1043	Created By: JS	**Figure 1**

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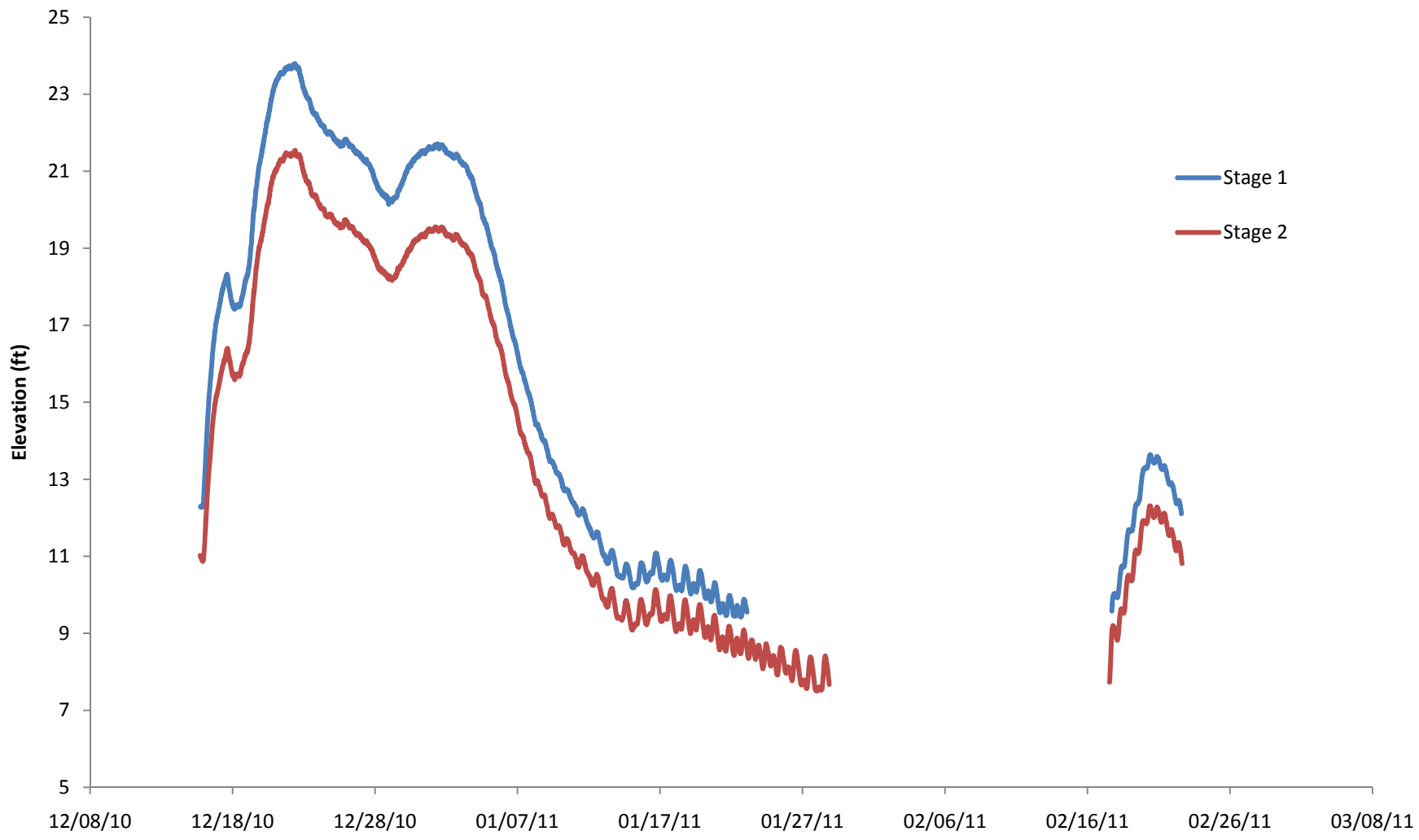
5/2/2011



Notes: Elevation references the NAVD 88 vertical datum. Missing data is a result of the water level dropping below the elevation of stage recorder.

West Sacramento Southport EIP Task Order 1

Measured Stage within Project Reach

Project No. 10-1043	Created By: JS	**Figure 2**

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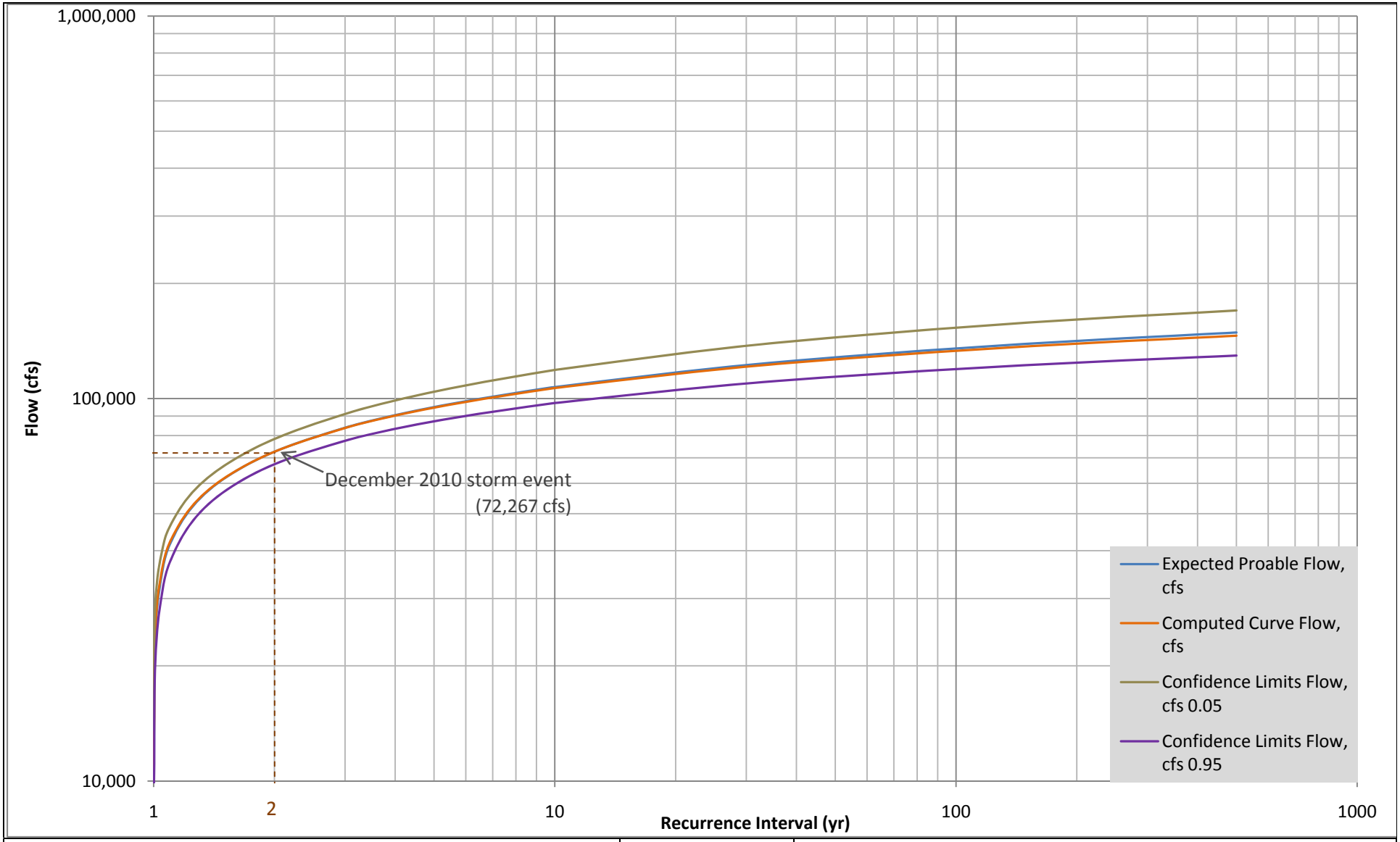
5/2/2011



Notes: Flood frequency analysis for a 2-year event yields an expected probable flow of 72,592cfs. Peak discharge data for December storm event (12/21/2010) was 72,267cfs. Datum NAVD 88

Historic and Current Preliminary Geomorphic Assessment - Southport EIP

December 2010 event stage data

Project No. 11-1003	Created By: LA	**Figure 3**

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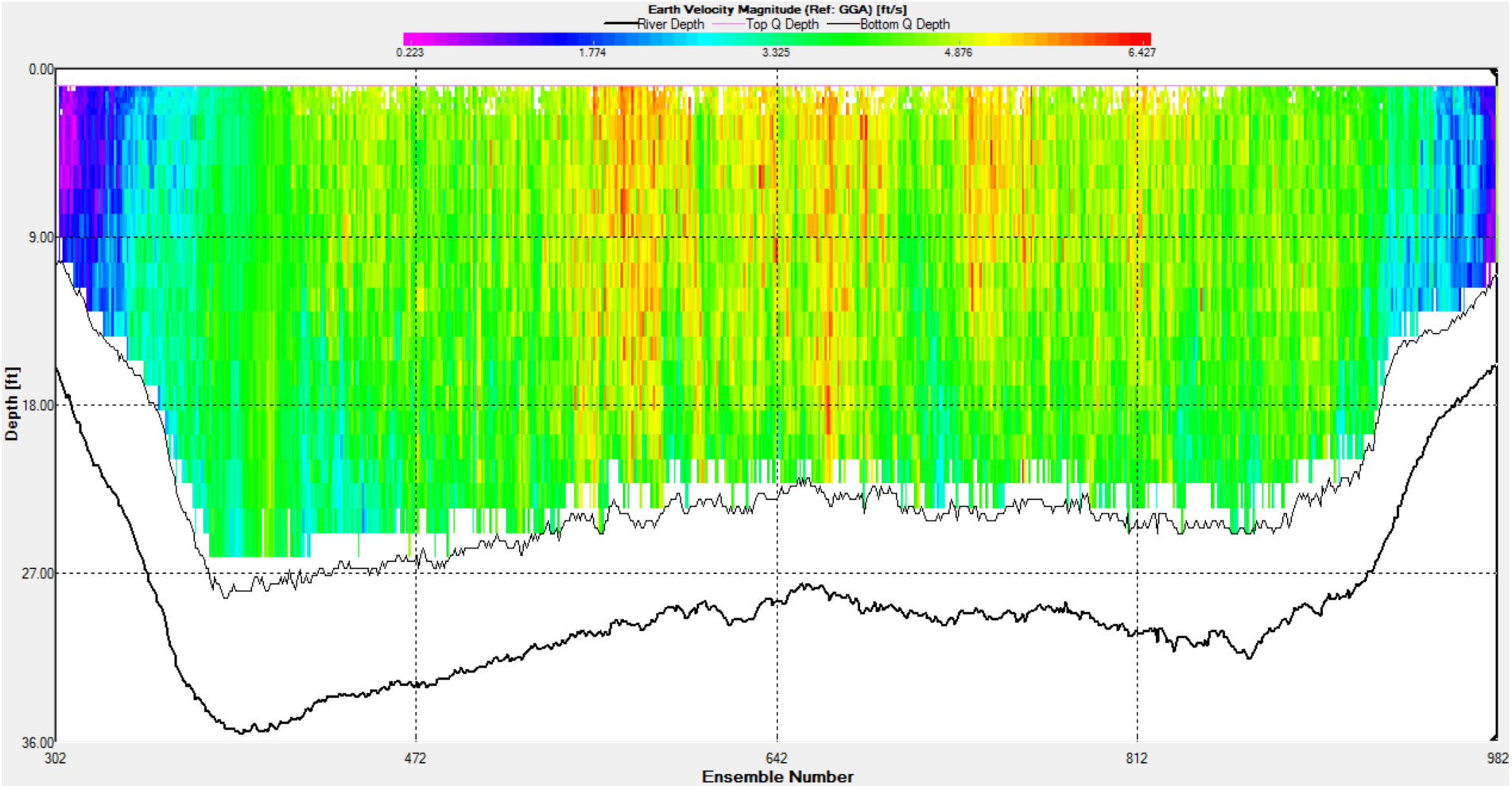
5/2/2011



Notes: Measurement taken at upstream monitoring site.

West Sacramento Southport EIP Task Order 1

ADCP Velocity Magnitude - 12/23/11

Project No. 10-1043	Created By: JS	**Figure 4**

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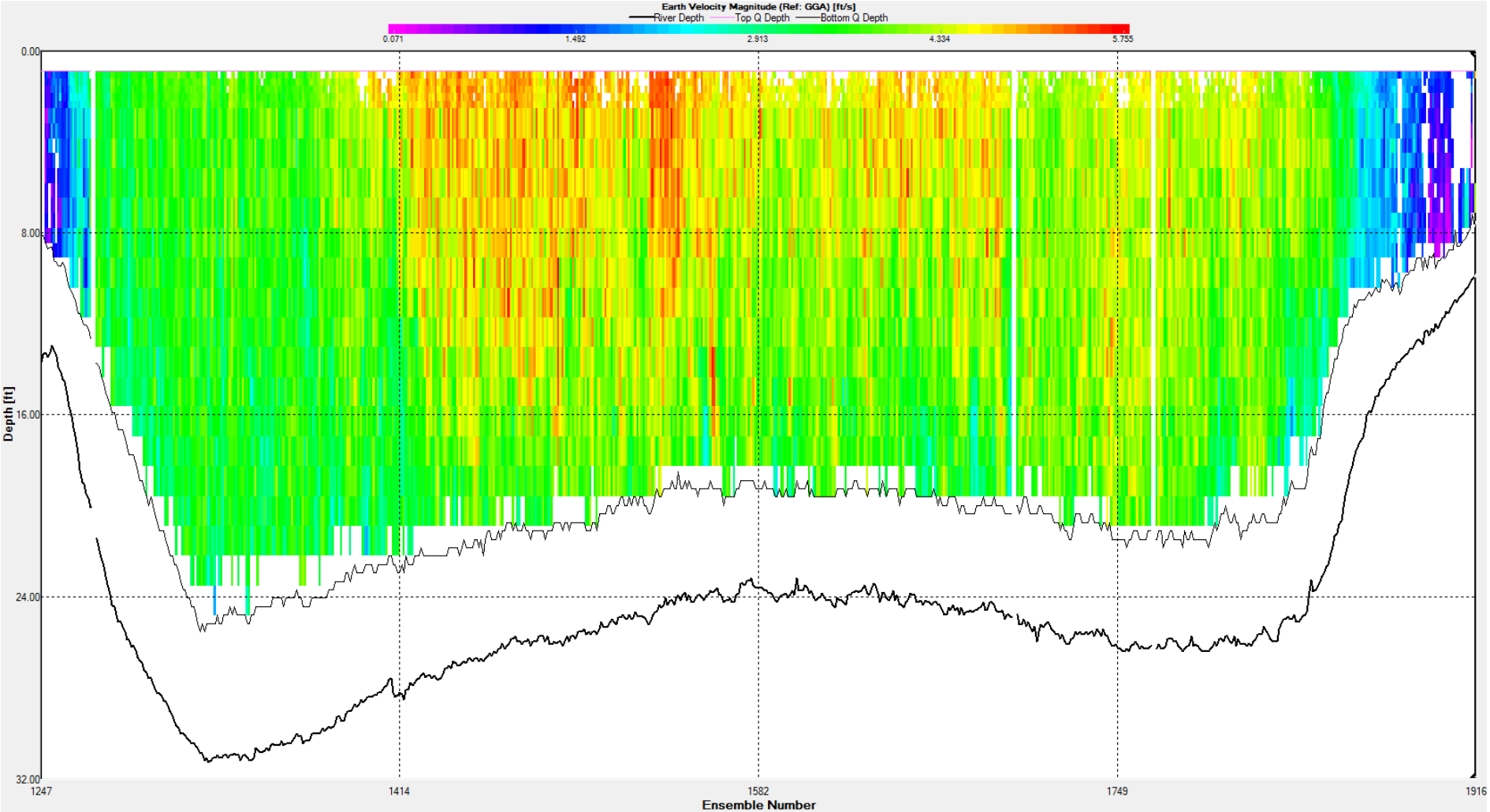
5/2/2011



Notes: Measurement taken at upstream monitoring site.

West Sacramento Southport EIP Task Order 1

ADCP Velocity Magnitude - 01/05/11

Project No. 10-1043	Created By: JS	**Figure 5**

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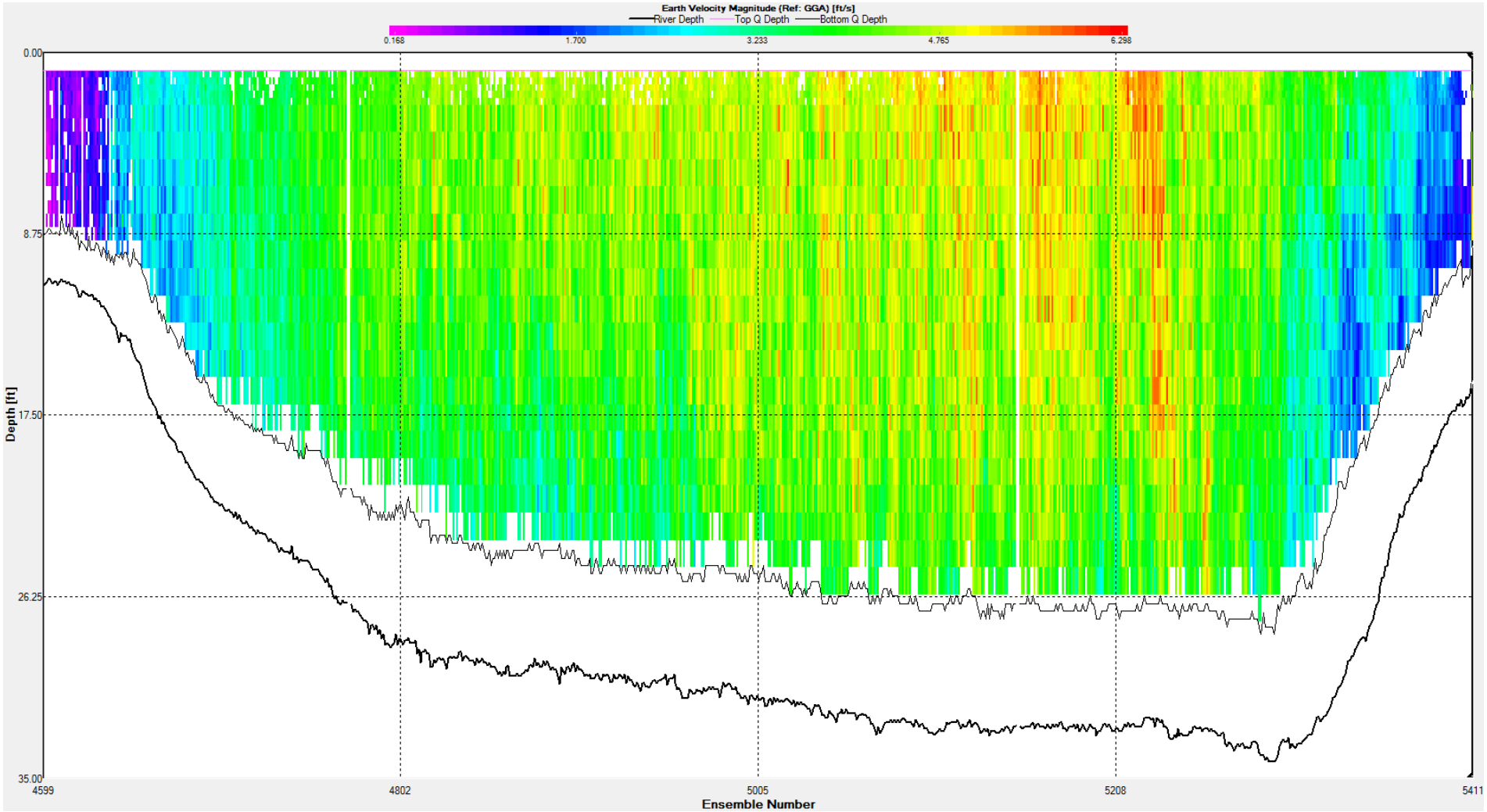
5/2/2011



Notes: Measurement taken at downstream monitoring site.

West Sacramento Southport EIP Task Order 1

ADCP Velocity Magnitude - 01/05/11

Project No. 10-1043	Created By: JS	**Figure 6**

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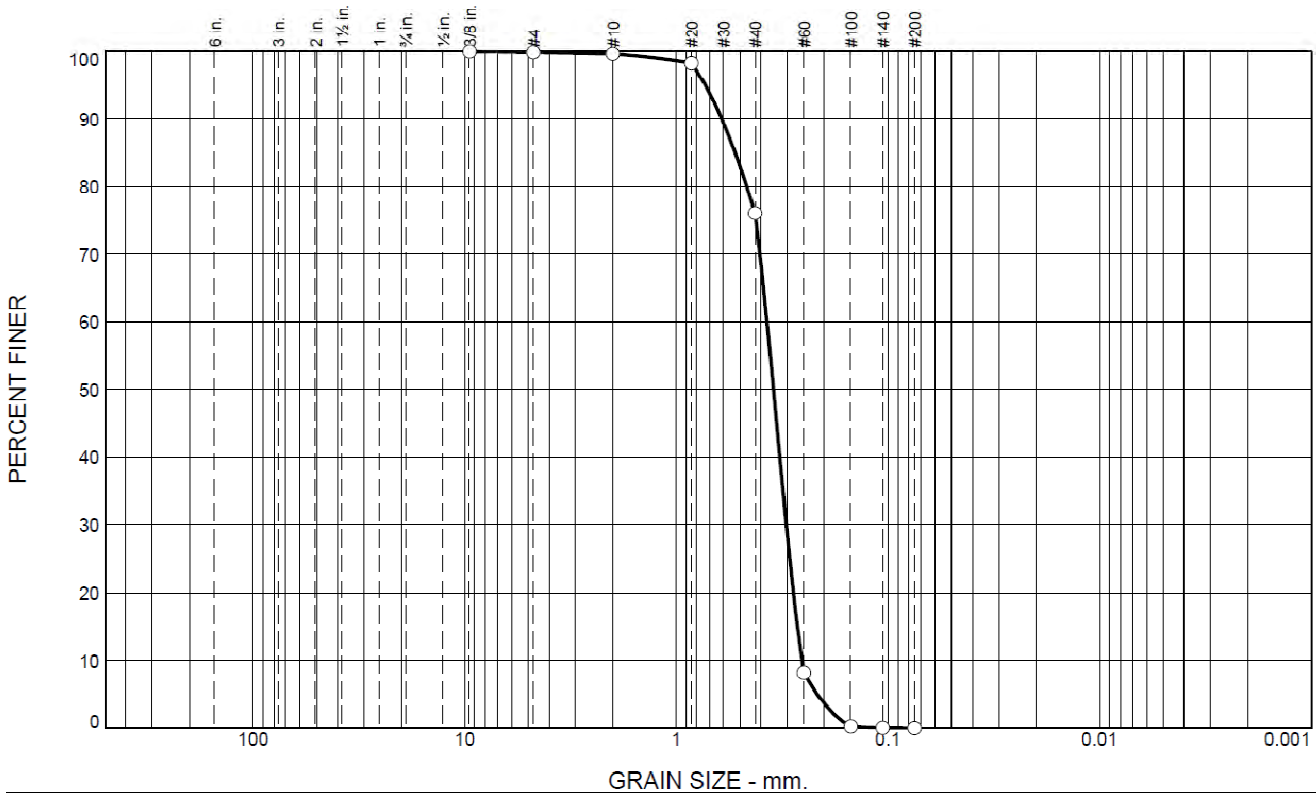
5/2/2011

Notes: Above: DH 2A suspended sediment sampler. Below: Helly Smith bedload sampler	cbec eco engineering	*West Sacramento Southport EIP Task Order 1* **Bedload and Suspended Load Sampling Equipment**		
		Project No. 10-1043	Created By: JS	**Figure 7**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.3	23.5	76.1	0.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	99.9		
#10	99.6		
#20	98.3		
#40	76.1		
#60	8.2		
#100	0.3		
#140	0.1		
#200	0.0		

* (no specification provided)

Soil Description

Poorly-graded SAND, olive brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.6103 D_{85}= 0.5275 D_{60}= 0.3735
D_{50}= 0.3481 D_{30}= 0.3028 D_{15}= 0.2684
D_{10}= 0.2553 C_u= 1.46 C_c= 0.96

Classification

USCS= SP AASHTO=

Remarks

Shells and organics on No. 4 sieve
Organics, some coarse sand on No. 10 sieve
Some organics, sand on No. 20 sieve

Sample Number: DS-BL

Date: 2-15-11

Notes: Sample collected at downstream monitoring site on 1/5/11.

West Sacramento Southport EIP Task Order 1

Particle Size Distribution – Bedload

Project No. 10-1043 | Created By: JS | **Figure 8**

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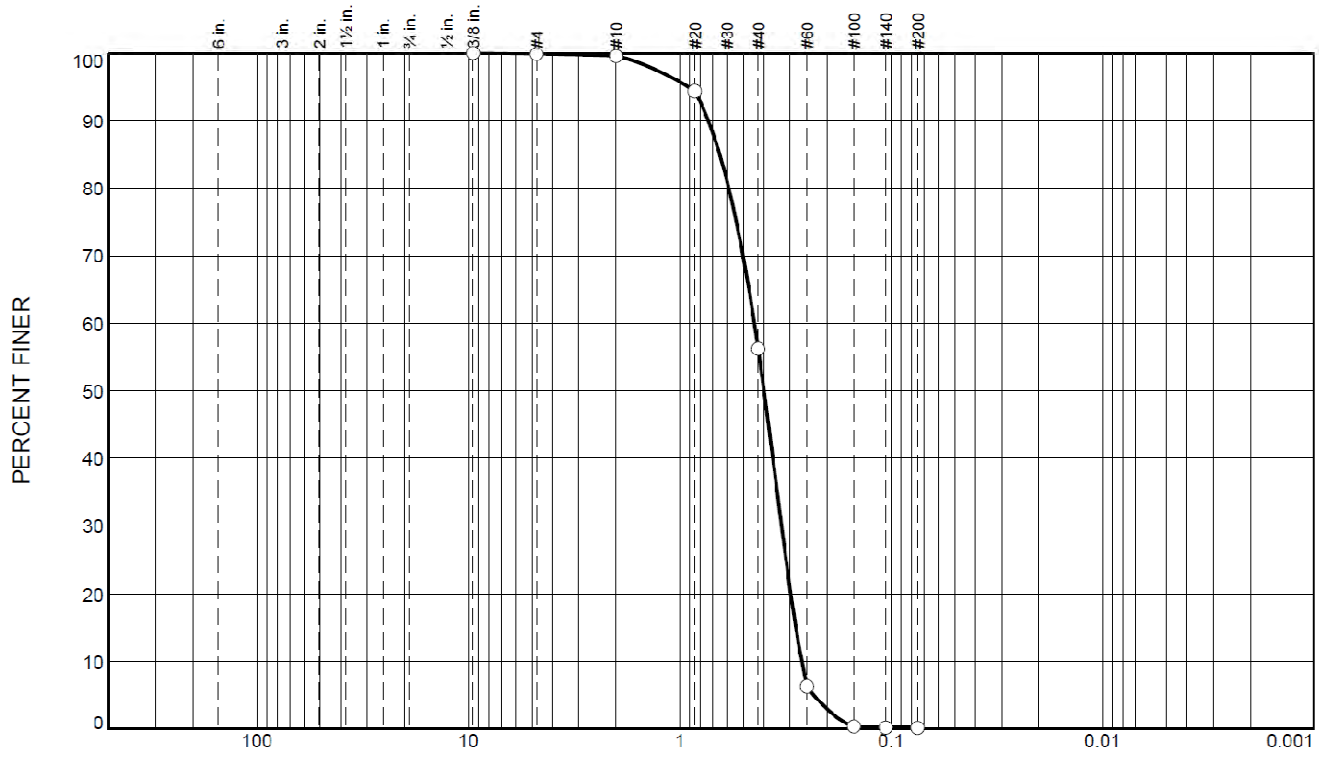
5/2/2011

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.3	43.3	56.0	0.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	99.8		
#10	99.5		
#20	94.4		
#40	56.2		
#60	6.3		
#100	0.4		
#140	0.3		
#200	0.2		

* (no specification provided)

Soil Description

Poorly-graded SAND, olive brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.7317 D_{85}= 0.6462 D_{60}= 0.4430
D_{50}= 0.3991 D_{30}= 0.3301 D_{15}= 0.2824
D_{10}= 0.2648 C_u= 1.67 C_c= 0.93

Classification

USCS= SP AASHTO=

Remarks

Sample Number: US-BL

Date: 2-15-11

Notes: Sample collected at upstream monitoring site on 12/23/10.

West Sacramento Southport EIP Task Order 1

Particle Size Distribution – Bedload

Project No. 10-1043 | Created By: JS | **Figure 9**

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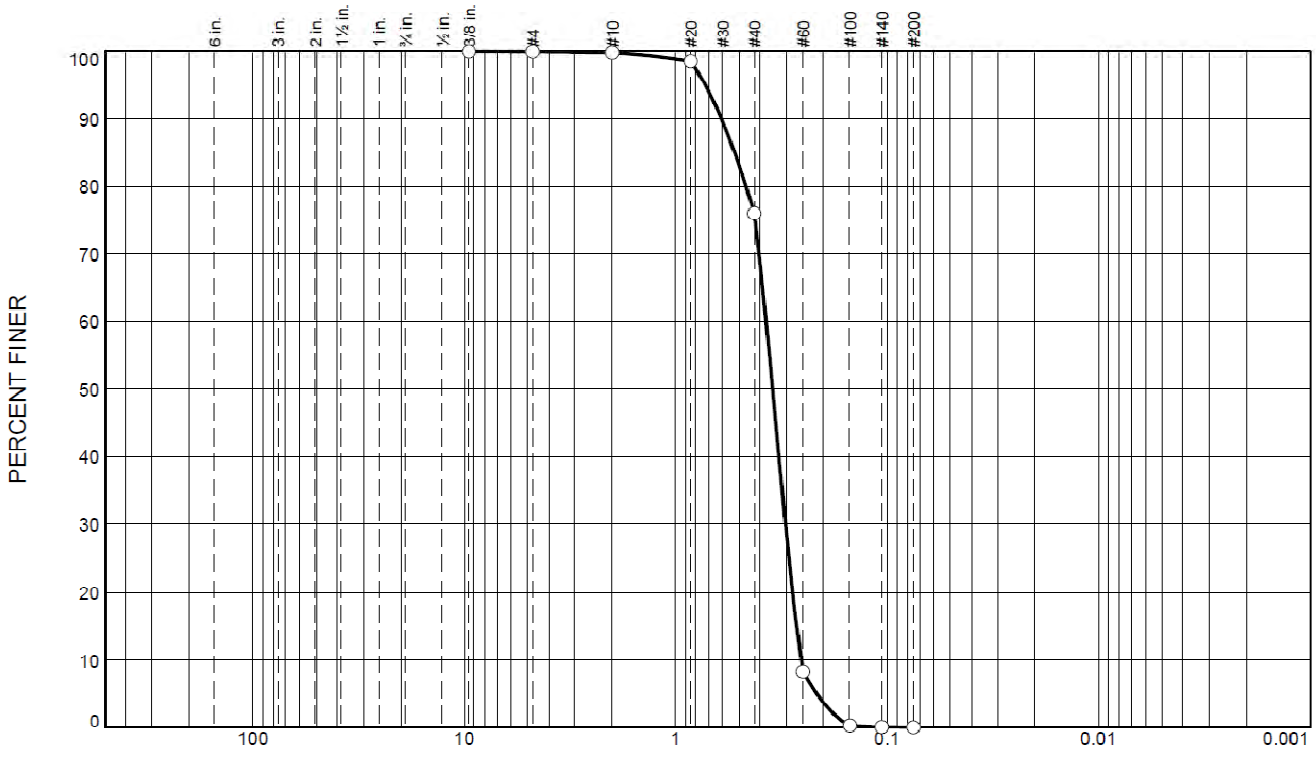
5/2/2011

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	23.8	75.9	0.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	100.0		
#10	99.8		
#20	98.5		
#40	76.0		
#60	8.3		
#100	0.3		
#140	0.1		
#200	0.1		

* (no specification provided)

Soil Description

Poorly-graded SAND, olive brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.6072 D_{85}= 0.5262 D_{60}= 0.3736
D_{50}= 0.3481 D_{30}= 0.3026 D_{15}= 0.2681
D_{10}= 0.2549 C_u= 1.47 C_c= 0.96

Classification

USCS= SP AASHTO=

Remarks

All organics (0.22g) retained on the No. 4 sieve

Sample Number: US-BL2

Date: 2-15-11

Notes: Sample collected at upstream monitoring site on 1/5/10.

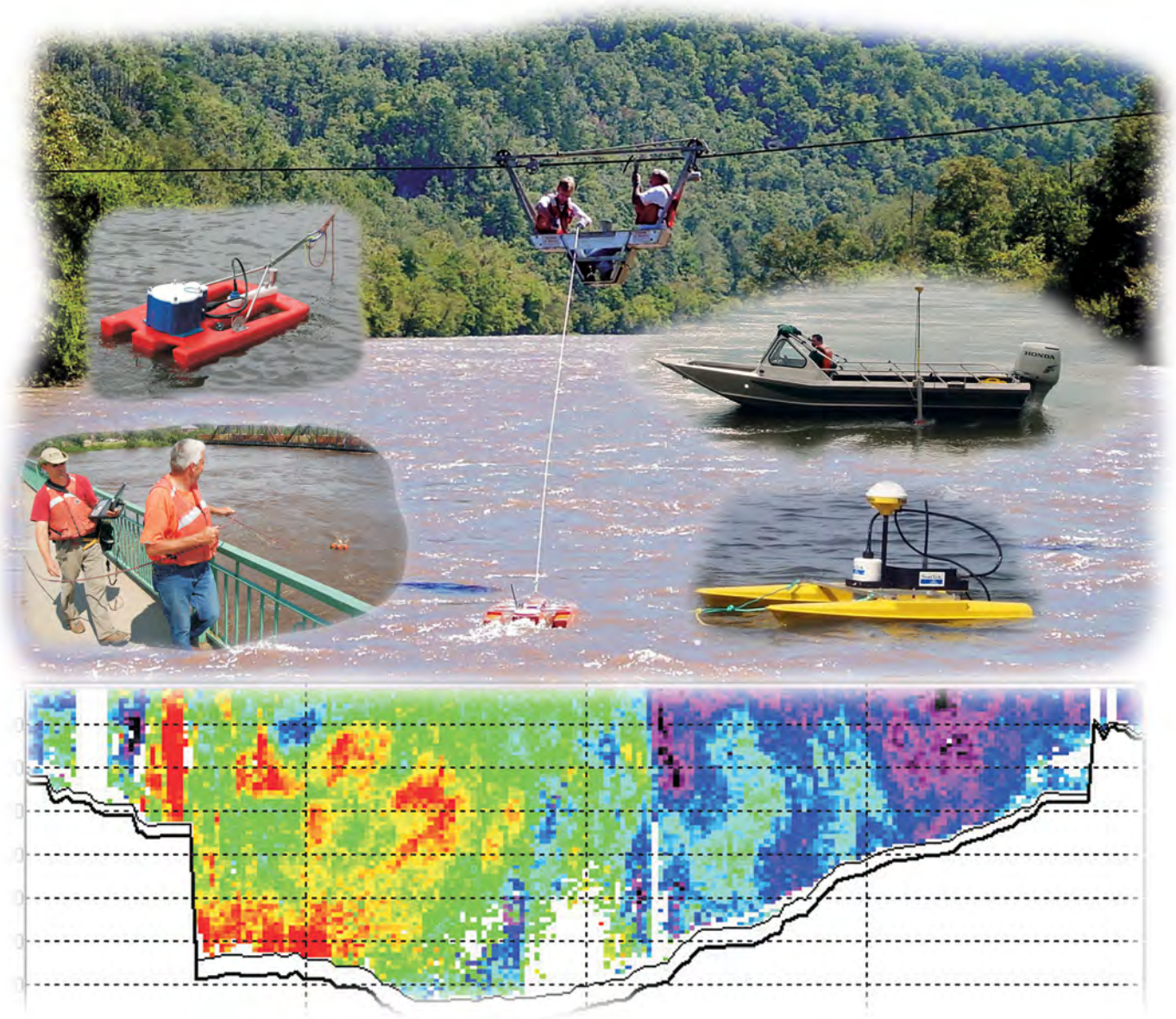
West Sacramento Southport EIP Task Order 1

Particle Size Distribution – Bedload

Project No. 10-1043 | Created By: JS | **Figure 10**

Measuring Discharge with Acoustic Doppler Current Profilers from a Moving Boat

Chapter 22 of Book 3, Section A



Techniques and Methods 3–A22

U.S. Department of the Interior
U.S. Geological Survey

Measuring Discharge with Acoustic Doppler Current Profilers from a Moving Boat

By David S. Mueller and Chad R. Wagner

Chapter 22 of Book 3, Section A

Techniques and Methods 3–A22

U.S. Department of the Interior
U.S. Geological Survey

manned boat, or a manned boat where little movement of the boat was ensured, a moving bed is determined to be present when the measured moving-bed velocity is greater than 1 percent of the mean water velocity at the test location. If the moving-bed test was conducted using a manned boat that was not anchored and may have moved either upstream or downstream, a criteria of 2 percent instead of 1 percent is used because uncertainty has been introduced into the test by the boat's movement. Discharge-measurement techniques that are not affected by a moving bed, or that correct for the effect of a moving bed, should be used if a moving bed has been detected (Appendix B).

A more accurate method for estimating the errors introduced by a moving bed can be determined if a GPS is available for use and is interfaced with the ADCP and the data-collection software. This second method also requires that the ADCP boat be held in a stationary position and a data file recorded for at least 5 minutes, if quality GPS data are being recorded. The error caused by the moving bed can be computed in the same manner as previously described for the first method, except that the distance in the upstream direction indicated by bottom tracking should be corrected by the distance actually traveled in that direction, as indicated by GPS (Oberg and others, 2005). In the WinRiver software, this distance can be found in the "compass calibration" tabular window and is labeled "BMG-GMG mag," and the direction of the "BMG-GMG dir" should be in the upstream direction. If the measured moving-bed velocity is greater than 1 percent of the mean water velocity at the test location, discharge-measurement techniques that are not affected by a moving bed, or that correct for the effect of a moving bed, should be used (Appendix B).

If the ADCP can be held stationary, stationary moving-bed tests are a good measure of the magnitude of an apparent moving streambed; however, these tests represent moving-bed conditions for only one location in the cross section. An alternative to the stationary moving-bed test is the loop method, which is based on the fact that as an ADCP is moved across the stream, a moving bed will cause the bottom-track-based ship track to be distorted in the upstream direction. Therefore, if an ADCP makes a two-way crossing of a stream (loop) with a moving bed and returns to the exact starting position, the bottom-track-based ship track will show that the ADCP appears to have returned to a position upstream from the original starting position (fig. 10). The mean moving-bed velocity can be computed from the distance the ADCP appeared to have moved upstream from the starting position (loop-closure error) and the time required to complete the loop. If the moving-bed velocity measured by the loop method is greater than 0.04 ft/s and greater than 1 percent of the mean water velocity, a moving bed is present. Discharge-measurement techniques that are not affected by a moving bed, or that correct for the effect of a moving bed, should be used if a moving bed has been detected (Appendix B). The loop method must be applied properly, or it may produce incorrect results. Anyone planning to use the loop method should read and follow USGS Scientific Investigations Report 2006–5079 (Mueller and Wagner, 2006), which describes the procedures, limitations, and uncertainties associated with the loop method. A detailed description of the loop method also is presented in Appendix B.

Discharge-Measurement Procedures

The procedures to be followed to make quality discharge measurements vary depending on the flow conditions being measured. The procedures for measuring steady-flow conditions are different from the procedures used to measure unsteady-flow conditions. Although the procedures may be different for the various flow conditions, the data-quality indicators for both conditions are consistent. The following sections provide details on the recommended procedures for measuring discharge in steady- and unsteady-flow conditions as well as data-quality problems to monitor in the field when making discharge measurements.

Steady-Flow Conditions

A discharge measurement in steady-flow conditions is obtained from the measurement of a minimum of four transects (two in each direction). The measured discharge is the average of the discharges from the four transects. If the discharge for any of the four transects differs by more than 5 percent from the mean measured discharge and no critical data-quality problem can be identified and documented, a minimum of four additional transects should be obtained, and the mean of all eight transects will be the measured discharge (U.S. Geological Survey, 2002b). If the discharge for one or more transects is not within 5 percent of the mean measured discharge and a critical data-quality problem can be identified

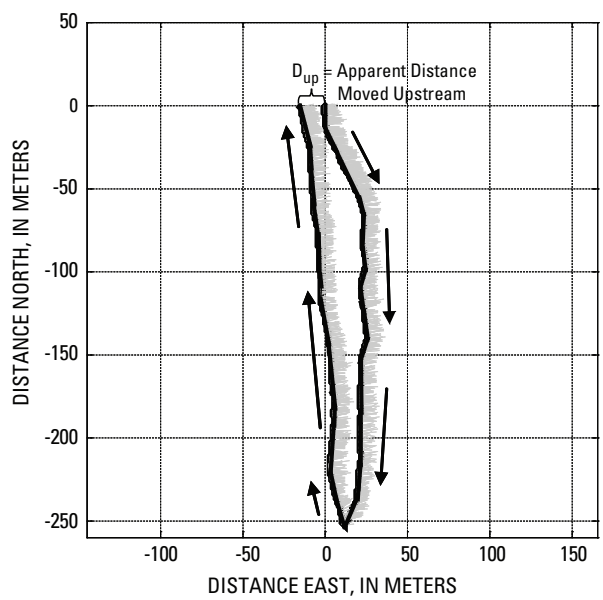


Figure 10. A distorted ship track in a loop caused by a moving bed.

and documented (for example, a tow boat approaching the section, a sudden change in discharge because of a lockage, communication problems between the computer and ADCP, or other factors), the transect deviating from the mean may be replaced with an additional transect collected in the same direction. Reciprocal transects should always be measured to reduce potential directional biases. Directional biases occur when the discharges measured for transects from the left bank to the right bank are consistently either greater than or less than discharges measured for transects made from the right bank to the left bank.

When the mean channel velocity is less than 0.8 ft/s, the TRDI StreamPro ADCP discharge measurements for individual transects have much greater variability than those StreamPro measurements made when the mean channel velocity is greater than 0.8 ft/s. Discharge measurements made when mean velocities were less than 0.8 ft/s had an average coefficient of variation for individual transect discharges of 12 percent, whereas measurements with mean velocities greater than 0.8 ft/s had an average coefficient of variation of 2.5 percent. Despite this larger variation, the measured discharges (the mean discharge for all transects) do not seem to be biased, provided that enough transects (potentially more than eight) are included in the mean discharge. When using a StreamPro ADCP in these slow conditions, a slow, steady boat speed is critical, and water mode 13 (WM13) should be used if the site conditions meet the criteria for maximum water speed (less than 0.8 ft/s) and depth (less than 3.3 ft). Additional details on the StreamPro ADCP testing results can be found in OSW Technical Memorandum 2005.05 (U.S. Geological Survey, 2005b).

Unsteady-Flow Conditions

At times, flow changes rapidly enough that discharge measurements within 5 percent of the mean cannot be collected from four transects. Unsteady flows can be caused by upstream dam or lock regulation, tidal effects, downstream backwater effects, flood waves, or other conditions. It may be necessary to use measurements from individual transects as discrete measurements of discharge if the flow is changing rapidly. If possible, however, pairs of reciprocal transects should be averaged together as one measurement of discharge to reduce the potential of directional bias (U.S. Geological Survey, 2002b). The justification for using a single transect or pairs of transects for discharge measurements should be documented in the field notes and stored with the discharge measurement or applicable station analysis files. Another consideration for unsteady flows, specifically bi-directional flows, is the assignment of a positive or negative sign to the discharge measurement. The ADCP software may or may not assign flow direction correctly, and the positive or negative sign also can change depending on which edge is designated “left” or “right.” Thus, the operator should note the direction of flow during measurement for each transect, according to accepted convention for a particular site.

Critical Data-Quality Problems

When making ADCP discharge measurements, the ADCP operator should continuously monitor the data through the ADCP software. If a critical data-quality problem is observed during measurement at a transect, the use of that transect may be terminated. If a transect is not used, the reason should be documented on the ADCP discharge-measurement field note form, and that transect should not be used in the computation of measurement discharge. If the problem was related to undesirable measurement-section characteristics, a new measurement section should be located and noted on the measurement field note form. If the terminated transect was not the first transect in a measurement series, the boat should be returned to the initial starting point to ensure the transects are measured in reciprocal pairs (Oberg and others, 2005). Potential critical data-quality problems can include, but are not limited to the following:

a. inappropriate or improperly configured water or bottom mode;

b. configuration errors, such as an insufficient number of depth cells to profile down to the channel bed;

c. appreciable or consistent portion of the section with invalid or missing data (invalid data failed to meet internal and user-specified data-quality criteria, and missing data are a result of communication problems between the computer and the ADCP);

d. appreciable invalid bottom tracking;

e. erroneous boat or water velocities, such as ambiguity errors (Appendix A);

f. excessive boat speed;

g. poor GPS data attributed to multipath, satellite changes, or high dilution of precision (DOP);

h. excessive pitch-and-roll or erratic motion of boat and ADCP; and,

i. inadvertent early termination of the transect.

Boat Operation

Average boat speed during each transect normally should be less than or equal to the average water speed. At some sites, it may be necessary to move the boat across the channel using a non-ferrous tag line in order to meet this requirement. Other methods for moving the boat slow enough to be equal to or less than the water speed include the use of push poles, paddles, low-speed trolling motors, or tethered boats, which can be moved slowly across the channel when deployed from

a hand-operated cableway or a bridge. In certain conditions, it may not be possible to keep the boat speed less than the water speed. If it is not practical or safe to keep the boat speed less than or equal to the average water speed, additional transects may be measured to obtain a good average discharge. The reason that the boat speed was higher than the average water speed should be documented on the ADCP discharge-measurement field note form. Ongoing research (Oberg and Mueller, 2007a) indicates that the number of transects and the boat speed are not as important as the cumulative time in which data are collected and averaged. A cumulative time for data collection of at least 720 seconds should result in a good mean discharge in steady-flow conditions. When using GPS, keeping the boat speed as low as practical is especially important because errors in the compass readings are additive and increase with boat speed. Rapid course changes should be avoided; the key element in boat operation during the measurement is to do everything slowly and smoothly. Simpson (2002) discusses proper boat operation for ADCP measurements in detail, and his remarks on boat operation should be heeded (Simpson, 2002, p. 122):

> "Be a smooth operator! The BB [broadband]-ADCP discharge-measurement system will give more consistent results if rapid movements and course changes are kept to a minimum. Smooth boat motion is more important than a straight-line course."

stationary from 5 to 10 seconds at the beginning and end of each transect. Accurate edge-discharge estimates also require the ADCP operator to select the correct edge-shape coefficient for the type of edge (sloping or vertical). The edge shapes should be recorded in the ADCP discharge-measurement notes (Oberg and others, 2005).

When using a tethered boat, special methods are required to measure edge distances. Distance marks on the bridge handrail or guardrail may be used to measure edge distances (fig. 11). If the tethered boat is too far away from the bridge to accurately use distance marks for measuring edge distances, laser rangefinders having a compass, an inclinometer, and a "missing-line mode" capability may be used. Missing-line mode calculates a horizontal distance between two points, given a range, heading, and vertical angle measured for each point. Edge distance may be measured by selecting the shore and the transect start or end point while using this mode (Rehmel and others, 2002).

When using a remote-controlled boat at some sites, edge distances may be measured using the same techniques as with tethered boats. At other sites where edge distances cannot be measured using these techniques, it may be necessary to have someone in line with the measurement section to measure the distance from the near-shore edge of water to the starting point and the distance from the ending point to the edge of water on the far shore.

Estimating Edge Discharge

Because depths will eventually get too shallow for valid data collection as the ADCP approaches a bank, it is necessary to estimate discharge in the near-shore unmeasured zones using the ADCP discharge-measurement software. To ensure the accuracy of near-shore discharge estimates, the distances from the edge of water to the starting and stopping points of each transect must be measured using a distance-measurement device (such as a laser or optical rangefinder), tagline, or some other accurate measurement device. Placing marker buoys at the start and end points of transects is advantageous for keeping consistent edges. Use of marker buoys enhances the data collection by ensuring more consistent edge estimates and by measuring in approximately the same section for all passes. When measuring in channels with vertical walls at the edges, start and stop points for transects should be no closer to the wall than the depth of water at the wall to prevent acoustic interference from the main beam or side lobes impinging on the wall. For example, if the depth at a vertical wall is 10 ft, transects should start or stop at least 10 ft away from the wall. In order to obtain an accurate mean velocity for estimating the discharge in the near-shore zones, the boat should be kept nearly

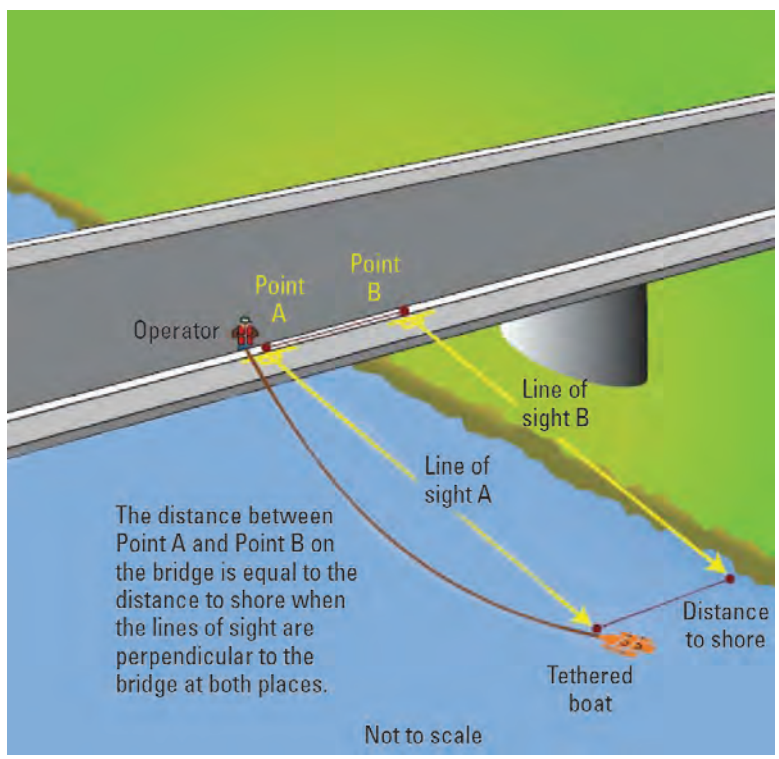


Figure 11. Edge distances needed when using a tethered acoustic Doppler current profiler boat for discharge measurements (modified from Environment Canada, 2004).

Field Notes

All information on an ADCP measurement field note form should be filled out during the course of the measurement. The ADCP operator should note any conditions that potentially could affect the measurement, including estimated wind speed and direction, bi-directional or unusual flow patterns, excessive waves, or passing boats. Use of an ADCP does not negate long-standing, agency guidelines and policies regarding measurement documentation, such as recording reference gage heights before, after, and, if needed, during the discharge measurement. An example of a completed USGS ADCP discharge-measurement field note form is shown in figure 12 (Oberg and others, 2005).

Step-by-Step Procedure

The steps for making a discharge measurement using an ADCP are not complex, but each step must be completed to ensure quality data. To assist the field hydrographer, quick-reference guides that detail the step-by-step procedure for making ADCP discharge measurements, along with other pertinent information, are presented in Appendix E, figures E-3–E-6. These guides can be printed, laminated, and kept with the ADCP for reference.

Post-Measurement Field Procedures

An assessment of the discharge measurement should be made after completion of the transects composing the measurement. A thorough review of all measurement data may not be practical in the field, but a cursory review of the measurement should be made in order to assign a preliminary quality rating to the measurement and to ensure that specific transects do not have critical data-quality problems. If all data were collected at the same measurement section, the transect widths and discharges in the measured (middle) and unmeasured (top, bottom, and edge) sections should be consistent. If transect widths or discharges are not consistent with those of the other transects, the transect data should be scrutinized to determine if a critical data-quality problem occurred (examples of critical data-quality problems are listed in the Discharge-Measurement Procedures section of this report). If a critical data-quality problem is identified, the data from the affected transect should not be used in the computation of discharge. A new transect should be measured, starting from the same side as the discarded transect, if flow conditions have remained steady. If the flow has changed, a new transect series should be collected. A minimum of four transects should be measured if the flow is stable when the new discharge data are collected. A transect should be discarded only if a critical data-quality problem is identified and documented on the field note form. Site-specific conditions, such as turbulence, eddies, reverse flows, surface waves, moving bed, high sediment concentration, and proximity of the instrument to ferrous objects, should be noted under the appropriate sections on the ADCP measurement field note form and used in assigning a quality rating for the measurement (Lipscomb, 1995).

If the discharge measurement was collected at a site with a rating curve, the measured discharge should be plotted on the rating curve for that streamgaging station, and the percentage of difference from the stage-discharge rating should be computed. Rantz and others (1982, p. 346) state: *"If the discharge measurement does not check a defined segment of the rating curve by 5 percent or less, or if the discharge measurement does not check the trend of departures shown by recent measurements, the hydrographer is normally expected to make a second discharge measurement to check his original measurement."* Rantz (1982, p. 346–347) then describes procedures for making check discharge measurements with mechanical current meters. For ADCPs, power off all equipment and begin with step 1c in figure E-3 of Appendix E and proceed through the remainder of the procedures. If practical, choose a new measurement cross section for the check measurement. The measured discharge from the check measurement should then be plotted on the rating curve, and the percentage of difference from the discharge rating should be computed in the field.

Immediately after completion of a measurement, all files, including raw data files, configuration files, instrument test files, compass calibration files, and any electronic measurement forms, should be backed up on nonvolatile media, such as CD-ROMs, flash-memory cards, or USB drives, and stored separately from the field computer. The purpose of this backup is to preserve the data in the event of loss or failure of the field computer.

The ADCP should be dried after use and stored in its protective case for transport. When working in estuaries and other saltwater environments, the ADCP must be rinsed off with freshwater and dried prior to storing for transport. Failure to dry the ADCP may result in corrosion of the ADCP connectors, mounting brackets, and any ADCP accessories stored in the protective case (Oberg and others, 2005).

Office Procedures

Upon returning to the office from field data collection, routine maintenance of equipment should be completed, all data files and notes should be stored properly, data should be reviewed, and measurements should be finalized and archived. Adherence to these procedures will ensure the equipment is ready for the next deployment and that data are reviewed and processed in the most efficient manner.

Preventive Maintenance

The ADCP and associated accessories, such as GPS, vertical depth sounders, and electronic rangefinders, should be inspected upon returning from the field to determine their

Acoustic Profiler Discharge Measurement Notes							Filename Prefix: foxmon_ds1200_
Left Bank:	Sloping Vertical Other:_____					Right Bank:	Sloping Vertical Other:_____
Transect No.	Starting			Ending		Total Discharge	Notes
	Bank	Time	Distance	Distance	Time		
0	L R						Moving bed test in center of channel
1	L R	1249	16	69	1255	1,321	Simultaneous comparison discharge meas.
2	L R	1256	69	16	1301	1,358	Upstream of dam
3	L R	1301	69				Transect aborted due to debris in river
4	L R	1303	69	16	1308	1,327	
5	L R	1309	16	69	1315	1,356	
	L R						
	L R						
	L R						
	L R						
	L R						
	L R						
	L R						
Notes	All times are CST. Measurement was made using a temporary rope-and-pulley cableway. Edge distances were measured with laser rangefinder by marking the start and ending positions on the rope and measuring the distance from edge of water to the center of the tethered boat.						

9-275-1 10/24/08 U.S. DEPARTMENT OF THE INTERIOR *U.S. Geological Survey* *Meas. No.* 57

Station Number 05551540 **ADCP Discharge Measurement Notes** *Processed by* BLL *Checked by* KAO

Station Name Fox River at Montgomery, IL

Date July 6, 2004 *Party* B. L. Loving, S.E. Anderson

Width	*Area / Rated Area*	*Velocity*	*Index Vel.*	*Gage Height*	*Discharge*
235	707	1.9		11.74	1,350

Gage Height Change	*Meas. plots*	*From rating*	*Shift*	*ADCP Sync'd to WT*
0.00 in 0.4 hrs.	*1.1 % diff*	*No.: 4*	*0*	*Y at 1207 or N*

ADCP Mfr / Model / Frequency	*Serial No.*	*Firmware*	*Software*
TRDI/Rio Grande/1200	1636	10.14	WinRiver 10.06

Boat/Motors Used	*GPS Used*	*ADCP Depth*	*Diag. Test / Errors?*
OceanScience Tethered	Trimble AgGPS	0.27 ft	☒ Y or (N)

Compass Calib. & Total Error	*Mag. Var*	*Mag Var Method*	*Moving Bed?*
Y or N	-2.4	*On-site (Model) Previous*	*Y or (N)*

Meas. Water Temp	*ADCP Water Temp*	*Weather / Air Temp*	*Wind Speed / Dir.*
26.5 °F (C) at 1210	*26 °F (C) at 1210*	*Sunny & clear 83 (°F) C*	*Southerly @ 5-10*

Gage Readings

Time		ETG	CR10	*Inside*	*Outside*
1100		11.74	11.70		11.70
1230			11.70		±0.05
1249	(s)		11.70		
1300			11.70		
1315	(f)		11.70		
1400		11.74	11.70		11.70
					±0.05
Weighted MGH		11.74			
GH corrections					
Correct MGH		11.74			

Site Conditions

Max Water Depth	10 f
Max Water Speed	2.5fps
Max Boat Speed	1 fps
Water Mode	12
Bottom Mode	5
Streambed material	
Gravel	
Salinity	
-- *ppt at* --	
Checkbar found	22.41
Checkbar changed to:	
at	

Wading (cable) ice, boat, upstr., downstr., side bridge 1,500 *(ft) mi. upstr. (downstr.) of gage*

Measurement rated: *excellent (2%) good (5%) fair (8%), poor (>8%)* *based on following conditions*

Flow Steady & uniform. Flow at edges appears to be moving in ds direction.

Cross section: Sand and gravel with some mud

Control: Dam is clear of debris

Gage operating:	*Y or N*	*Record removed:*	*Y or (N)*	*Filename:*	Telephone telemetry		
Battery voltage	*12.5 V*	*Intakes Orifice cleaned/purged:*		No			
Bubble-gage psi:	*Tank*	--	*Line*	--	*Bubble rate*		--/min
Extreme-GH indicators:	*Max*	--	*Min*	--	*CSG Checked*	*Y or N*	
HWM on stick	none	*Refelev.*	12.65	*HWM elevation*	none		
GH of zero flow = GH	--	*- depth at control*	--	= --ft	*Rated=*	10.48	

Sheet No. 1 *of* 1 *sheets*

Figure 12. Example of completed acoustic Doppler current profiler discharge-measurement field note form (Oberg and others, 2005).

condition. Deployment platforms and mounts also should be inspected. Damage or undue wear to any instrument components, deployment platforms, or mounts should be corrected as soon as possible. The ADCP, all accessories, platforms, mounts, and field computers should be prepared for redeployment and stored in an appropriate location. All batteries should be recharged immediately to facilitate rapid reuse.

Data Storage

All measurement data should be moved from the field computer or field backup media to a permanent storage location for archival and backup. Field computers used to collect ADCP data should have local area network (LAN) capability to facilitate the process of transferring the measurement data to an office server.

Measurement Review Procedures

Discharge measurements should be reviewed in detail by the person who made the measurements as soon as practical after completion of ADCP field measurements. ADCP discharge measurements should be routinely checked by someone other than the person who made the measurement, in accordance to specific agency policies.

Important aspects of reviewing ADCP discharge measurements both in the office and in the field as soon as the data are collected are listed below.

1. The discharge-measurement field note forms should be complete, understandable, and legible.

2. All electronic data files associated with the measurement should be backed up in the field and archived on an office server.

3. The number of transects measured should be appropriate for the flow conditions and satisfy agency policy. Transects should be measured in reciprocal pairs.

4. Configuration files should be checked for errors, appropriateness for the hydrologic conditions, and consistency with field notes. ADCP depth, salinity, edge distances, edge shapes, extrapolation methods, and ADCP configuration parameters listed on the field notes should match those in the configuration file.

5. The temperature measured by the ADCP thermistor should be reasonable for the site and time of year and match the water temperature measured and noted on the field form. Speed-of-sound calculations that are not corrected for temperature can cause velocity-measurement errors and depth errors as great as 7 percent. An error in temperature caused by a faulty ADCP thermistor results in an erroneous calculation of water density and introduces uncertainty into the speed-of-sound calculations (Simpson, 2002).

6. The salinity of the water at the measurement site should be measured and noted on the field form and entered into the ADCP software for use in the speed-of-sound calculations. If the hydrographer has entered an incorrect salinity value or has forgotten to enter the proper value, depths and velocities will be calculated incorrectly. Errors in excess of 3 percent can be caused by speed-of-sound calculations that are not corrected for salinity (Simpson, 2002).

7. A moving-bed test using proper technique should be performed prior to the discharge measurement, recorded, archived, and noted on the ADCP measurement field note forms. If a moving bed was detected, GPS should be used. If GPS was not used, the measured discharges should be adjusted for the moving bed (Appendix B).

8. The average boat speed for the measurement should not have exceeded the average water speed unless it was impractical or unsafe to do so. The reason for any exceedance should be documented in the field notes or station file. Boat pitch-and-roll should not be excessive. Excessive boat speed or pitch-and-roll may justify downgrading the measurement quality.

9. The measured edge distances recorded on the ADCP measurement field form should match those electronically logged with each transect. The correct edge shape should be selected and 5–10 seconds of data collected at transect stop and start points while the boat is held stationary. If subsectioning was used to correct problems with edges, then the reason for subsectioning should be clearly documented on the field forms. If a vertical wall is present, then the start and end points for the transect should be located such that the distance from the wall is equivalent to or greater than the water depth at the wall.

10. The number of missing or invalid ensembles should not be excessive. (An ensemble is a single profile of the water velocity through the water column consisting of one or the mean of multiple pings.) The number of missing or invalid ensembles that will result in a poor measurement is difficult to establish because the location and clustering of the missing or invalid ensembles is important. If 50 percent of the ensembles were missing or invalid, but every other ensemble was valid, the measurement could still be a good measurement. However, if 10 percent of the ensembles were missing or invalid, but they all occurred in one location where the neighboring valid data would be a poor representation of what was unmeasured, the measurement would be poor. When the missing or invalid ensembles always occur in

in the cross section. The time required to collect a proper sample can vary from 5 seconds or less to several hours or more. Generally, a sampling time that does not exceed 60 seconds is preferred. Because of the temporal variations in bedload transport rates, there is no easy way to determine the appropriate sampling time. Several test samples (as many as 10 or more collected sequentially at a vertical with a suspected high transport rate) may be needed in order to estimate the proper sampling-time interval to be used. The sample time should be short enough to allow for the collection of a sample from the section with the highest transport rate, without filling the sample bag more than about 40 percent full. The sample bag may be filled to 40 percent full with sediment coarser than the mesh size of the bag without reducing the hydraulic efficiency of the sampler (Druffel and others, 1976). Sediment that is approximately equal to the mesh size may clog the bag and cause a change in the sampling efficiency of the sampler.

(3) One sample should be collected at each vertical, starting at one bank and proceeding to the other. It is recommended that, during this initial data gathering stage, a minimum of one transect using the SEWI method be used. The samples should be placed in separate bags for individual analysis and labeled with the vertical's station number. They may be composited into one or several sample bags for a composite analysis, but if composited, no information on cross-sectional variability can be obtained from the data.

(4) A second sample should be collected using the UWI or MEWI methods. Four or five verticals should be sampled four or five times each, obtaining a total of 20 samples. Samples should be collected using the same procedure as described in number 2 above, except that the sample time for each sample need not be the same. All samples should be bagged and tagged for separate analysis.

(5) The following data must be recorded on a field note sheet for each cross-section sample:

- Station name/number
- Date
- Cross-section sample starting and ending times
- Gage height at the start and end of sample collection
- Total width of the cross section, including stations on both banks
- Width between verticals (SEWI method)
- Number of verticals sampled (SEWI method)
- Station of verticals sampled (UWI or MEWI method)
- Time sampler was on the bottom at each vertical
- Type sampler used
- Name of person collecting sample

In addition, the following information should be recorded on each sample container:

- Station name
- Date
- Designation of cross-section sample to which the container belongs (that is, if two cross-section samples were collected, one would be "A" and the other "B")
- Number of containers for that cross section (for example, "1 of 2" or "2 of 2")
- Stations(s) of the vertical(s) the sample was collected from
- Time sampler was on the bottom and at the vertical station
- Clock time the sample was collected (start and finish if composite)
- Collector's initials

Analysis of the first transect (SEWI method) will give some indication of the cross-sectional variability if individual verticals are analyzed separately. Analysis of the second set of transects (UWI or MEWI method) will give some indication of temporal variability. As stated before, the procedure described above should be considered the minimum to be followed when first collecting bedload data at a site. Additional samples and transects will help define the temporal and spatial variation at the site for all flow ranges. After a cross section has been sampled several times at different flow ranges using the above procedure, it should be possible to develop a sampling protocol that fits the site better.

Computation of Bedload-Discharge Measurements

The bedload transport rate at a sample vertical may be computed by the equation

$$R_i = \frac{KM_i}{t_i} \tag{1}$$

where

R_i = bedload transport rate, as measured by bedload sampler, at vertical i, in tons per day per foot;

M_i = mass of the sample collected at vertical i, in grams;

t_i = time the sampler was on the bottom at vertical i, in seconds; and

K = a conversion factor used to convert grams per second per foot into tons per day per foot. It is computed as

$$K = (86{,}400 \text{ seconds/day}) \frac{1 \text{ ton}}{(907{,}200 \text{ grams})} \frac{1 \text{ foot}}{(N_w)} \qquad (2)$$

where

N_w is the width of sampler nozzle in feet. (For a 3-inch nozzle, $K = 0.381$; for a 6-inch nozzle, $K = 0.190$.)

The cross-sectional bedload discharge measured by the Helley-Smith sampler may be computed using the total cross-section, midsection, or mean-section method. The simplest method of calculating bedload discharge from a sample collected with a Helley-Smith type bedload sampler is the total cross-section method (fig. 54). This method should only be used if the following three conditions are met:

1. The sample times (t_i) at each vertical are equal.
2. The verticals were evenly spaced across the cross section (that is, SEWI or MEWI method used).
3. The first sample was collected at one-half the sample width from the starting bank.

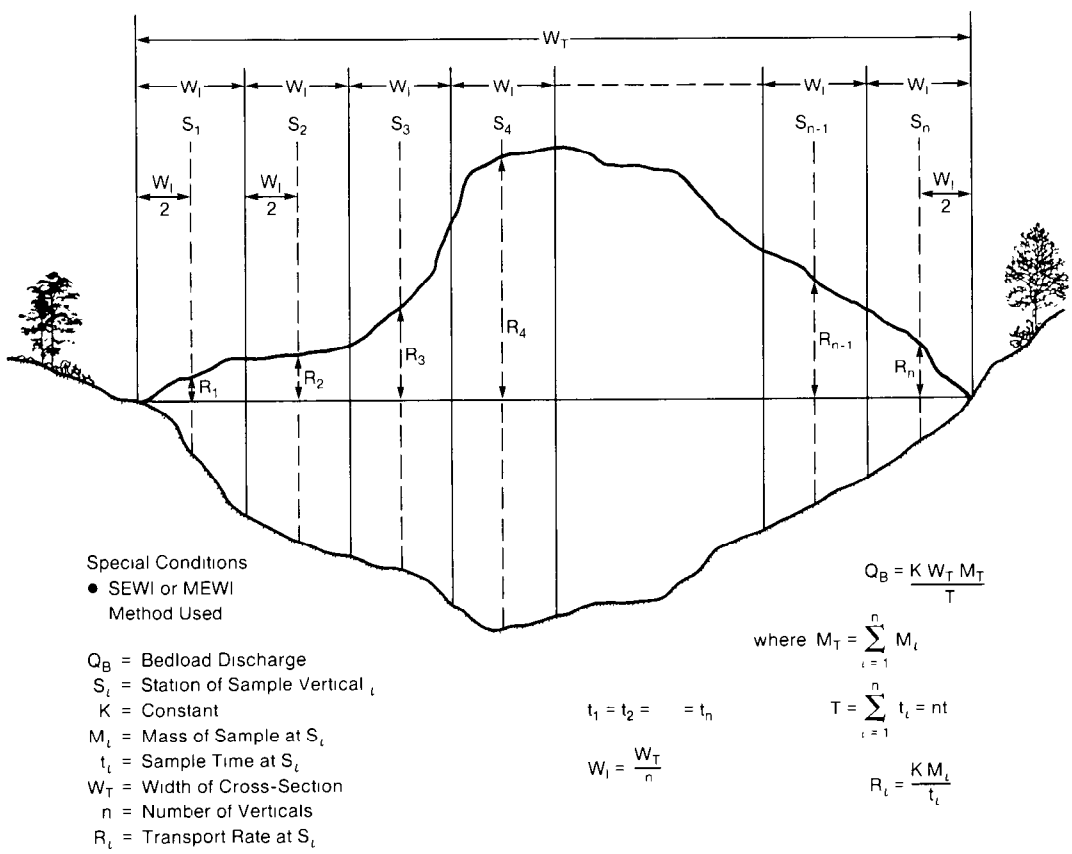


Figure 54. Total cross-section method for computing bedload discharge from samples collected with a Helley-Smith bedload sampler.

If these conditions are met, then

$$Q_B = K\frac{W_T}{t_T}M_T \qquad (3)$$

where

Q_B = bedload discharge, as measured by bedload sampler, in tons per day;

W_T = total width of steam from which samples were collected, in feet, and is equal to the increment width (W_i) times n (n = total number of vertical samples);

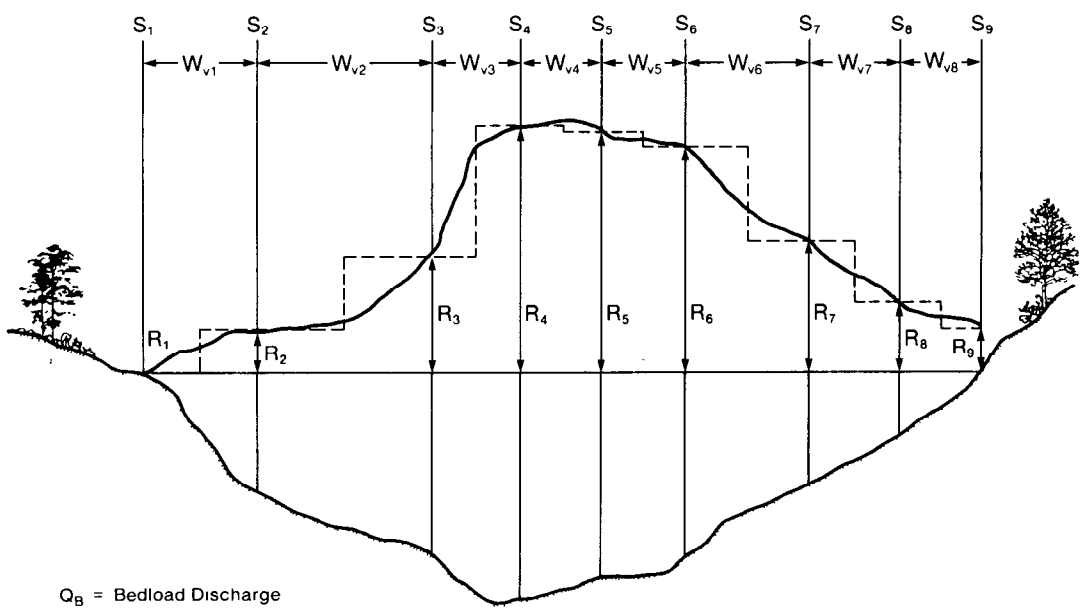
t_T = total time the sampler was on the bed, in seconds, computed by multiplying the individual sample time by n;

M_T = total mass of sample collected from all verticals sampled in the cross section, in grams; and

K = conversion factor as described in equation 2 above.

If any of the three conditions stated above are not met, then either the midsection or mean-section method should be used. Mathematically, the two methods, if used with no modifications, will produce identical answers. However, as indicated under the discussion of the UWI method, the placement of the sampling verticals with respect to breaks in the lateral cross-sectional distribution curve of mean bedload transport rate will somewhat dictate which method should be used. The midsection method (fig. 55) is computed using the following equation:

$$Q_B = \frac{R_1W_1}{2} + \sum_{i=2}^{n-1} R_i\left[\frac{(S_i - S_{i-1})}{2} + \frac{(S_{i+1} - S_i)}{2}\right] + \frac{R_nW_{n-1}}{2} \qquad (4)$$



Q_B = Bedload Discharge
S_i = Station of Sample Vertical i
R_i = Transport Rate at S_i
K = Constant
M_i = Mass of Sample Collected at S_i
t_i = Sample Time at S_i
n = Number of Verticals
W_{vi} = Width Between Verticals i and $i+1$

$$Q_B = \frac{R_1W_{v1}}{2} + \sum_{i=2}^{n-1} R_i\left[\frac{(S_i - S_{i-1})}{2} + \frac{(S_{i+1} - S_i)}{2}\right] + \frac{R_n W_{vn-1}}{2}$$

$$= \frac{K}{2}\left[\frac{M_1}{t_1}W_{v1} + \frac{M_n}{t_n}W_{vn-1} + \sum_{i=2}^{n-1}\frac{M_i}{t_i}(S_{i+1} - S_{i-1})\right]$$

Figure 55. Midsection method for computing bedload discharge from samples collected with a Helley-Smith bedload sampler.

where

W_i = width between sampling verticals i and i+1, in feet;

S_i = stations of the vertical (i) in the cross section measured from some arbitrary starting point, in feet; and

Q_B, n, R, and K have previously been defined,

You will note that equation 3 is very similar to the equation used to compute a surface-water discharge measurement. This method corresponds to the midpoint method currently used to compute surface-water discharge measurements (Buchanan and Somers, 1969). By combining equations 1 and 4 and rearranging terms:

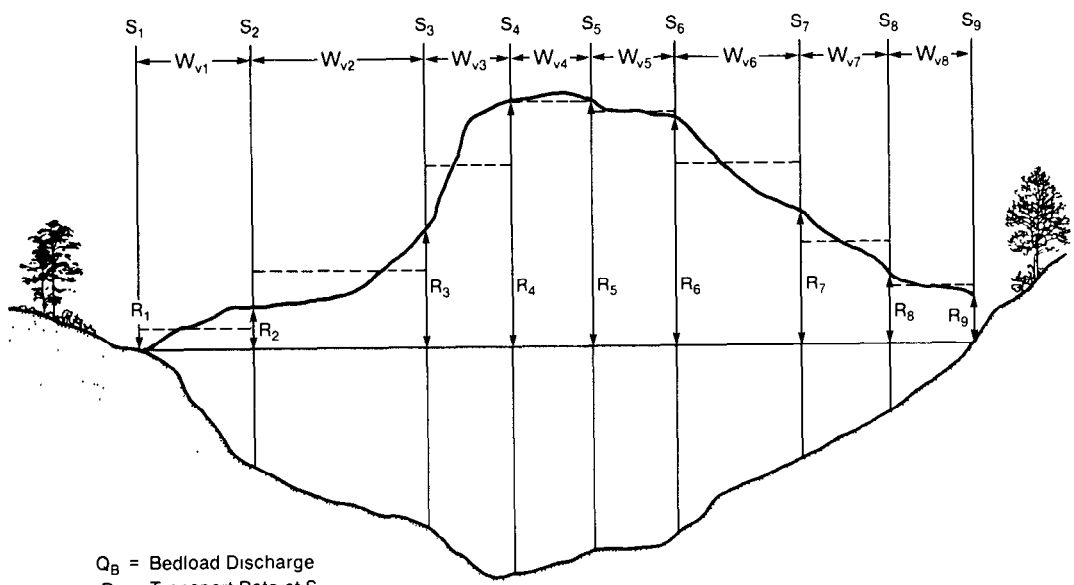
$$Q_B = \frac{K}{2}\left[\frac{M_1 W_1}{t_1} + \frac{M_n W_{n-1}}{t_n} + \sum_{i=2}^{n-1} \frac{M_1}{t_i}(S_{i+1} - S_{i-1})\right] \quad (5)$$

One advantage to using the midsection method is that the distance W_1 need not necessarily be equal to the distance between sampling verticals. At times, it may become apparent, due to local conditions, that a particular R_1 should not be applied over a width equal to halfway back to the last station and halfway forward to the next, but applied to some other width. This width, sometimes referred to as the effective width, is decided on by the user. Bridge piers, large boulders, abrupt changes in velocity or lateral bed topography, or other conditions that may obstruct or cause sudden changes to bedload transport rate will affect the selection of the effective width.

The third method, the mean-section method (fig. 56), is computed using the following equation:

$$Q_B = \sum_{i=1}^{n-1} W_i \frac{(R_i + R_{i+1})}{2}, \quad (6)$$

which is equivalent to:



Q_B = Bedload Discharge
R_i = Transport Rate at S_i
K = Constant
M_i = Mass of Sample at S_i
t_i = Sample Time at S_i
n = Number of Verticals
S_i = Station of Sample Vertical i
W_{vi} = Width Between Verticals i and $i+1$

$$Q_B = \sum_{i=1}^{n-1} W_{vi} \frac{(R_i + R_{i+1})}{2} = \frac{K}{2}\sum_{i=1}^{n-1} W_{vi}\left(\frac{M_i}{t_i} + \frac{M_{i+1}}{t_{i+1}}\right)$$

Figure 56. Mean-section method for computing bedload discharge from samples collected with a Helley-Smith bedload sampler.

$$Q_B = \frac{K}{2}\sum_{i=1}^{n-1} W_1\left(\frac{M_i}{t_i} + \frac{M_{i+1}}{t_{i+1}}\right) \qquad (7)$$

All the above terms are the same as used in the midsection method. This method averages the two adjoining rates and applies the average rate over the distance between them. For this reason, it is important to try to place the sampling verticals at points where the trends in lateral mean bedload transport rate change. Under most field conditions, this might be difficult.

For situations where the total cross-section method cannot be used, it is recommended that the midsection method be used. This recommendation is made because of its similarity to the surface-water discharge-measurement method, which most field personnel are familiar with, and because of the flexibility in using the effective width concept.

Collecting bedload samples will generate 40 or more samples, creating a potential problem regarding transportation and analyses of so many samples. Carey (1984) adapted a procedure for measuring the submerged weight of bedload samples in the field and converting that measurement to dry weight from a laboratory procedure used by Hubbell and others (1981). The method uses the basic equation

$$W_{ds} = \frac{SG_s}{SG_s - 1} W_{ss} \qquad (8)$$

where

W_{ds} = dry weight of the sediment;

SG_s = specific gravity of the sediment; and

W_{ss} = submerged weight of the sediment.

Measurements for Total Sediment Discharge

Total sediment discharge is the mass of all sediment moving past a given cross section in a unit of time. It can be defined as the sum of the (1) measured and unmeasured sediment discharges, (2) suspended-sediment discharge and bedload discharge, or (3) fine-material discharge (sometimes referred to as the washload) and coarse-material or bed-material discharge.

There are some sand-bed streams with sections so turbulent that nearly all sediment particles moving through the reach are in suspension. Sampling the suspended sediment in such sections with a standard suspended-sediment sampler represents very nearly the total load. Several streams with turbulent reaches are described in Benedict and Matejka (1953). Further discussion concerning total-load measurement also can be found in Inter-Agency Report 14 (Federal Inter-Agency Sedimentation Project, 1963b, p. 105–115). Turbulence flumes or special weirs can be used to bring the total load into suspension. Total load can usually be sampled with suspended-sediment samplers to a high degree of accuracy where the streambed consists of an erosion resisting material such as bedrock or a very cohesive clay. In such situations, most, if not all, the sediment being discharged is in suspension (or the bed would contain a deposit of sand).

Benedict and Matejka (1953) and Gonzales and others (1969) have described some structures used for artificial suspension of sediment to enable total-load sampling. However, most total-load sampling is usually accomplished at the crest of a small weir, dam, culvert outlet, or other place where the sampler nozzle integrates throughout the full depth of flow from the surface to the top of the weir.

Where such conditions or structures are not present, the unmeasured load must be computed by various formulas. The unmeasured load can be approximated by use of a bedload formula such as that of Meyer-Peter and Muller (1948), Einstein (1950), Colby and Hembree (1955), or Chang and others (1965). However, these computational procedures can give widely varying answers. The Colby and Hembree (1955) method [modified from Einstein (1950)] determines the total load in terms of the amount transported for different particle-size ranges. Colby and Hubbell (1961) later simplified the modified Einstein method to include the use of four nomographs in lieu of a major computational step. The essential data required for the Colby and Hubbell technique at a particular time and location are listed here:

1. Stream width, average depth, and mean velocity.
2. Average concentration of suspended sediment from depth-integrated samples.
3. Size analyses of the suspended sediment included in the average concentration.
4. Average depth of the verticals where the suspended-sediment samples were collected.

5. Size analyses of the bed material.
6. Water temperature.

Stevens (1985) has developed two computer programs for the computation of total sediment discharge by the modified Einstein procedure. One program is written in FORTRAN 77 for use on the PRIME computer; the other is in BASIC and can be used on most microcomputers.

Hubbell (1964) gives the following formula for determining the total sediment discharge of a given size range from the measured suspended-sediment discharge and the discharge measured with any type of bedload apparatus (see fig. 57).

$$Q_T = \frac{Q_D}{eff} + Q_{sm} + Q_{usm1} - FQ_{sm} + (1 - E/e)Q_{ts2} \quad (9)$$

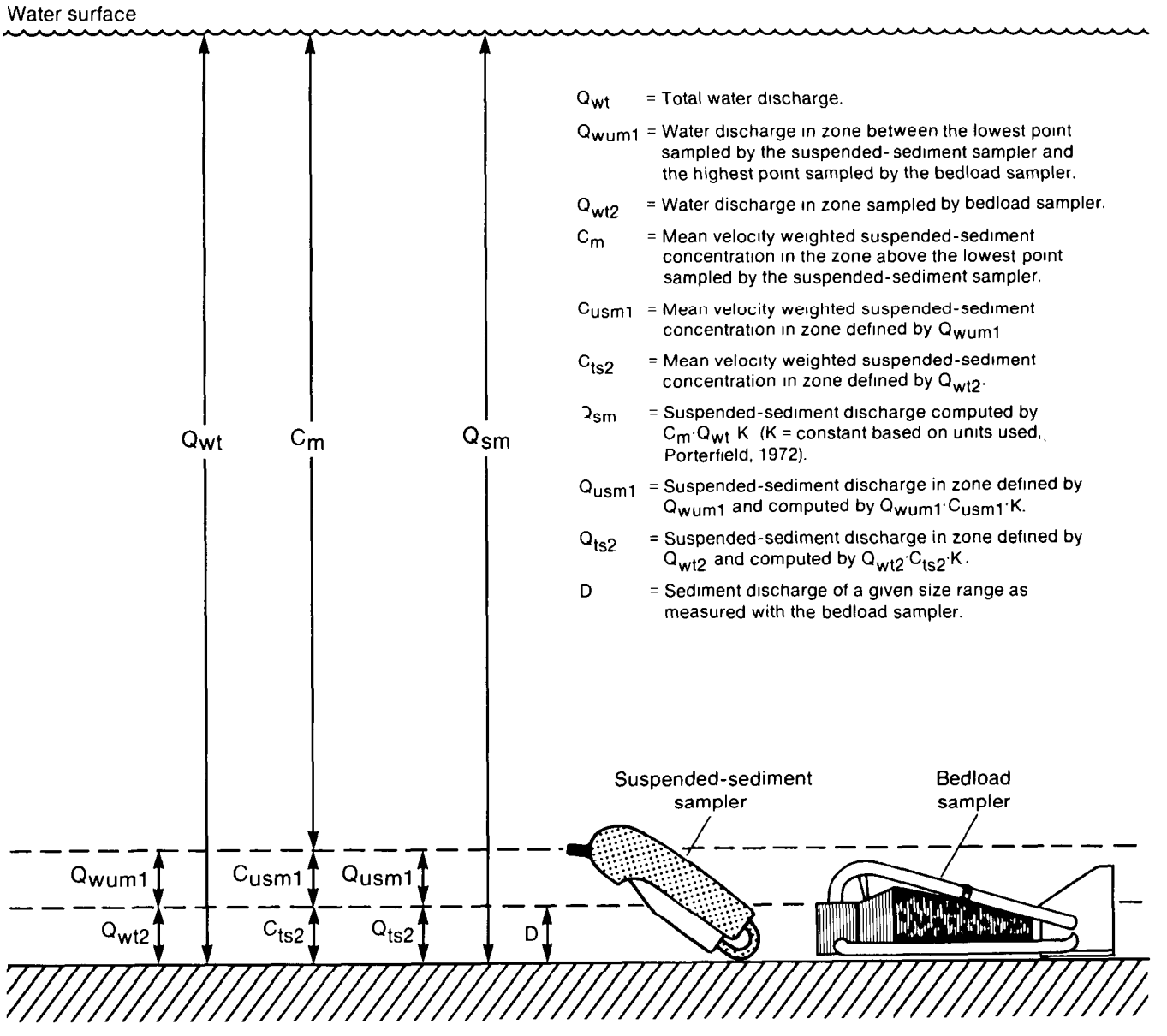


Figure 57. Zones sampled by suspended-sediment and bedload samplers and the unmeasured zone.

Appendix C.8

Technical Memorandum—
Existing Conditions Sediment Transport Assessment—
cbec inc., eco engineering, November 7, 2011

TECHNICAL MEMORANDUM

Date:	11/07/2011
To:	Michael Vecchio (HDR Engineering)
From:	John Stofleth, M.S., EIT, Chris Campbell, M.S., EIT, Chris Bowles, Ph.D., PE
Project:	11-1013 – West Sacramento Southport EIP Task Order 3
Subject:	Existing Conditions Sediment Transport Assessment

INTRODUCTION

cbec inc., eco engineering (cbec), is providing hydrodynamic and geomorphic assessment and design services to the Southport EIP project team. Prior assessments were based on field data collection (Task Order 1), ongoing field data collection efforts, preliminary sediment transport assessment of 1-dimensional (HEC-RAS) modeling results provided by MBK Engineers (MBK), and a historic geomorphic analysis (all Task Order 2). Task Order 3 includes a detailed 2-dimensional hydrodynamic and sediment transport assessment of the existing conditions through the project reach as described in this memorandum. The modeling described herein provides the foundation for detailed hydrodynamic and sediment transport analysis of project alternatives and the preferred design alternative, including levee setback alignments, and corresponding erosion assessments to be conducted under future efforts (partially in Task Order 3 and ultimately in Task Order 4). The modeling will also be used to inform habitat mitigation and enhancement solutions for the setback project.

A series of hydrologic events were simulated using a hydrodynamic and sediment transport model, MIKE 21C. MIKE 21C is a 2–dimensional, curvilinear computation mesh, hydrodynamic model that calculates depth-averaged flow velocity, flow direction, flow depth and energy gradient for elements that represent the channel and floodplain (http://www.mikebydhi.com/). The preliminary results presented in this technical memorandum include existing conditions for the Southport EIP project and are intended to serve an interim deliverable. The ultimate product will include simulations of the preferred design alternative with analysis that will examine the relative impacts on hydraulics and erosion/depositional trends associated with the selected design.

MODEL DEVELOPEMENT

MIKE 21C is a two-dimensional curvilinear grid model developed by DHI Water & Environment (DHI) to simulate changes in river morphology. The hydrodynamic model solves the vertically-integrated

equations of continuity and conservation of momentum (the Saint Venant equations) in two directions and includes descriptions for helical flow and vertical velocity profiles. These descriptions are important for simulating the physical processes associated with secondary flow in meandering systems. The morphological model, following calculation of bed material transport (bed load and suspended load), solves the equation for sediment continuity and simulates the development of the river bed due to erosion (bed and bank), deposition, and shoaling.

Two-dimensional models like MIKE 21C are applicable to sediment transport modeling of the Sacramento River. The available formulas in MIKE 21C can successfully describe transport of Sacramento River sediments ranging from fine to medium sands.

MODEL DOMAIN

The study reach, as shown by Figure 1, extends from River Mile[1] 56.7 near William Land Park downstream to RM 51.2 near Garcia Bend on the Sacramento River. However, the upstream boundary of the model was extended upstream of the Pioneer Memorial Bridge to RM 58.9 and the downstream boundary of the model was extended to the Freeport Bridge at RM 46.4 to move the model boundaries away from the study reach and minimize boundary-forcing effects, This corresponds to a 66,000 foot (or 12.5 mile) long reach over which channel and floodplain sedimentation were investigated. cbec developed the MIKE 21C model mesh to capture the complexity of the study reach (see Figure 2), resulting in a highly-detailed grid with typical element dimensions of 3 m wide by 9 m long (or 10 feet wide by 30 feet long). The model domain is represented by 450,260 computation cells.

BATHYMETRY AND TOPOGRAPHY

All bathymetric and topographic data for the project was provided to cbec by HDR. Bathymetric data for the river bed was derived from the California Department of Water Resources (DWR) Urban Levee Evaluation Program. This dataset was collected with multibeam technology in January of 2008. Topographic data for the levees and landward floodplains was derived from West Sacramento LiDAR data collected on February 7, 2007. Both of these datasets reference the horizontal projection of CA State Plane Zone 2 NAD83 feet and the vertical datum of NAVD 88 feet. Both of these datasets were reprojected / converted from feet to meters for use in the MIKE 21C model.

HYDRODYNAMIC BOUNDARY CONDITIONS

Hydrodynamic boundary conditions for the model domain for existing conditions were supplied to cbec by MBK for the 2-, 10-, 25-, 50-, 100-, and 200- year flood events using Feather River at Shanghai Bend centered hydrology derived from the Comprehensive Study (USACE, 2002). The boundary conditions were generated by MBK by routing the Feather River at Shanghai Bend centered hydrology through their HEC-RAS (RAS) model of the Sacramento River Flood Control Project (SRFCP) and extracting the

[1] River Mile (RM) as used in this study is based on stationing derived from the Comprehensive Study (USACE, 2002).

appropriate model output. The peak discharges and water surface elevations for these events are summarized in Table 1.

Table 1. Peak discharge and stage for modeled flood events

Recurrence Interval	Discharge at RM 58.9	Discharge at RM 58.9	Stage at RM 46.4	Stage at RM 46.4
(years)	(cms)	(cfs)	(m, NAVD 88)	(ft, NAVD 88)
2-year	2,335	82,448	6.31	20.7
10-year	2,768	97,762	7.13	23.4
25-year	3,142	110,970	7.9	25.9
50-year	3,236	114,294	8.1	26.6
100-year	3,338	117,876	8.28	27.2
200-year	3,728	131,658	8.87	29.1

HYDRAULIC ROUGHNESS

Existing conditions Manning's roughness coefficients were initially provided to cbec by MBK (see Table 2). MBK calibrated the roughness coefficients to the 100- and 200-year flood events using their RMA2 hydraulic model for the study reach. Initial roughness coefficients used in MIKE 21C ranged from 0.02 for the river bed to 0.05 for levee slopes to 0.1 for piers at boat docks and marinas. Bridge piers were not assigned roughness coefficients for the MIKE 21C model, which differed from the RMA2 model approach, but rather were treated as obstructions (see Figure 3). cbec further adjusted roughness elements associated with piers at boat docks and marinas to a refined scale appropriate for the higher resolution mesh in MIKE 21C. cbec also adjusted (or calibrated) the RMA2 roughness coefficients by globally scaling them for use in the MIKE 21C model such that the steady-state water surface profiles for the 100-year and 2-year flood events computed in MIKE 21C closely matched the 100-year water surface profile computed in RMA2 and observed 2-year water surface elevations.

Table 2. RMA2 Manning's roughness coefficients

Roughness Element	Manning's Roughness Coefficient (n)
Channel Bed	0.020
Bank Slope - Low Density	0.030
Bank Slope - Medium Density	0.035
Bank Slope / Floodplain - High Density	0.040
Bridge Piers / Marinas	0.100

SEDIMENT TRANSPORT THEORY

The Yang total load sediment transport formula was used to simulate sand transport in the Sacramento River. Selection of the Yang formula was based on the guidance provided in Yang and Huang (2001), which is more robust and accurate compared with other available sediment transport formulations. The Yang formula was used to simulate the transport of four (4) representative grain size classes in MIKE

21C. These grain size classes included very fine sand (d_{gm} = 0.09 mm; 0.062 to 0.125 mm), fine sand (d_{gm} = 0.17 mm; 0.125 to 0.25 mm), medium sand (d_{gm} = 0.31 mm; 0.25 to 0.5 mm), and coarse sand (d_{gm} = 0.51 mm; 0.5 to 1 mm). A limited number of size classes were selected based on the fairly uniform distribution of grain sizes within the system. Grain sizes less than 0.062 mm, which are typically considered to be washload and to not interact with the bed, were excluded from the sediment transport analyses.

SEDIMENT BOUNDARY CONDITIONS

Sediment transport boundary conditions for the MIKE 21C model for the 2-, 10-, 25-, 50-, 100-, 200-year flood events were derived from a suspended load rating curve developed from the USGS gage at Freeport (11447650) and from bed load and suspended load data collected during the 2010-2011 storm season (cbec, 2011). Figure 4 shows the suspended load rating curve derived from the Freeport gage as well as the data collected by cbec. Since sediment regimes tend to change over time due to changes in watershed land use and dam operations, only the last 20 years of data from the Freeport gage was selected as the best representation of existing conditions.

As stated prior, grain sizes less than 0.062 mm are considered to be washload and were excluded from the sediment transport calculations. As such, the proportion of the total suspended load attributed to this size class was subtracted from the incoming suspended load. This proportion was determined to be approximately 60 percent of the suspended loaded based on the particle size distribution analysis (see Figure 5) conducted under the 2010-2011 data collection effort (cbec, 2011).

Bed load measurements were also conducted during the 2010-2011 storm season (cbec, 2011). These data indicate that on average, the bed load is approximately 12 percent of the total load when compared to the USGS rating curve developed for suspended load. Using this relationship, bed load discharge was calculated for the n-year flood events.

BED MATERIAL AND REPRESENTATIVE GRAIN SIZE

The grainsize distributions for the suspended and bed load were defined from measurements taken during the 2010-2011 field study (cbec, 2011). Based on the results of this study, the representative grain size of the bed material and the relative distribution between the incoming bed load and suspended load are provided in Table 3.

Table 3. Representative grain size and relative distribution used as model input in MIKE 21C

Fraction	Grain Size (mm)	Bed Material (% finer)	Bed Load	Suspended Load
1	0.09	1%	0%	100%
2	0.17	3%	10%	90%
3	0.31	30%	80%	20%
4	0.51	80%	90%	10%

BED THICKNESS AND BANK ERODIBILITY

The active bed material thickness was arbitrarily set at 15 meters (50 feet) for the channel as this was considered an ample scour limit. Geomorphic field reconnaissance indicated that a majority of the banks within the project reach are armored. The extent of the armoring was estimated to be approximately 1.5 to 2.4 meters (5 to 8 feet) above the bank toe based on a limited number of field observations. Based on this assumption, bank erodibility was limited to the lower 1.5 to 2.4 meters (5 to 8 feet) of the bank above the toe, thereby preventing any erosion and/or migration of the bank or levee in the model. The bed material thickness at the toe was also set to 0.5 meters (1.6 feet) as a transition from the moveable bed to the armored banks.

MODEL ASSUMPTIONS AND LIMITATIONS

The preparation and use of the MIKE 21C model and results for existing conditions include the following assumptions and limitations:

1. All simulations utilize synthetic hydrographs derived from Comprehensive Study (USACE, 2002) hydrology as provided by MBK based on Feather River at Shanghai Bend storm centering.
2. There is the potential that the channel bathymetry may have changed since the time of the survey in 2008.
3. Detailed mapping of rip rap extents was not available to classify bank erodibility at the toe for every segment of the river. However, a majority of the river banks are armored, which was used to globally describe the moveable bed conditions at the toes.
4. MIKE 21C is being used as a tool for assessing potential geomorphic change, sediment transport results are not intended to be taken as absolute and conclusions drawn are based on short-duration synthetic flood hydrographs.
5. All simulations rely on the Yang sediment transport formula for sand. Equation selection was based on the findings in Yang and Huang (2001) that Yang's formula for sand transport is more robust and accurate compared with other available sediment transport formulations.
6. MIKE 21C was calibrated for hydrodynamics by adjusting Manning’s roughness coefficients such that the predicted water surface profile closely matched the water surface profile of the calibrated RMA2 model. MIKE 21C was not calibrated for sediment transport and geomorphic change. However, the MIKE 21C model did rely upon measured bed material and sediment transport data collected by the USGS and cbec.
7. The USGS suspended load data was adjusted for washload. Washload was excluded from the sediment transport analyses.

RESULTS

HYDRAULIC MODEL CALIBRATION

Calibration of the hydrodynamic model was performed for both the 100-year (3,358 cms [118,587 cfs])[2] flood event and an observed 2-year (2,086 cms [73,670 cfs]) flood event using standard techniques. Calibration was conducted for the 100-year flood event by comparing the water surface profile between MIKE 21C model predictions and those computed using the RMA2 model. The MIKE 21C model was run for two days at a constant discharge to approximate the steady-state approach utilized within RMA2. With this approach, it was necessary to increase Manning's roughness coefficients uniformly by 33.3% from the initial values to compensate for differences in model resolution, discretization, and compounded model assumptions. This increase corresponds to a change in bed roughness from the base value of 0.02 to 0.027, both of which are within acceptable ranges for meandering sand bed channels (Chow, 1959). Calibration results for the 100-year flood event are shown in Figure 6 and demonstrate that the match to the RMA2 and RAS water surface profiles.

Calibration was also performed for an observed 2-year flood event by comparing water surface elevations between MIKE 21C model predictions and the corresponding stages observed during the 2010-2011 flood season. On December 23, 2011, cbec measured a discharge of 2,086 cms (73,670 cfs) at RM 58.9, while stage recorders measured the corresponding water surface elevations of 22.5 and 20.5 feet at RM 57.6 and RM 52.5, respectively (cbec, 2011). With these data and the corresponding stage recorded by the USGS gage at Freeport, a constant discharge was simulated in MIKE 21C for a duration of 2 days. In order to match the observed water surface elevations, it was necessary to increase Manning's roughness coefficients uniformly by 39.8% from the initial values provide by MBK. This increase corresponds to a change in bed roughness from the base value of 0.02 to 0.028, both of which are within acceptable ranges for meandering sand bed channels (Chow, 1959). This would suggest that the Manning's roughness coefficients for a 2-year flood event are approximately 6.5% higher than that of the 100-year flood event. The calibration results for the 2-year flood event are shown in Figure 7 and demonstrate that the absolute errors between predicted and observed water surface elevations are less than 0.02 meters (0.07 feet). This magnitude of calibration error is within acceptable limits considering the accuracy of model predictions and the water level data collection.

EXISTING CONDITIONS

Under existing conditions (i.e., no levee setbacks), the bed of the Sacramento River through the study reach is effectively vertically-stable during the 2- through 200-year recurrence interval flood events. Figures 8 through 13 display bed level change for these events. Erosional and depositional features exist within meander bends, in reaches where there is a significant change in cross sectional area (constricted reaches), and around structures that induce local scour. These features represent a net movement of

[2] This discharge corresponds to the hydraulic impact analysis (HIA) condition simulated by MBK for the 100-year event. Design discharges with Shanghai centered hydrology were utilized for the unsteady simulations as presented in Table 1.

bed material from one location to another over the course of given flood event. For example, sediment is typically eroded from the outside of meander bend where bed shear stress is high and is then re-deposited on the inside of that bend within the bar area due to secondary or helical flow. By contrast, within straight reaches, where fairly uniform flow fields exist, there is minimal erosion or deposition. Over longer periods of time, and with the occurrence of additional lower magnitude events, these features are typically redistributed resulting in an equilibrium condition. This equilibrium condition is further corroborated by the results shown in Table 4, which demonstrate that there is minimal change in the average bed level when the net change in bed volume is distributed over entire area of the study reach. Also, due to the existing revetment within the project reach, the channel is laterally confined and lateral migration has been largely arrested. This is correspondingly represented in the model per the model input parameters.

Table 4. Net bed change within the model domain

Recurrence Interval (years)	Net Change in Bed Volume (m^3)	Net Change in Bed Volume (yd^3)	Average Change in Bed Level (m)	Average Change in Bed Level (ft)
2-year	-108,543	-141,969	-0.03	-0.1
10-year	-115,263	-150,759	-0.03	-0.1
25-year	-129,704	-169,646	-0.04	-0.1
50-year	-480,315	-628,229	-0.13	-0.4
100-year	-270,779	-354,166	-0.10	-0.3
200-year	-285,401	-373,291	-0.10	-0.3

Bed shear stress is a measure of erosive force described as a function of velocity, depth, and gravitational forces and is often used as a measure of a river's ability to entrain bed material. When the shear stress equals the critical shear stress of the riverbed material or floodplain soil characteristics, the channel or floodplain will likely be in equilibrium. When shear stress is excessively greater than the critical shear stress, channel degradation may result. The maximum bed shear stress over the course the hydrograph has been calculated for the 2- and 100-year flood events and is displayed in Figures 15 and 16. These values range from 0 to 63 N/m^2 for the 2-year flood event and 0 to 115 N/m^2 for the 100-year flood event. These values are positively correlated with areas of high velocity and high bed roughness. Shear stresses can be compared with the list of allowable shear stresses for stream channel materials shown in Table 5 to aid in the understanding of mobility thresholds for this system. These results generally show that the levee slopes and rip rap are not erodible (notwithstanding toe failure).

Table 5. Allowable velocities and shear stresses for streambank materials (from Fischenich, 2001)

Boundary Category	Boundary Type	Permissible Shear Stress (lb/sq ft)	Permissible Shear Stress (N/M^2)	Permissible Velocity (ft/sec)	Permissible Velocity (m/sec)	Citations
Soils	Fine colloidal sand	0.02 - 0.03	0.96 - 1.44	1.5	0.4572	*A*
	Sandy loam (noncolloidal)	0.03 - 0.04	1.44 - 1.91	1.75	0.5334	*A*
	Alluvial silt (noncolloidal)	0.045 - 0.05	2.2 - 2.4	2	0.6096	*A*
	Silty loam (noncolloidal)	0.045 - 0.05	2.2 - 2.5	1.75 - 2.25	0.5334 - 0.6858	*A*
	Firm loam	0.075	3.6	2.5	0.7620	*A*
	Fine gravels	0.075	3.6	2.5	0.7620	*A*
	Stiff clay	0.26	12	3 - 4.5	0.9144 - 1.3716	*A,F*
	Alluvial silt (colloidal)	0.26	12	3.8	1.143	*A*
	Graded loam to cobbles	0.38	18	3.8	1.143	*A*
	Graded silts to cobbles	0.43	21	4	1.2192	*A*
	Shales and hardpan	0.67	32	6	1.8288	*A*
Gravel/Cobble	1 - in	0.33	16	2.5 - 5	0.762 - 1.524	*A*
	2 - in	0.67	32	3.0 - 6.0	0.9144 - 1.8288	*A*
	6 - in	2	96	4.0 - 7.5	1.2192 - 2.286	*A*
	12 - in	4	191	5.5 - 12.0	1.6764 - 3.6576	*A*
Vegetation	Class A turf	3.7	177	6.0 - 8.0	1.8288 - 2.4384	*E,N*
	Class B turf	2	96	4.7 - 7.0	1.2192 - 2.1336	*E,N*
	Class C turf	1	48	3.5	1.0668	*E,N*
	Long native grasses	1.2 - 1.7	81	4.0 - 6.0	1.2192 - 1.8288	*G,H,L,N*
	Short native and bunch grasses	0.7 - 0.95	33 - 45	3.0 - 4.0	0.9144 - 1.2192	*G,H,L,N*
	Reed plantings	0.1 - 0.6	5.0 - 29	N/A	N/A	*E,N*
	Hardwood tree plantings	0.41 - 2.5	20 - 120	N/A	N/A	*E,N*
Temporary Degradable RECP's	Jute net	0.45	22	1 - 2.5	0.3048 - 0.762	*E,H,M*
	Straw with net	1.5 - 1.65	72 - 79	1.0 - 3.0	0.3048 - 0.9144	*E,H,M*
	Coconut fiber with net	2.25	108	3.0 - 4.0	0.9144 - 1.2192	*E,M*
	Fiberglass roving	2	96	2.5 - 7.0	0.762 - 2.1336	*E,H,M*
Non - Degradable RECP's	Unvegetated	3	144	5.0 - 7.0	1.524 - 2.1336	*E,G,M*
	Partially established	4.0 - 6.0	191 - 287	7.5 - 15.0	2.286 - 4.572	*E,G,M*
	Fully vegetated	8	383	8.0 - 21.0	2.4384 - 6.4008	*F,L,M*
Riprap	6 - in d50	2.5	120	5.0 - 10.0	1.524 - 3.048	*H*
	9 - in d50	3.8	182	7.0 - 11.0	2.1336 - 3.3528	*H*
	12 - in d50	5.1	244	10.0 - 13.0	3.048 - 3.9624	*H*
	18 - in d50	7.6	364	12.0 - 16.0	3.6576 - 4.8768	*H*
	24 - in d50	10.1	483	14.0 - 18.0	4.2672 - 5.4864	*E*
Soil Bioengineering	Wattles	0.2 - 1.0	10.0 - 48	3	0.9144	*C,I,J,N*
	Reed fascine	0.6 - 1.25	29 - 60	5	1.524	*E*
	Coir roll	3.0 - 5.0	144 -4239	8	2.4384	*E,M,N*
	Vegetated coir mat	4.0 - 8.0	191 - 383	9.5	2.8956	*E,M,N*
	Live brush mattress (original)	0.4 - 4.1	19 - 196	4	1.2192	*B,E,I*
	Live brush mattress (grown)	3.90 - 8.2	187 - 392	12	3.6576	*B,C,E,I,N*
	Brush Layering (initial/grown)	0.4 - 6.25	19 - 299	12	3.6576	*E,I,N*
	Live fascine	1.25 - 3.10	60 - 148	6.0 - 8.0	1.8288 - 2.4384	*C,E,I,J*
	Live willow stakes	2.10 - 3.10	100 - 148	3.0 - 10.0	0.9144 - 3.048	*E,N,O*
Hard Surfacing	Gabions	10	478	14.0 - 19.0	4.2672 - 5.7912	*D*
	Concrete	12.5	598	>18	>5.4864	*H*

The maximum velocity over the course of the hydrograph has been calculated for the 2- and 100-year flood events and is displayed in Figures 16 and 17. These values typically range from 0.5 m/s to 1.6 m/s (1.6 to 5.2 ft/s) for the 2-year flood event and 0.5 to 2.1 m/s (1.6 to 6.9 ft/s) for the 100-year flood event.

CONCLUSIONS

A detailed MIKE 21C morphological model of the Sacramento River from RM 58.9 upstream of Pioneer Memorial Bridge to RM 46.4 at the Freeport Bridge was developed for existing conditions and successfully calibrated for hydrodynamics. The sediment transport model was not calibrated, but was developed based on measured data for bed material, bed load, and suspended load. Preliminary model results for existing conditions indicate that the bed of the Sacramento River within the project reach is for the most part vertically stable. Erosion and depositional patterns shown in the model do exist within areas where such patterns are typically expected to occur (i.e., meander bends) following significant flood events. These results are consistent with long-term trends, which suggest that the Sacramento River in the vicinity of the project reach is overall in equilibrium with the existing sediment regime. A recent study (Hall, et. al. 2010) showed that this reach of the Sacramento River is slightly degradational based on long terms simulations showing 0.02 feet of erosion over 50 years and 0.1 feet of erosion over 100 years. However, since these depths of erosion are so small for the time horizons predicted, the predictions are considered to be within accepted uncertainties for sediment transport modeling. The preliminary findings presented here are intended to serve as an interim deliverable. The final deliverable will include simulations of the preferred setback design alternative with analyses that will examine the relative project impacts on channel hydraulics and erosional/depositional trends associated with the selected design.

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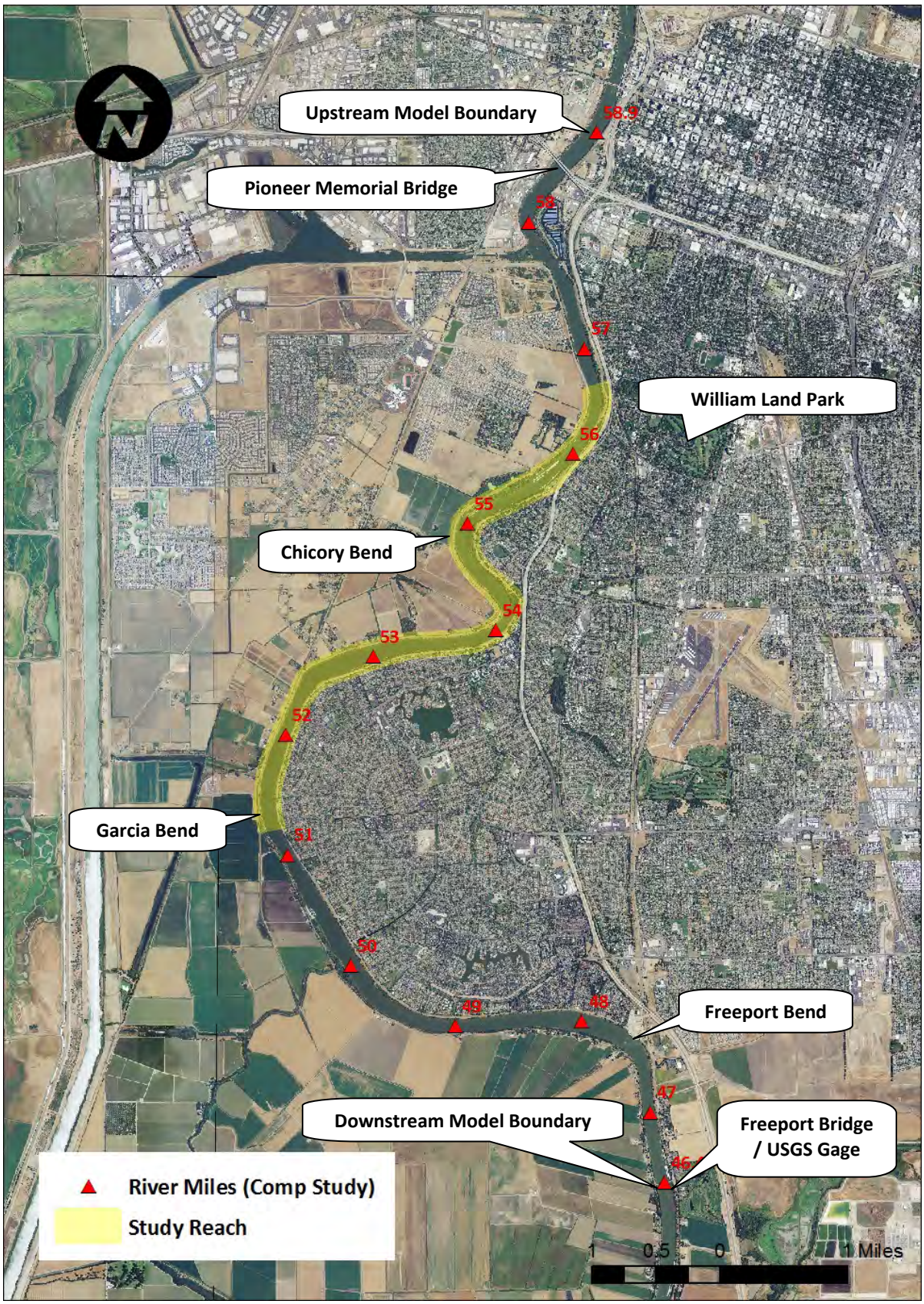


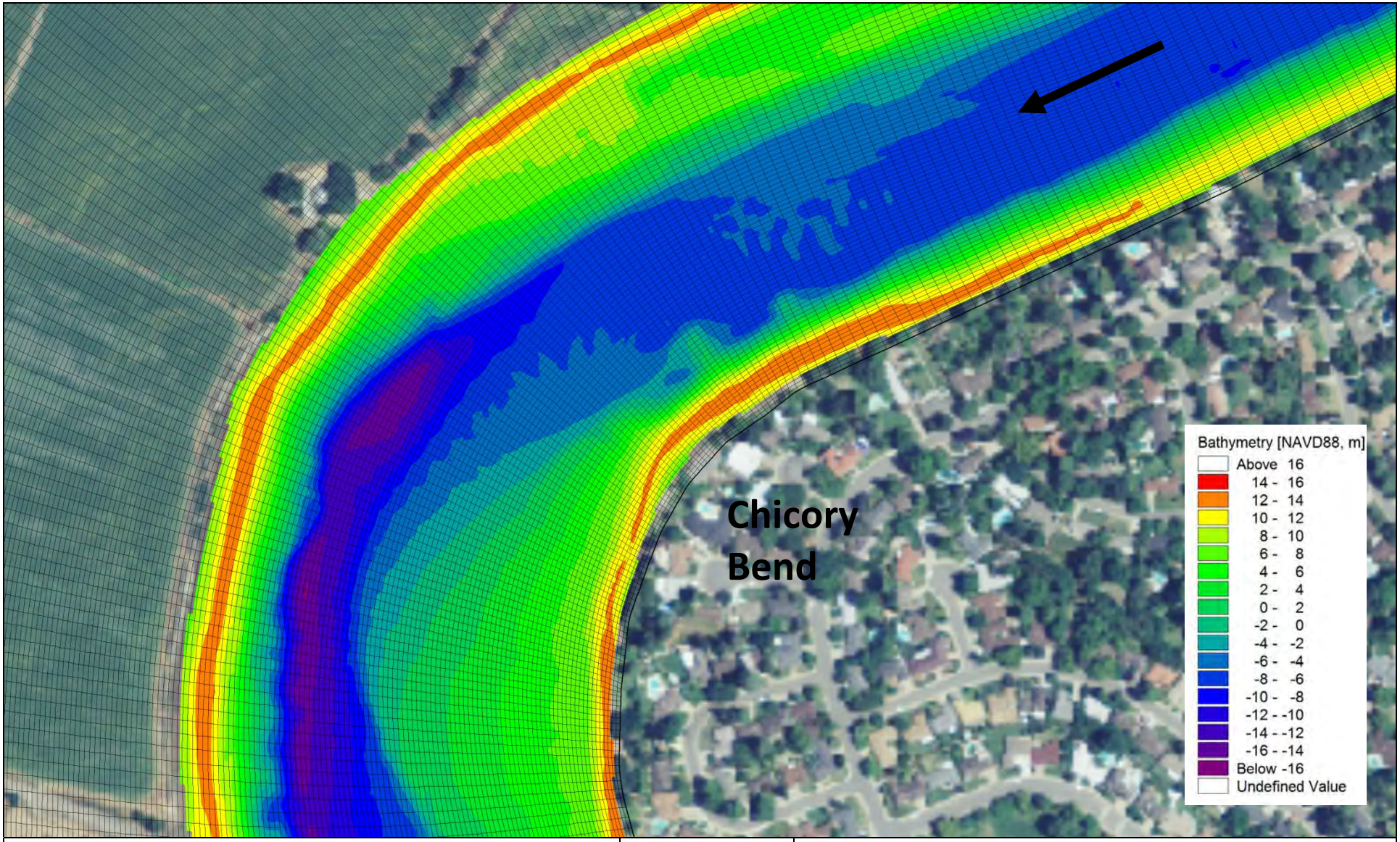
Notes:

West Sacramento Southport EIP Task Order 3

MIKE 21C existing condition model domain

Project No. 11-11013	Created By: JS	**Figure 1**

C:\JohnS\Projects\11-1013_West_Sac_TO3\Reporting\figs\Fig1_Site_Layout.docx
11/7/2011



Notes:

West Sacramento Southport EIP Task Order 3

Example of model grid and bathymetry

Project No. 11-1013	Created By: AMS	**Figure 2**

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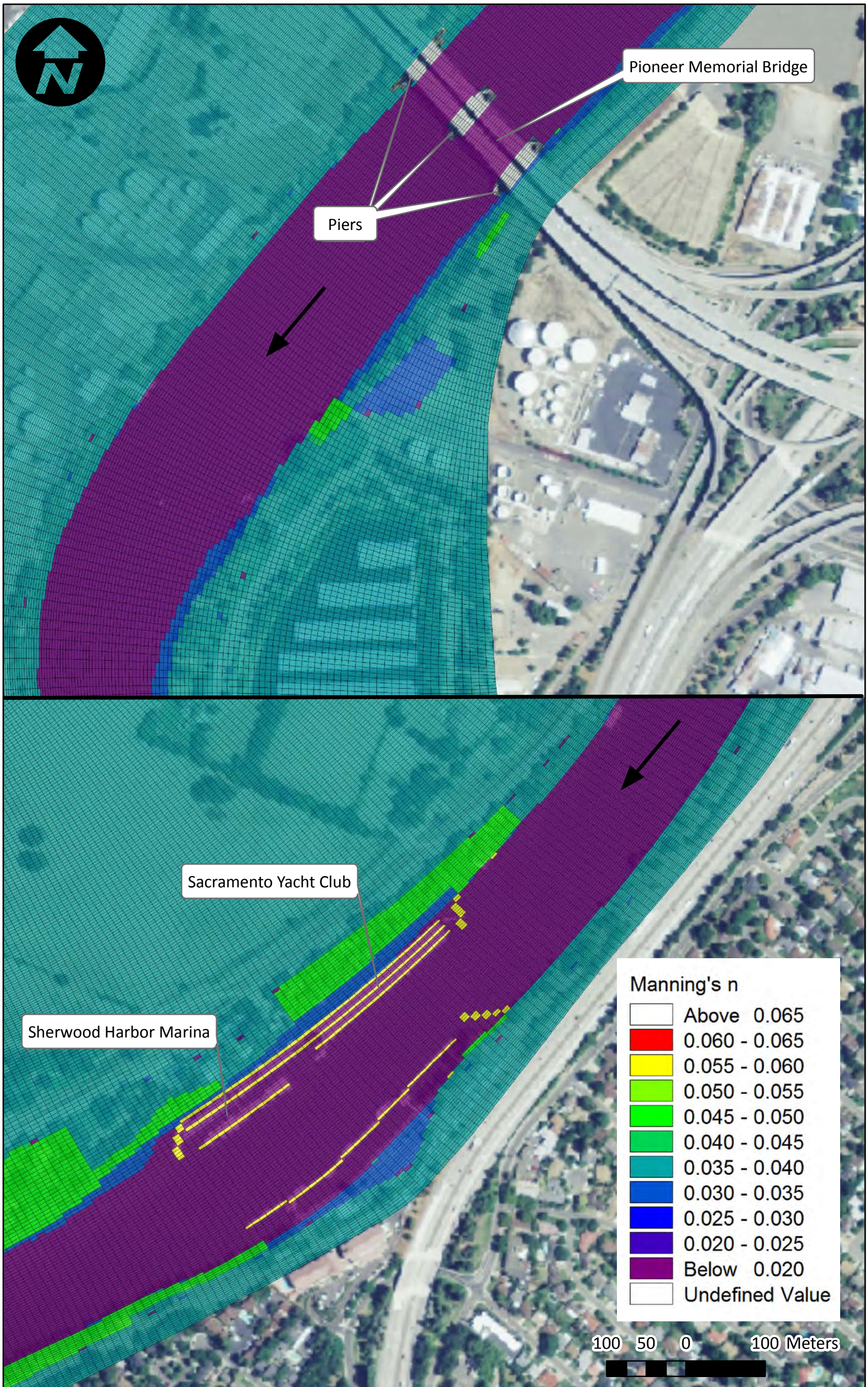
11/7/2011



Notes:

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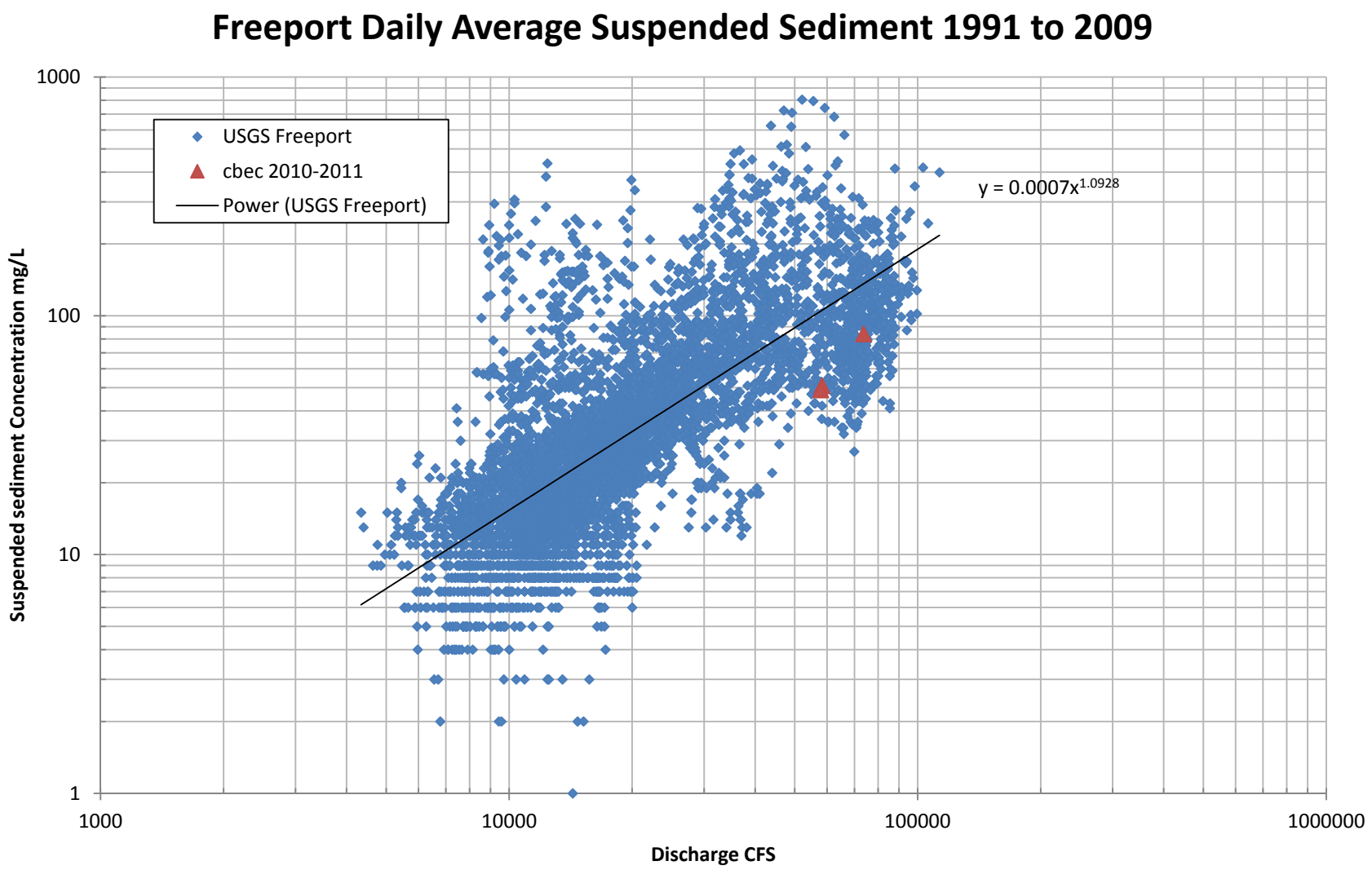
West Sacramento Southport EIP Task Order 3

Pre-calibrated Manning's n values

Project No. 11-1013 | Created By: AMS | **Figure 3**



Notes:

West Sacramento Southport EIP Task Order 3

Suspended Sediment Rating Curve at Freeport

Project No. 11-1013	Created By: JS	**Figure 4**

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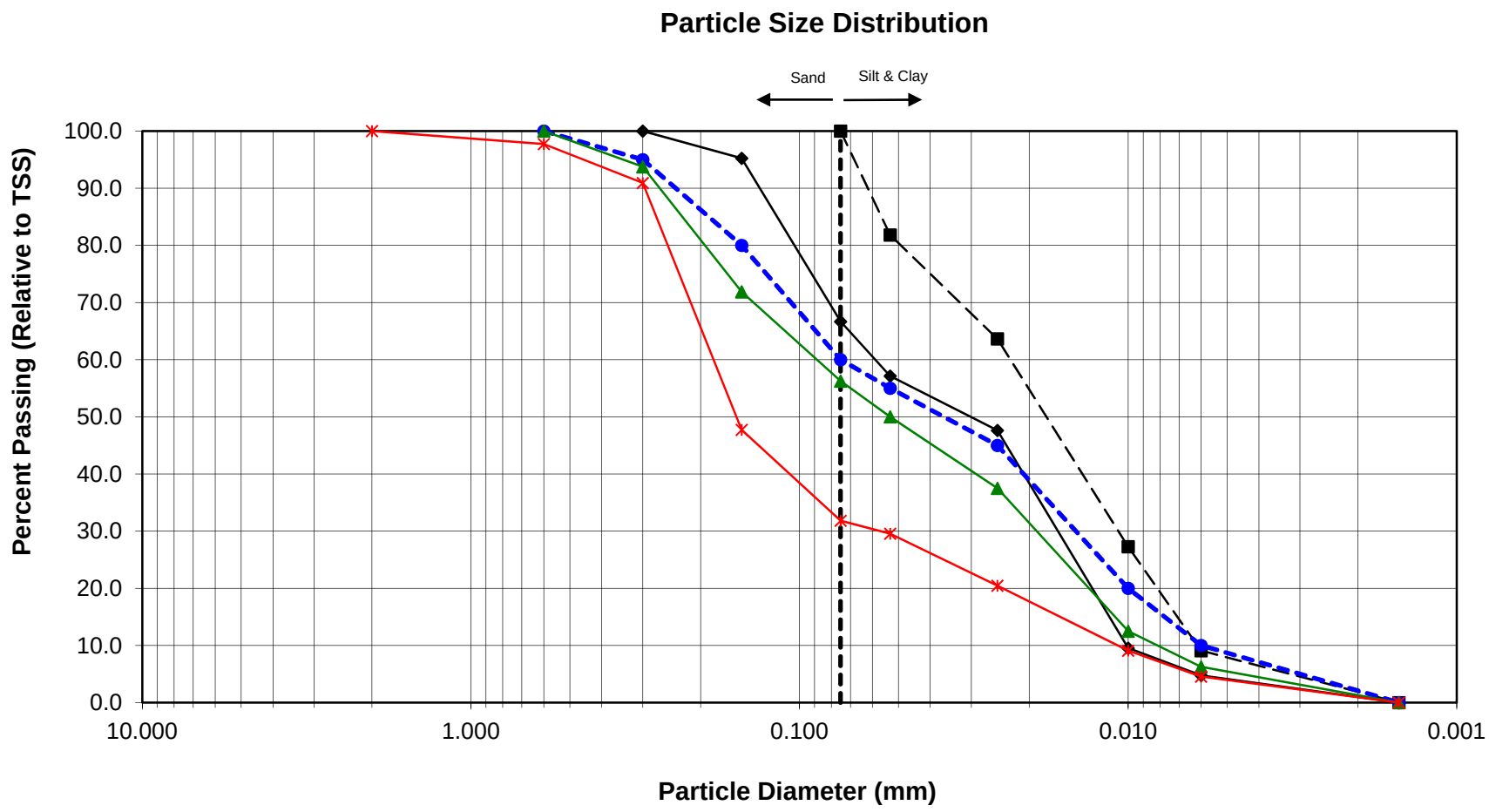
11/7/2011



Notes:

West Sacramento Southport EIP Task Order 3

Suspended Sediment Particle Size Distribution

Project No. 11-1013	Created By: JS	**Figure 5**

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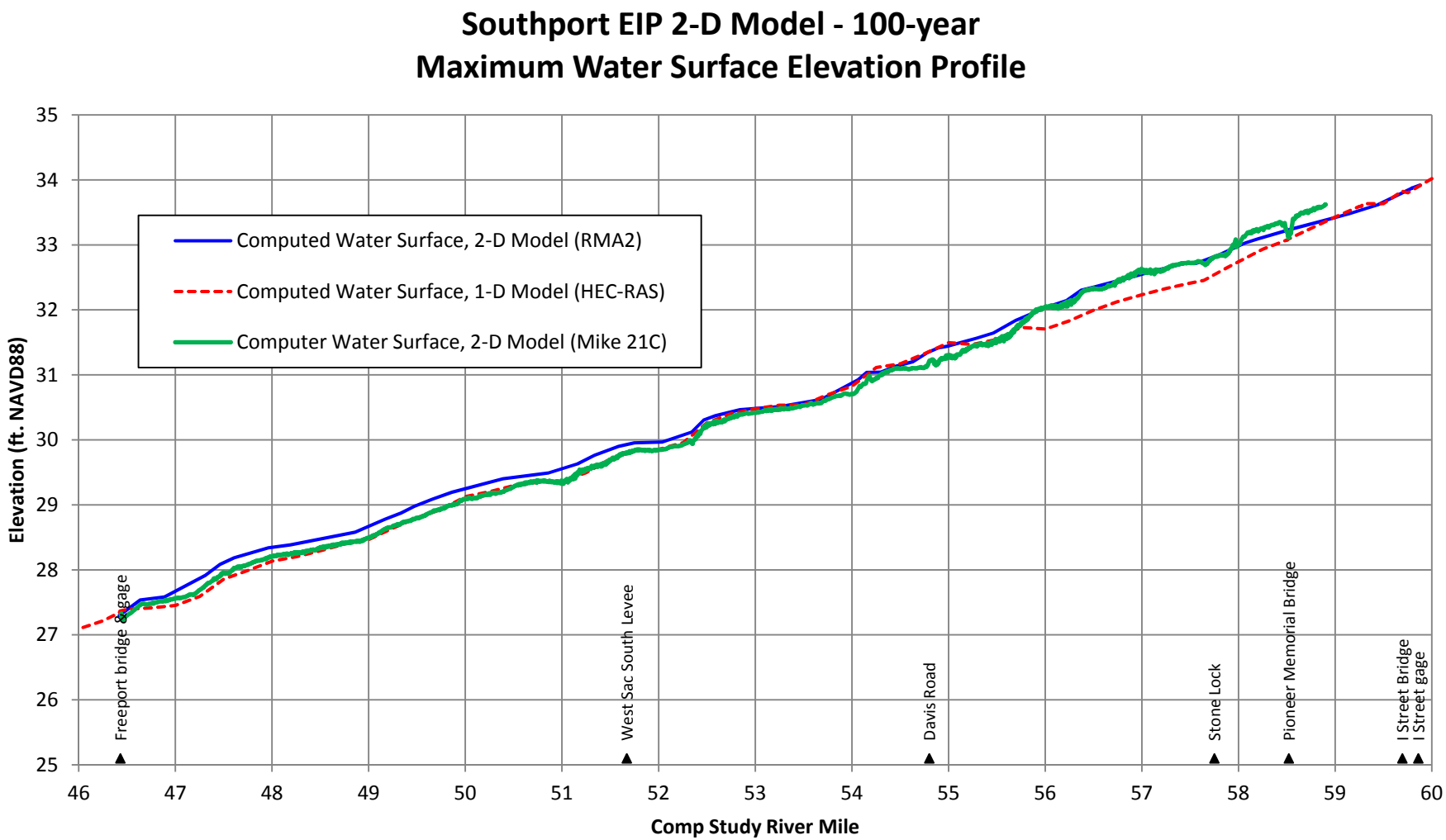
11/7/2011



Notes:

West Sacramento Southport EIP Task Order 3

Calibration Results: 100-year event

Project No. 11-1013	Created By: JS	**Figure 6**

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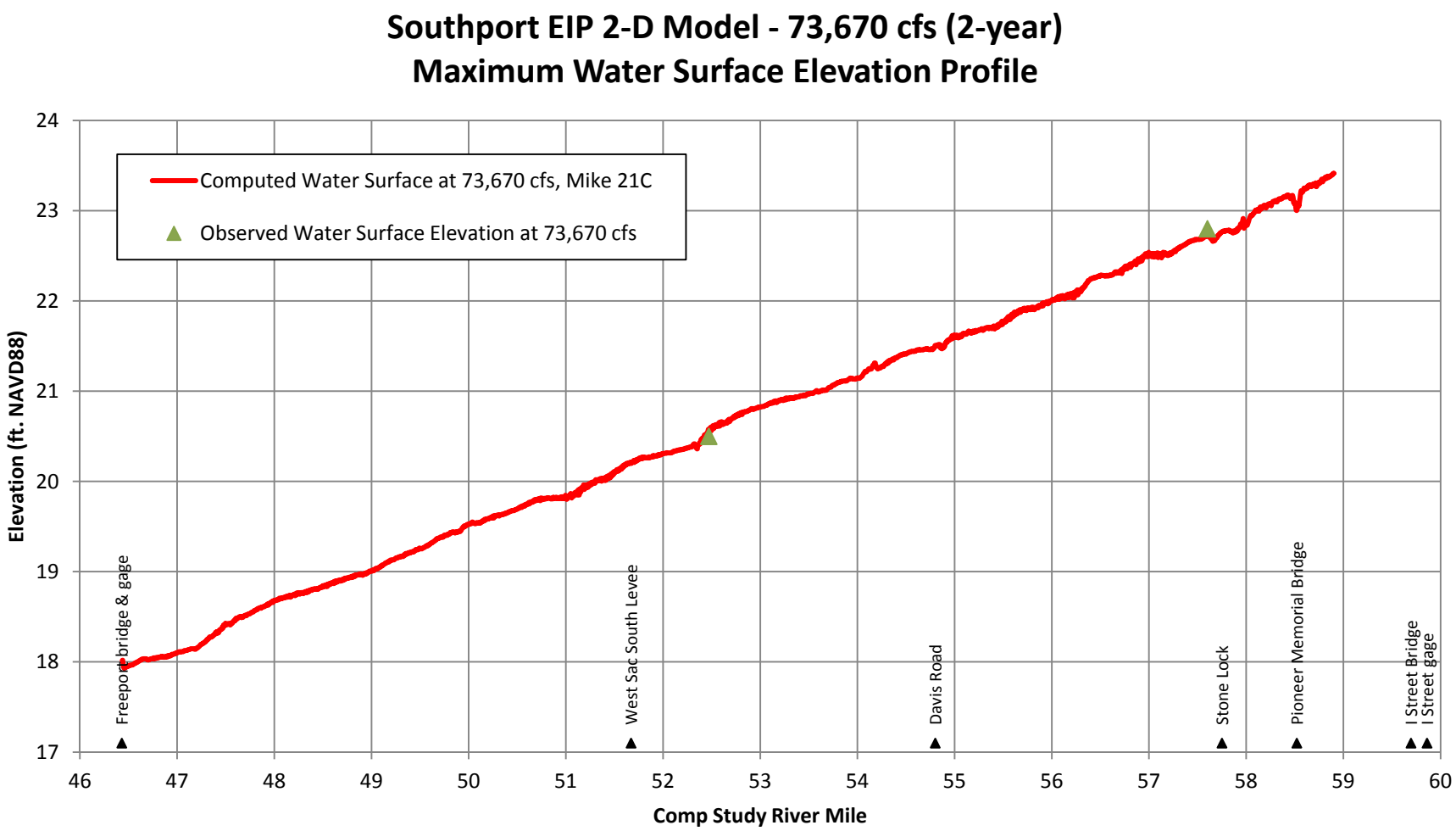
11/7/2011



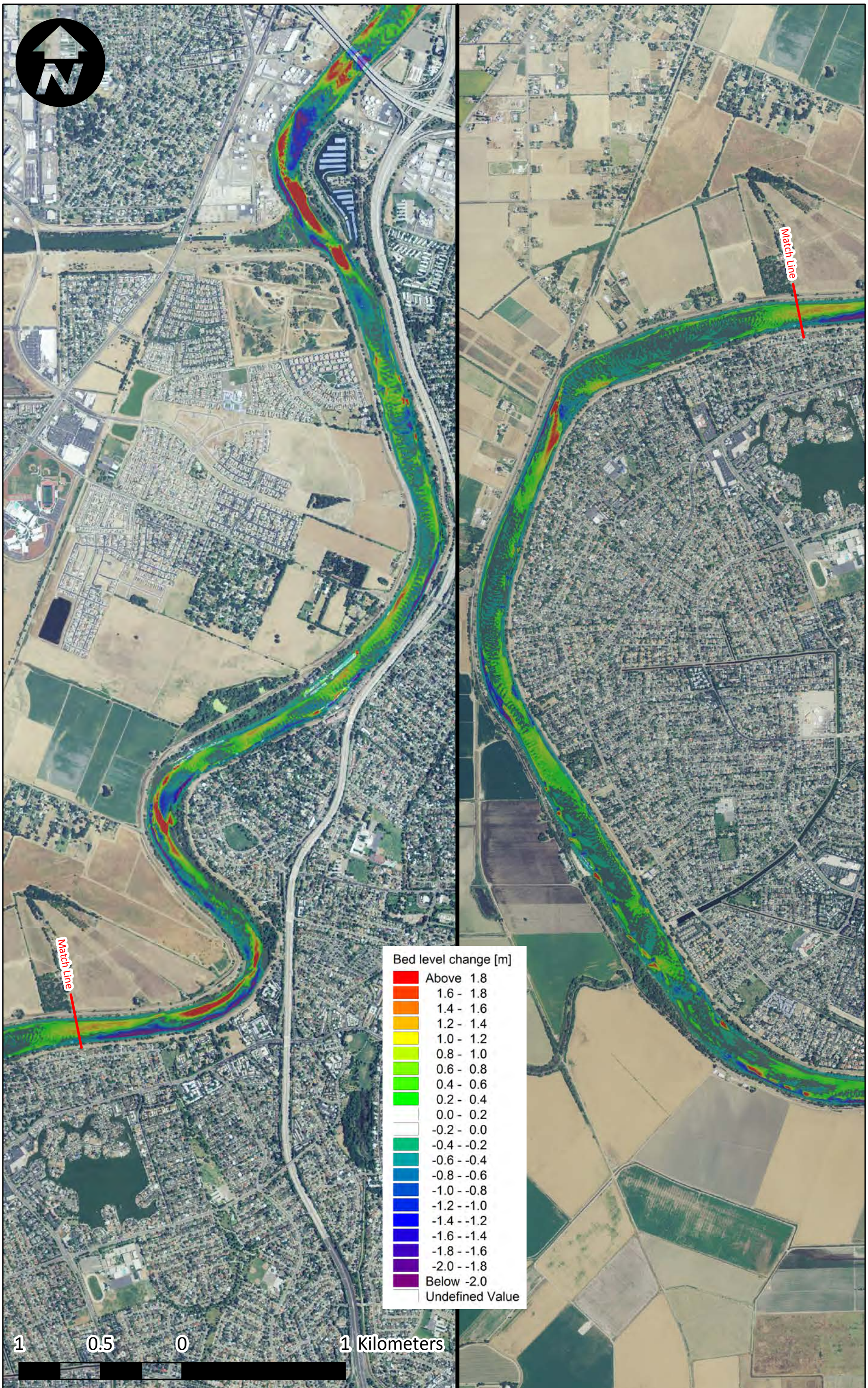
Notes:

West Sacramento Southport EIP Task Order 3

Calibration results: 73,670 cfs (2-year)

Project No. 11-1013	Created By: JS	**Figure 7**

C:\JohnS\Projects\11-1013_West_Sac_TO3\Reporting\figs\Fig7_Calibration_2yr.docx
11/7/2011



Notes:

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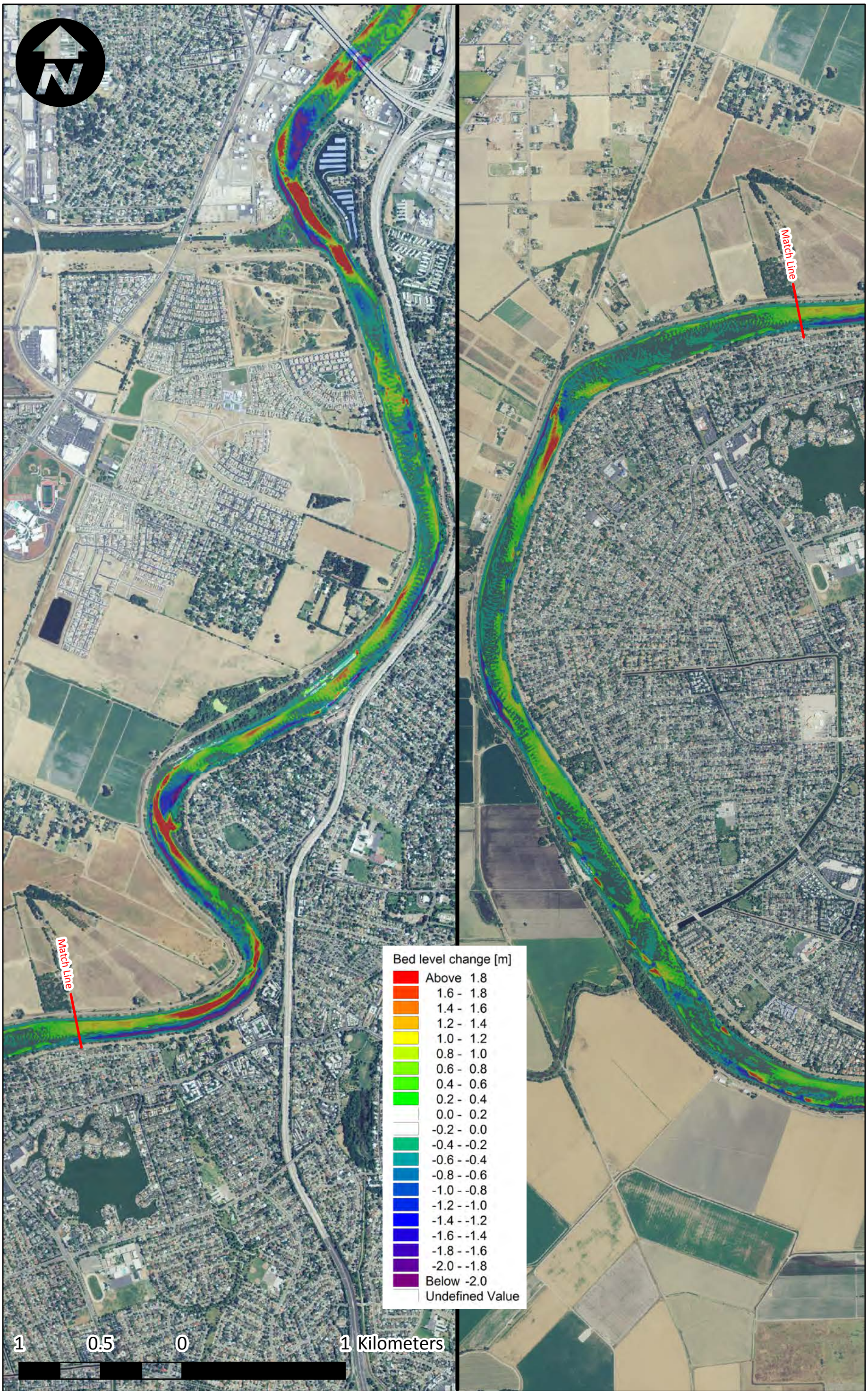
West Sacramento Southport EIP Task Order 3

2-year event bed level change

Project No. 11-1013

Created By: AMS

Figure 8



Notes:

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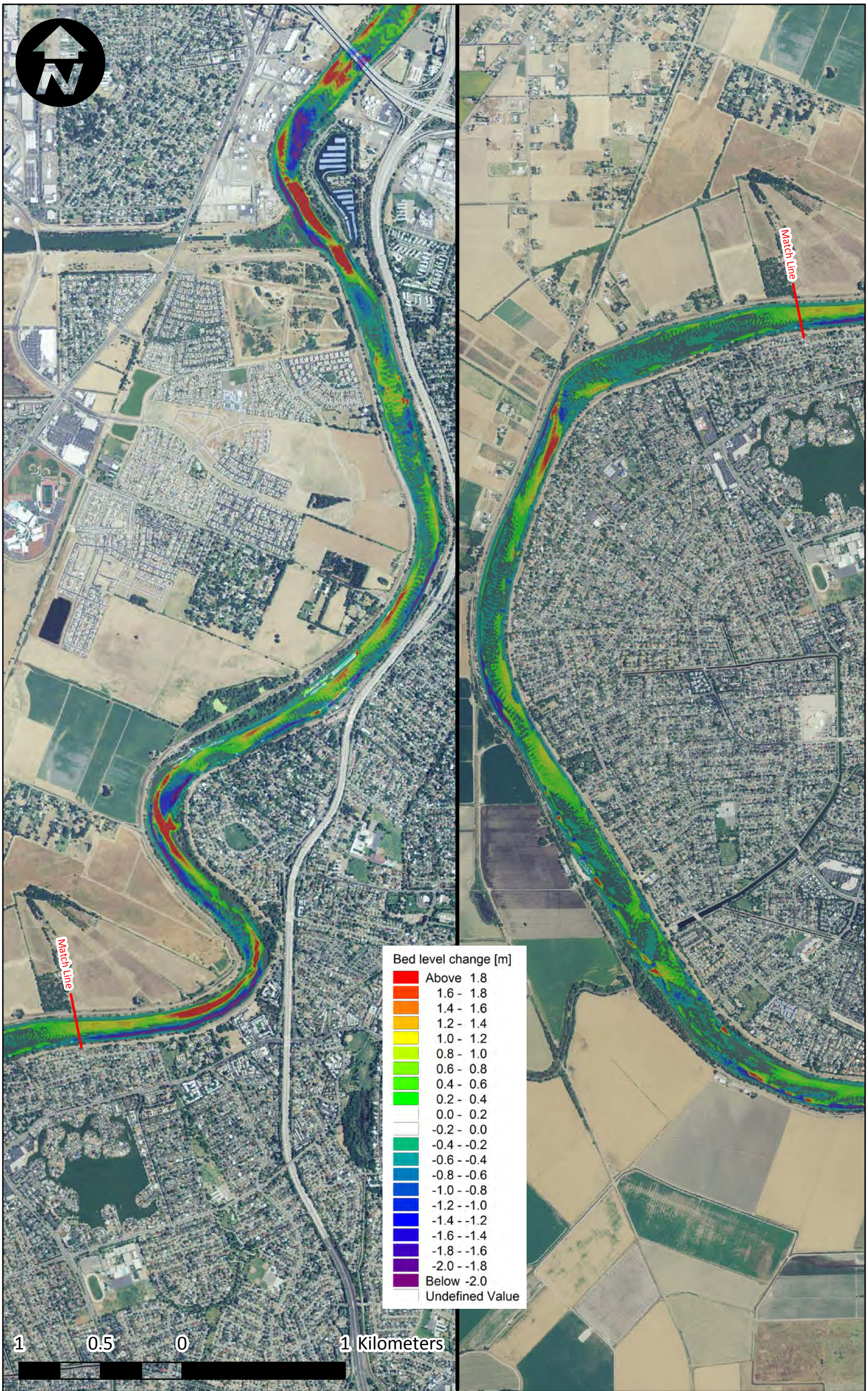
West Sacramento Southport EIP Task Order 3

10-year event bed level change

Project No. 11-1013 | Created By: AMS | **Figure 9**



Notes:

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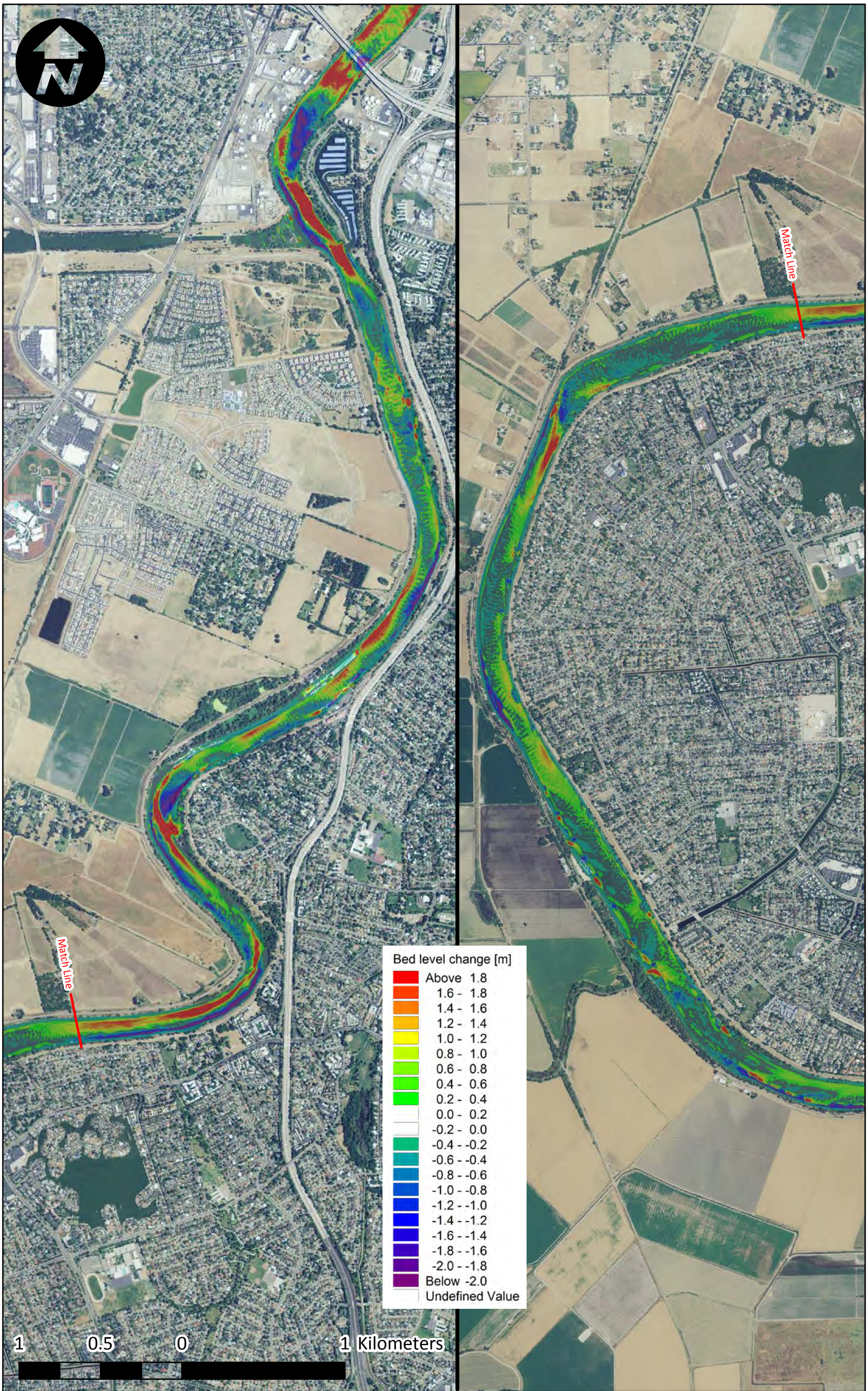
West Sacramento Southport EIP Task Order 3

25-year event bed level change

Project No. 11-1013 | Created By: AMS | **Figure 10**



Notes:

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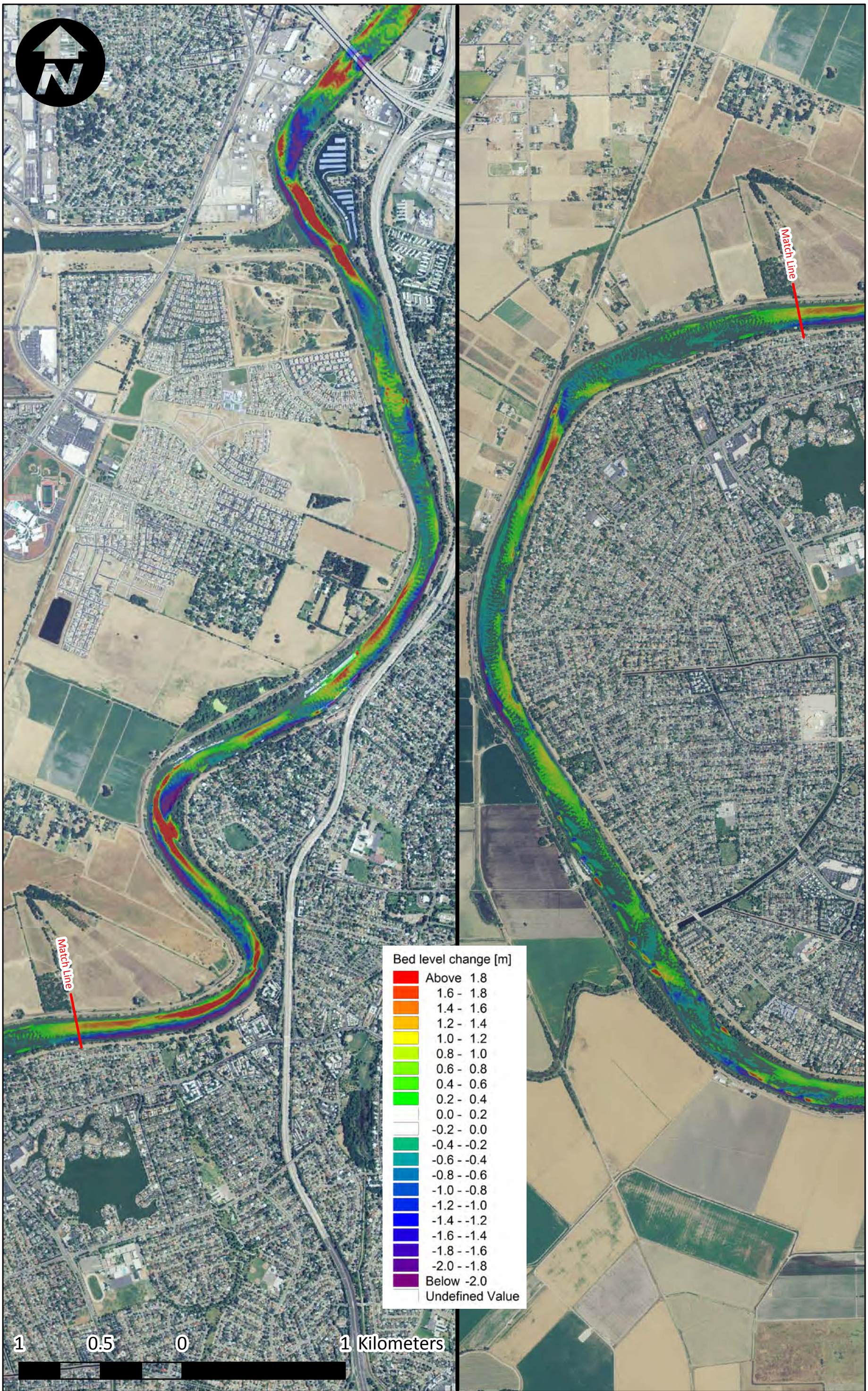
West Sacramento Southport EIP Task Order 3

50-year event bed level change

Project No. 11-1013 | Created By: AMS | **Figure 11**



Notes:

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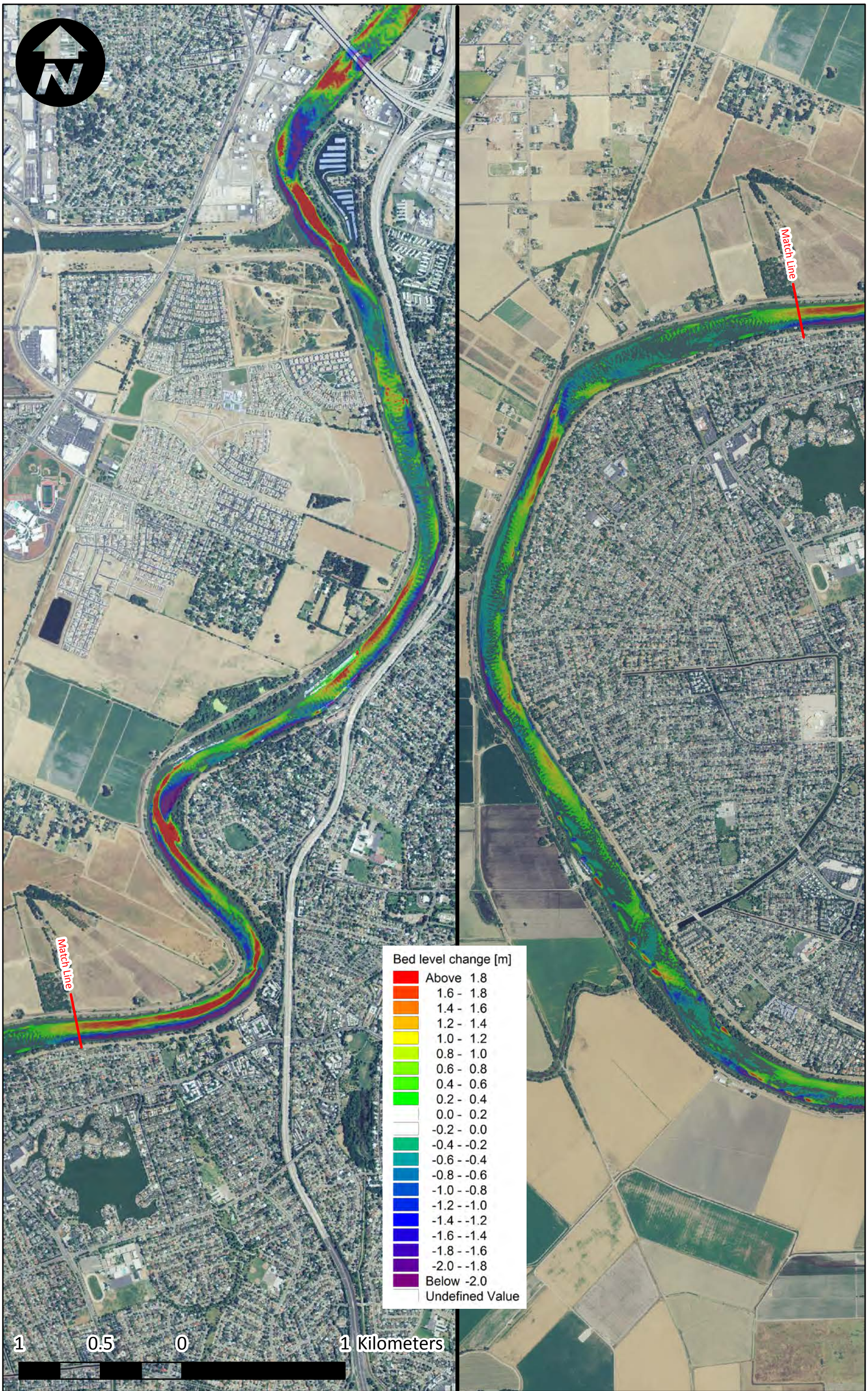
West Sacramento Southport EIP Task Order 3

100-year event bed level change

Project No. 11-1013 | Created By: AMS | **Figure 12**



Notes:

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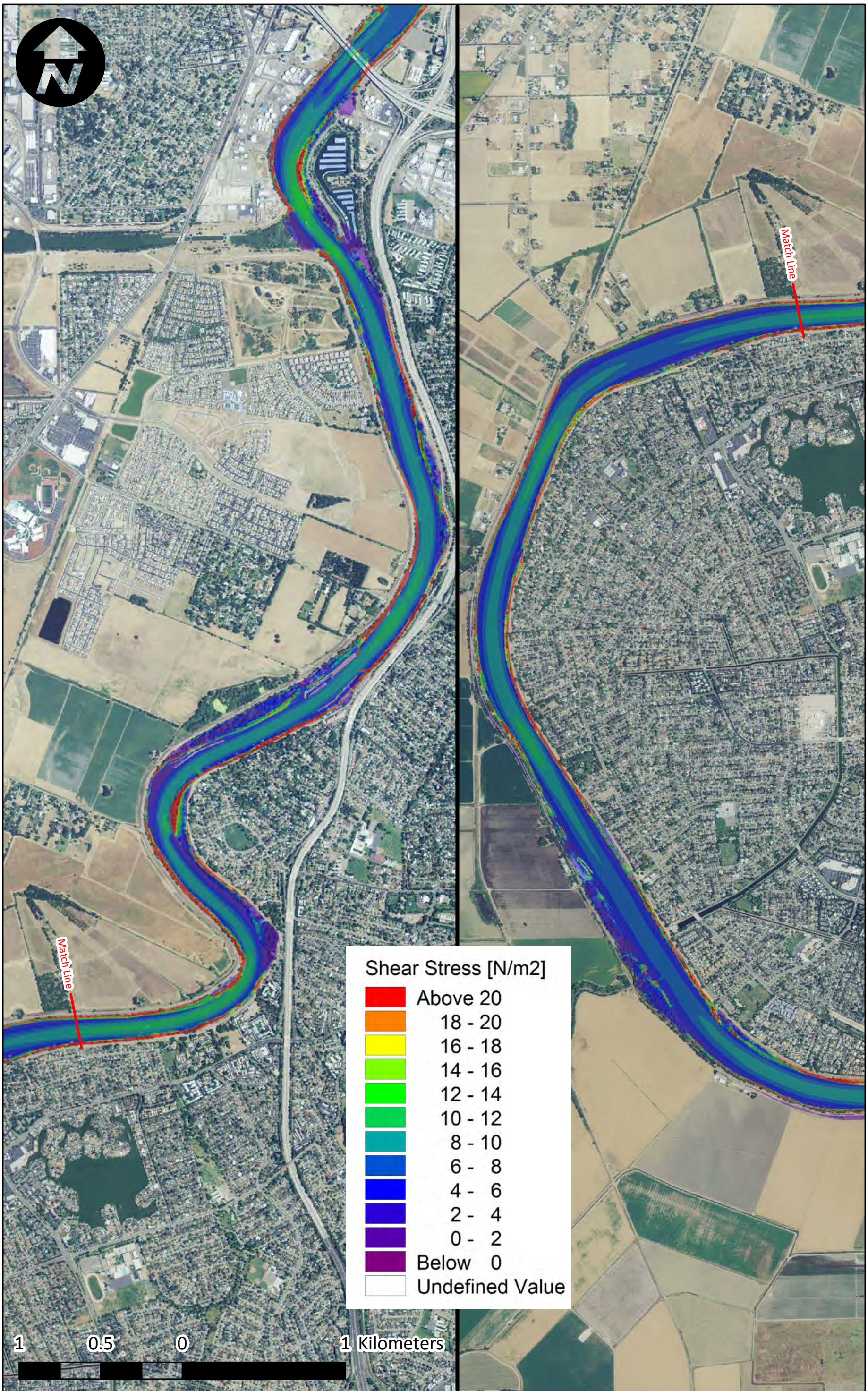
West Sacramento Southport EIP Task Order 3

200-year event bed level change

Project No. 11-1013 | Created By: AMS | **Figure 13**



Notes:

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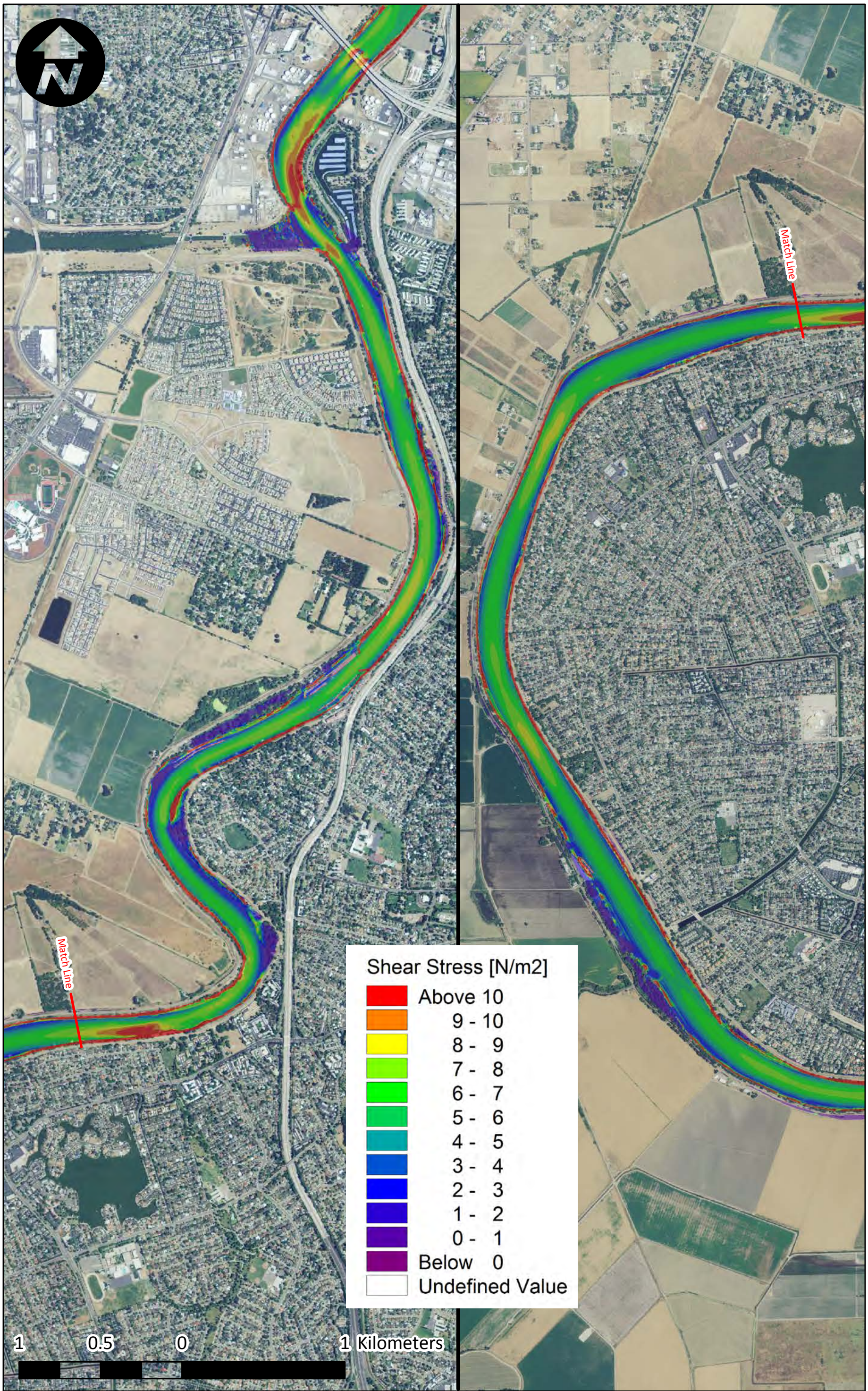
West Sacramento Southport EIP Task Order 3

100-year event maximum bed shear stress

Project No. 11-1013 | Created By: AMS | **Figure 14**



Notes:

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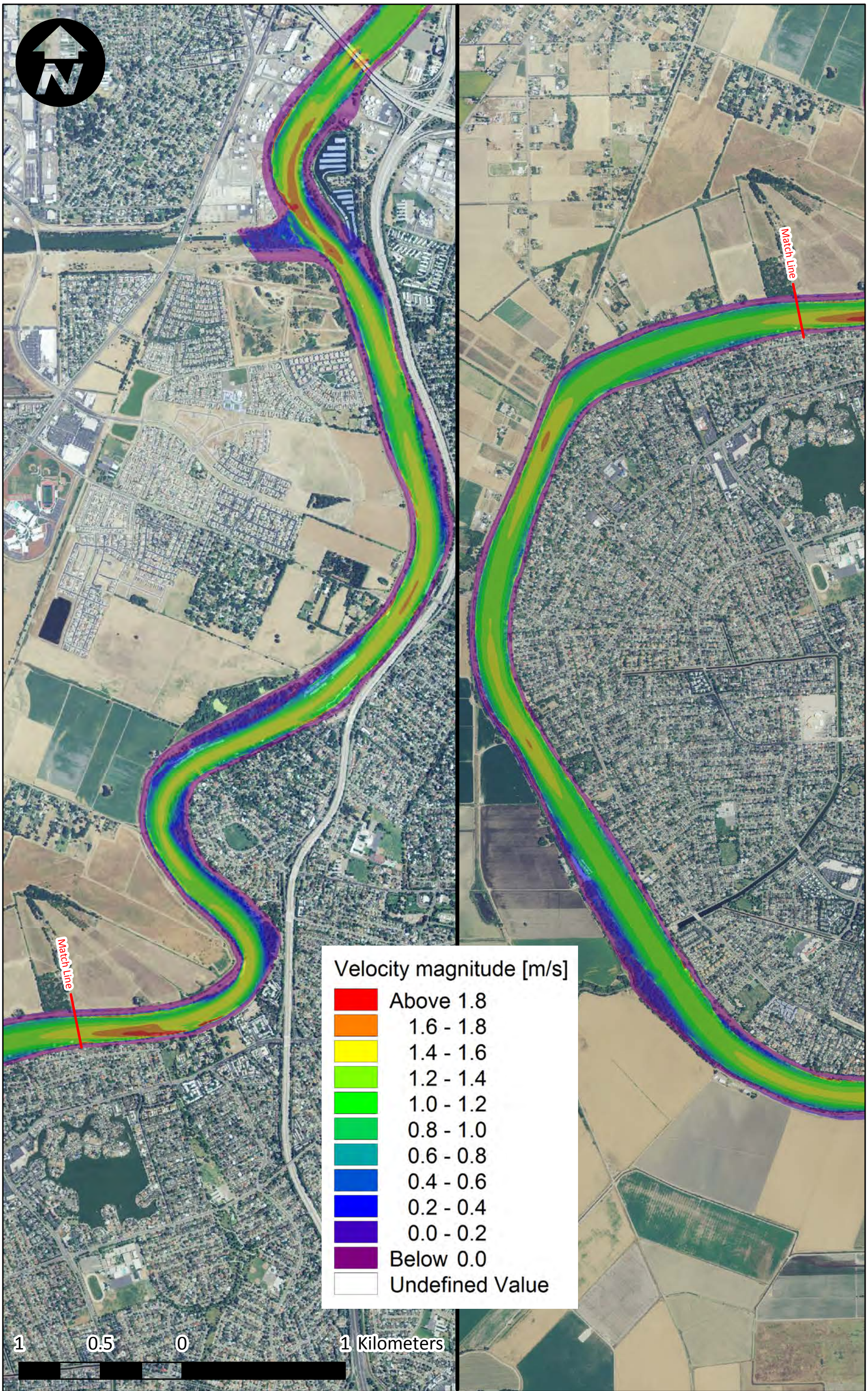
West Sacramento Southport EIP Task Order 3

2-year event maximum bed shear stress

Project No. 11-1013 | Created By: AMS | **Figure 15**



Notes:

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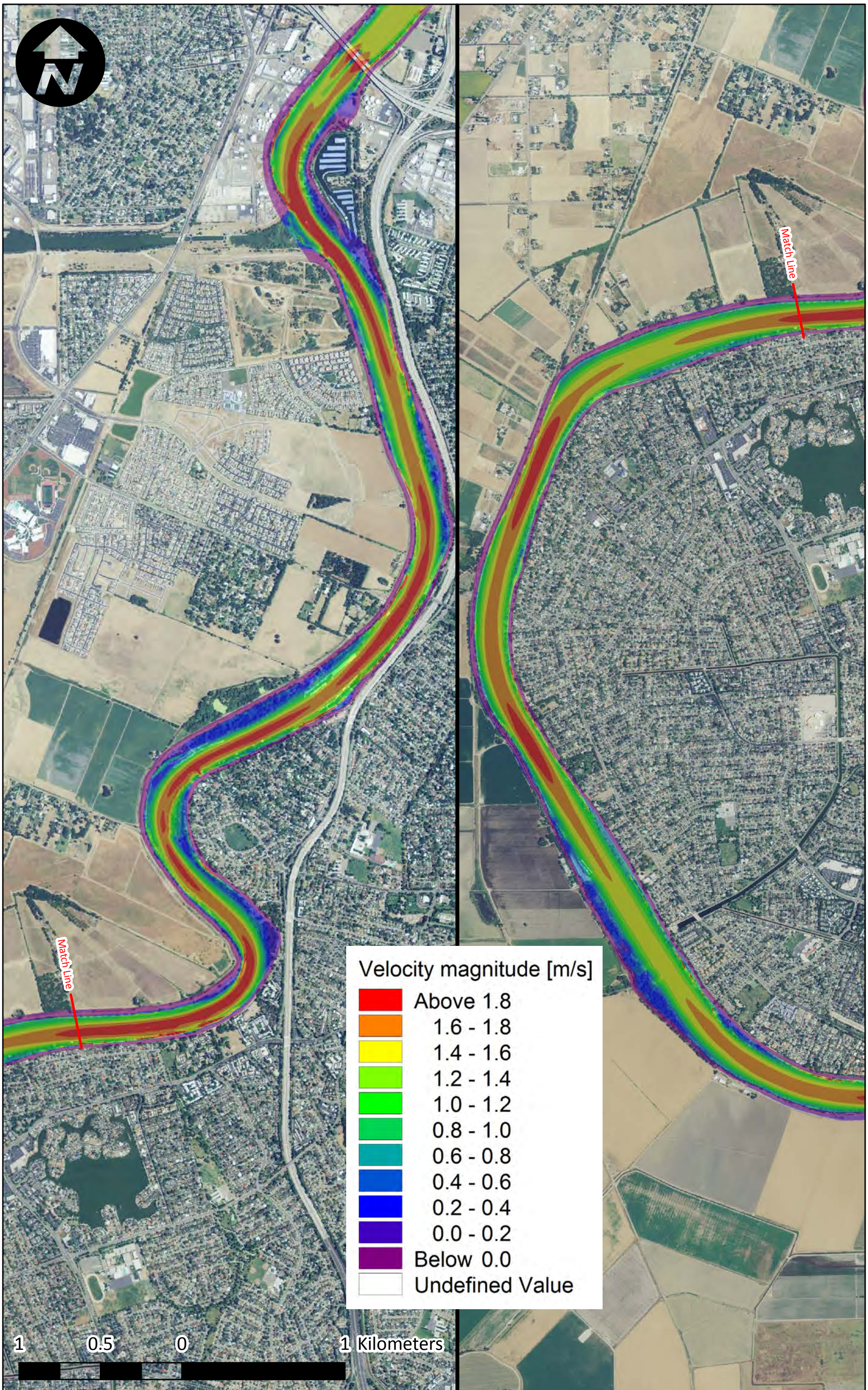
West Sacramento Southport EIP Task Order 3

2-year event maximum velocity magnitude

Project No. 11-1013 | Created By: AMS | **Figure 16**



Notes:

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West Sacramento Southport EIP Task Order 3

100-year event maximum velocity magnitude

Project No. 11-1013 | Created By: AMS | **Figure 17**

Appendix D

Transportation Technical Appendix

Southport Existing ADT and LOS on Major Local Haul Routs

Street	Segments	Road Type	ADT	LOS	Year	Maximum ADT (vehicles/day) per LOS					Facility Type for LOS Criteria
						A	B	C	D	E	
Jefferson Blvd	West Capitol Ave to Lake Washington Blvd	4-lane Principal Arterial	34,938	E	2006	21,600	25,200	28,800	32,400	36,000	Arterial, moderate access control (2–4 stops/mile, few driveways, 35–45 mph)
Jefferson Blvd	Lake Washington to Linden Rd (S)	4-lane Principal Arterial	19,015	A	2006	21,600	25,200	28,800	32,400	36,000	Arterial, moderate access control (2–4 stops/mile, few driveways, 35–45 mph)
Jefferson Blvd	Linden Rd (S) to city limits (S)	2-lane Principal Arterial	15,864	D	2006	10,800	12,600	14,400	16,200	18,000	Arterial, moderate access control (2–4 stops/mile, few driveways, 35–45 mph)
Lake Washington Blvd	Stone Blvd to Jefferson Blvd	4-lane Principal Arterial	7,483	A	2006	21,600	25,200	28,800	32,400	36,000	Arterial, moderate access control (2–4 stops/mile, few driveways, 35–45 mph)
Industrial Blvd	Parkway Blvd to Stone Blvd	4-lane Principal Arterial	18,851	A	2008	21,600	25,200	28,800	32,400	36,000	Arterial, moderate access control (2–4 stops/mile, few driveways, 35–45 mph)
Industrial Blvd	Enterprise Blvd to Parkway Blvd	4-lane Principal Arterial	8,036	A	2007	21,600	25,200	28,800	32,400	36,000	Arterial, moderate access control (2–4 stops/mile, few driveways, 35–45 mph)
Enterprise Blvd	Seaport Blvd to Industrial Blvd	4-lane Principal Arterial	16,424	A	2004	21,600	25,200	28,800	32,400	36,000	Arterial, moderate access control (2–4 stops/mile, few driveways, 35–45 mph)
Linden Rd	Jefferson Blvd to Stonegate Dr	2-lane Minor Arterial	3,995	A	2007	6,000	7,000	8,000	9,000	10,000	Residential collector without access
Linden Rd	Stonegate Dr to S River Rd	2-lane Collector	1,491	A	2007	1,600	3,200	4,800	6,400	8,000	Residential collector with access
Davis Rd	Jefferson Blvd to S River Rd	2-lane Minor Arterial	269	A	2006	1,600	3,200	4,800	6,400	8,000	Residential collector with access
Gregory Ave	Jefferson Blvd to S River Rd	2-lane Minor Arterial	1,395	A	2007	1,600	3,200	4,800	6,400	8,000	Residential collector with access
Burrows Ave	Jefferson Blvd to S River Rd	2-lane Local Road	No data available			1,600	3,200	4,800	6,400	8,000	Residential collector with access

Sources: City of West Sacramento 2008, 2009a. City of West Sacramento 2006.

Date: 9/26/2012

Southport Estimated ADT and LOS on Major Local Haul Routs During Construction

Alternative 1 - Unfavorable

Maximum and Average Daily Trip Distribution on Major Haul Routes

Haul Road	Phase 1			Phase 2		
	Maximum Daily Trips	Average Daily Trip	Duration (Weeks)	Maximum Daily Trips	Average Daily Trip	Duration (Weeks)
Jefferson Blvd north of Industrial Blvd	935	345	17	620	150	24
Jefferson Blvd south of Industrial Blvd	2,870	1,290	17	1,040	540	24
Industrial Blvd	1,910	1,335	8	690	690	9
Linden Rd	1,720	580	17	-	-	-
Davis Rd	1,715	675	11	-	-	-
Gregory Ave	-	-	-	1,345	385	24
Burrows Ave	-	-	-	1,365	250	12

Proposed ADT and LOS on Major Local Haul Routs During Construction

Street	Segments	Existing ADT	Average Construction Daily Trips	Average Construction Daily PCE	Total ADT with Construction Trips	LOS During Construction
Jefferson Blvd	West Capitol Ave to Lake Washington Blvd	34,938	345	518	35,456	E
Jefferson Blvd	Lake Washington to Linden Rd (S)	19,015	1,290	1,935	20,950	A
Jefferson Blvd	Linden Rd (S) to city limits (S)	15,864	1,290	1,935	17,799	E
Lake Washington Blvd	Stone Blvd to Jefferson Blvd	7,483	1335	2,003	9,486	A
Industrial Blvd	Parkway Blvd to Stone Blvd	18,851	1,335	2,003	20,854	A
Industrial Blvd	Enterprise Blvd to Parkway Blvd	8,036	1,335	2,003	10,039	A
Enterprise Blvd	Seaport Blvd to Industrial Blvd	16,424	1,335	2,003	18,427	A
Linden Rd	Jefferson Blvd to Stonegate Dr	3,995	580	870	4,865	A
Linden Rd	Stonegate Dr to S River Rd	1,491	580	870	2,361	B
Davis Rd	Jefferson Blvd to S River Rd	269	675	1,013	1,282	A
Gregory Ave	Jefferson Blvd to S River Rd	1,395	385	578	1,973	B
Burrows Ave	Jefferson Blvd to S River Rd	No data available	250	375	375	A
			PCE	1.5		

Alternative 2 - Unfavorable

Maximum and Average Daily Trip Distribution on Major Haul Routes

Haul Road	Phase 1			Phase 2		
	Maximum Daily Trips	Average Daily Trip	Duration (Weeks)	Maximum Daily Trips	Average Daily Trip	Duration (Weeks)
Jefferson Blvd north of Industrial Blvd	910	380	27	565	295	28
Jefferson Blvd south of Industrial Blvd	2,365	1,265	27	2,090	700	28
Industrial Blvd	1,575	940	17	1390	850	9
Linden Rd	1,490	620	27	-	-	-
Davis Rd	1,320	695	24	-	-	-
Gregory Ave	-	-	-	1,305	455	28
Burrows Ave	-	-	-	1,315	220	23

Proposed ADT and LOS on Major Local Haul Routs During Construction

Street	Segments	Existing ADT	Average Construction Daily Trips	Average Construction Daily PCE	Total ADT with Construction Trips	LOS During Construction
Jefferson Blvd	West Capitol Ave to Lake Washington Blvd	34,938	380	570	35,508	E
Jefferson Blvd	Lake Washington to Linden Rd (S)	19,015	1,265	1,898	20,913	A
Jefferson Blvd	Linden Rd (S) to city limits (S)	15,864	1,265	1,898	17,762	E
Lake Washington Blvd	Stone Blvd to Jefferson Blvd	7,483	940	1,410	8,893	A
Industrial Blvd	Parkway Blvd to Stone Blvd	18,851	940	1,410	20,261	A
Industrial Blvd	Enterprise Blvd to Parkway Blvd	8,036	940	1,410	9,446	A
Enterprise Blvd	Seaport Blvd to Industrial Blvd	16,424	940	1,410	17,834	A
Linden Rd	Jefferson Blvd to Stonegate Dr	3,995	620	930	4,925	A
Linden Rd	Stonegate Dr to S River Rd	1,491	620	930	2,421	B
Davis Rd	Jefferson Blvd to S River Rd	269	695	1,043	1,312	A
Gregory Ave	Jefferson Blvd to S River Rd	1,395	455	683	2,078	B
Burrows Ave	Jefferson Blvd to S River Rd	No data available	220	330	330	A
			PCE	1.5		

Alternative 3 - Unfavorable

Maximum and Average Daily Trip Distribution on Major Haul Routes

Haul Road	Phase 1			Phase 2		
	Maximum Daily Trips	Average Daily Trip	Duration (Weeks)	Maximum Daily Trips	Average Daily Trip	Duration (Weeks)
Jefferson Blvd north of Industrial Blvd	1175	410	22	575	230	22
Jefferson Blvd south of Industrial Blvd	3,115	1,020	22	2,075	560	22
Industrial Blvd	2,075	1,500	6	1385	805	6
Linden Rd	1,485	540	20	-	-	-
Davis Rd	1,455	505	22	-	-	-
Gregory Ave	-	-	-	1,390	295	22
Burrows Ave	-	-	-	1,510	230	22

Proposed ADT and LOS on Major Local Haul Routs During Construction

Street	Segments	Existing ADT	Average Construction Daily Trips	Average Construction Daily PCE	Total ADT with Construction Trips	LOS During Construction
Jefferson Blvd	West Capitol Ave to Lake Washington Blvd	34,938	410	615	35,553	E
Jefferson Blvd	Lake Washington to Linden Rd (S)	19,015	1,020	1,530	20,545	A
Jefferson Blvd	Linden Rd (S) to city limits (S)	15,864	1,020	1,530	17,394	E
Lake Washington Blvd	Stone Blvd to Jefferson Blvd	7,483	1500	2,250	9,733	A
Industrial Blvd	Parkway Blvd to Stone Blvd	18,851	1,500	2,250	21,101	A
Industrial Blvd	Enterprise Blvd to Parkway Blvd	8,036	1,500	2,250	10,286	A
Enterprise Blvd	Seaport Blvd to Industrial Blvd	16,424	1,500	2,250	18,674	A
Linden Rd	Jefferson Blvd to Stonegate Dr	3,995	540	810	4,805	A
Linden Rd	Stonegate Dr to S River Rd	1,491	540	810	2,301	B
Davis Rd	Jefferson Blvd to S River Rd	269	505	758	1,027	A
Gregory Ave	Jefferson Blvd to S River Rd	1,395	295	443	1,838	B
Burrows Ave	Jefferson Blvd to S River Rd	No data available	230	345	345	A
			PCE	1.5		

Alternative 4 - Unfavorable

Maximum and Average Daily Trip Distribution on Major Haul Routes

Haul Road	Phase 1			Phase 2		
	Maximum Daily Trips	Average Daily Trip	Duration (Weeks)	Maximum Daily Trips	Average Daily Trip	Duration (Weeks)
Jefferson Blvd north of Industrial Blvd	920	355	24	565	275	30
Jefferson Blvd south of Industrial Blvd	2,090	1,135	24	2,090	690	30
Industrial Blvd	1,390	895	14	1390	830	10
Linden Rd	1,355	585	17	-	-	-
Davis Rd	1,330	690	24	-	-	-
Gregory Ave	-	-	-	1,305	465	30
Burrows Ave	-	-	-	1,315	195	23

Proposed ADT and LOS on Major Local Haul Routs During Construction

Street	Segments	Existing ADT	Average Construction Daily Trips	Average Construction Daily PCE	Total ADT with Construction Trips	LOS During Construction
Jefferson Blvd	West Capitol Ave to Lake Washington Blvd	34,938	355	533	35,471	E
Jefferson Blvd	Lake Washington to Linden Rd (S)	19,015	1,135	1,703	20,718	A
Jefferson Blvd	Linden Rd (S) to city limits (S)	15,864	1,135	1,703	17,567	E
Lake Washington Blvd	Stone Blvd to Jefferson Blvd	7,483	895	1,343	8,826	A
Industrial Blvd	Parkway Blvd to Stone Blvd	18,851	895	1,343	20,194	A
Industrial Blvd	Enterprise Blvd to Parkway Blvd	8,036	895	1,343	9,379	A
Enterprise Blvd	Seaport Blvd to Industrial Blvd	16,424	895	1,343	17,767	A
Linden Rd	Jefferson Blvd to Stonegate Dr	3,995	585	878	4,873	A
Linden Rd	Stonegate Dr to S River Rd	1,491	585	878	2,369	B
Davis Rd	Jefferson Blvd to S River Rd	269	690	1,035	1,304	A
Gregory Ave	Jefferson Blvd to S River Rd	1,395	465	698	2,093	B
Burrows Ave	Jefferson Blvd to S River Rd	No data available	195	293	293	A
			PCE	1.5		

Date: 9/26/2012

Phase 1 (2013) Daily Vehicle Trip Distribution

Trip Generation and Distribution

		Trip Generation			Trip Distribution									
					Jefferson Blvd north of Industrial Blvd		Jefferson Blvd south of Industrial Blvd		Industrial Blvd		Linden Rd		Davis Rd	
		Max Daily Trips	Average Daily Trips	Duration (weeks)	Max Daily Trips	Average Daily Trips	Max Daily Trips	Average Daily Trips	Max Daily Trips	Average Daily Trips	Max Daily Trips	Average Daily Trips	Max Daily Trips	Average Daily Trips
Alternative 1 Phase 1 - Unfavorable														
All	Project Site Activities	1248	461	17	936	346	936	346	0	0				
C	Project Site Activities	370	217	11	278	163	278	163	0	0	0	0	278	163
D	Project Site Activities	374	83	11	281	62	281	62	0	0	0	0	281	62
E	Project Site Activities	408	138	6	306	103	306	103	0	0	153	52	153	52
F	Project Site Activities	380	134	17	285	100	285	100	0	0	285	100	0	0
G	Project Site Activities	384	83	9	288	62	288	62	0	0	288	62	0	0
All	Off-Site Borrow	3824	2670	8	0	0	2868	2003	1912	1335				
C	Off-Site Borrow	1912	1912	5	0	0	1434	1434	956	956	0	0	1434	1434
D	Off-Site Borrow	1384	1384	1	0	0	1038	1038	692	692	0	0	1038	1038
E	Off-Site Borrow	1384	1384	1	0	0	1038	1038	692	692	519	519	519	519
F	Off-Site Borrow	1912	1912	4	0	0	1434	1434	956	956	1434	1434	0	0
G	Off-Site Borrow	1384	1384	1	0	0	1038	1038	692	692	1038	1038	0	0
Total Trips on each Street Segment					**936**	**346**	**2868**	**1288**	**1912**	**1335**	**1722**	**581**	**1715**	**677**
Duration of Average Trips (weeks)						**17**		**17**		**8**		**17**		**11**
Alternative 2 Phase 1 - Unfavorable														
All	Project Site Activities	1212	505	27	909	379	909	379	0	0				
C	Project Site Activities	356	188	24	267	141	267	141	0	0	0	0	267	141
D	Project Site Activities	374	121	8	281	91	281	91	0	0	0	0	281	91
E	Project Site Activities	408	160	8	306	120	306	120	0	0	153	60	153	60
F	Project Site Activities	408	176	27	306	132	306	132	0	0	306	132	0	0
G	Project Site Activities	350	117	9	263	88	263	88	0	0	263	88	0	0
All	Off-Site Borrow	3152	1876	17	0	0	2364	1407	1576	938				
C	Off-Site Borrow	1384	1384	8	0	0	1038	1038	692	692	0	0	1038	1038
D	Off-Site Borrow	1320	1320	2	0	0	990	990	660	660	0	0	990	990
E	Off-Site Borrow	1576	1576	3	0	0	1182	1182	788	788	591	591	591	591
F	Off-Site Borrow	1320	1320	9	0	0	990	990	660	660	990	990	0	0
G	Off-Site Borrow	1576	1576	1	0	0	1182	1182	788	788	1182	1182	0	0
Total Trips on each Street Segment					**909**	**379**	**2364**	**1265**	**1576**	**938**	**1488**	**618**	**1319**	**693**
Duration of Average Trips (weeks)						**27**		**27**		**17**		**27**		**24**
Alternative 3 Phase 1 - Unfavorable														
All	Project Site Activities	1564	544	22	1173	408	1173	408	0	0				
C	Project Site Activities	486	88	22	365	66	365	66	0	0	0	0	365	66
D	Project Site Activities	554	143	16	416	107	416	107	0	0	0	0	416	107
E	Project Site Activities	594	161	19	446	121	446	121	0	0	223	60	223	60
F	Project Site Activities	594	87	20	446	65	446	65	0	0	446	65	0	0
G	Project Site Activities	418	138	15	314	104	314	104	0	0	314	104	0	0
All	Off-Site Borrow	4152	2999	6	0	0	3114	2249	2076	1499				
C	Off-Site Borrow	1384	1384	5	0	0	1038	1038	692	692	0	0	1038	1038
D	Off-Site Borrow	1384	1384	1	0	0	1038	1038	692	692	0	0	1038	1038
E	Off-Site Borrow	1384	1384	1	0	0	1038	1038	692	692	519	519	519	519
F	Off-Site Borrow	1384	1384	5	0	0	1038	1038	692	692	1038	1038	0	0
G	Off-Site Borrow	1384	1384	1	0	0	1038	1038	692	692	1038	1038	0	0
Total Trips on each Street Segment					**1173**	**408**	**3114**	**1022**	**2076**	**1499**	**1484**	**538**	**1454**	**503**
Duration of Average Trips (weeks)						**22**		**22**		**6**		**20**		**22**

Alternative 4 Phase 1 - Unfavorable

All	Project Site Activities	1228	471	24	921	353	921	353	0	0				
C	Project Site Activities	356	188	24	267	141	267	141	0	0	0	0	267	141
D	Project Site Activities	374	110	9	281	82	281	82	0	0	0	0	281	82
E	Project Site Activities	408	160	8	306	120	306	120	0	0	153	60	153	60
F	Project Site Activities	408	150	17	306	113	306	113	0	0	306	113	0	0
G	Project Site Activities	350	147	7	263	110	263	110	0	0	263	110	0	0
All	Off-Site Borrow	2784	1786	14	0	0	2088	1340	1392	893				
C	Off-Site Borrow	1384	1384	8	0	0	1038	1038	692	692	0	0	1038	1038
D	Off-Site Borrow	1400	1400	2	0	0	1050	1050	700	700	0	0	1050	1050
E	Off-Site Borrow	1384	1384	3	0	0	1038	1038	692	692	519	519	519	519
F	Off-Site Borrow	1400	1400	4	0	0	1050	1050	700	700	1050	1050	0	0
G	Off-Site Borrow	1384	1384	1	0	0	1038	1038	692	692	1038	1038	0	0
	Total Trips on each Street Segment				**921**	**353**	**2088**	**1135**	**1392**	**893**	**1356**	**586**	**1331**	**690**
	Duration of Average Trips (weeks)					**24**		**24**		**14**		**17**		**24**

Trip Distribution Assumptions:

75% On-site excavated material and debris on Public Road
75% Material borrow trucks on public roads
50% Material borrow from Deep Water Ship Channel

	% of Road Acces to each Segment				
Segment	Jefferson	Linden	Davis	Gregory	Burrows
A	100%	0	0	0	100%
B	100%	0	0	100%	0
C	100%	0	100%	0	0
D	100%	0	100%	0	0
E	100%	50%	50%	0	0
F	100%	100%	0	0	0
G	100%	100%	0	0	0

Date: 9/26/2012

Phase 1 (2013) Daily Vehicle Trip Distribution

Trip Generation and Distribution

		Trip Generation			Trip Distribution									
					Jefferson Blvd north of Industrial Blvd		Jefferson Blvd south of Industrial Blvd		Industrial Blvd		Gregory Ave		Burrows Ave	
		Max Daily Trips	Average Daily Trips	Duration (weeks)	Max Daily Trips	Average Daily Trips	Max Daily Trips	Average Daily Trips	Max Daily Trips	Average Daily Trips	Max Daily Trips	Average Daily Trips	Max Daily Trips	Average Daily Trips
Alternative 1 Phase 1 - Unfavorable														
All	Project Site Activities	826	201	24	620	151	620	151	0	0				
A	Project Site Activities	436	102	12	327	76	327	76	0	0	0	0	327	76
B	Project Site Activities	406	111	24	305	83	305	83	0	0	305	83	0	0
All	Off-Site Borrow	1384	1384	9	0	0	1038	1038	692	692				
A	Off-Site Borrow	1384	1384	2	0	0	1038	1038	692	692	0	0	1038	1038
B	Off-Site Borrow	1384	1384	7	0	0	1038	1038	692	692	1038	1038	0	0
	Total Trips on each Street Segment				**620**	**151**	**1038**	**540**	**692**	**692**	**1343**	**386**	**1365**	**249**
	Duration of Average Trips (weeks)					**24**		**24**		**9**		**24**		**12**
Alternative 2 Phase 1 - Unfavorable														
All	Project Site Activities	752	390	28	564	293	564	293	0	0				
A	Project Site Activities	356	233	23	267	175	267	175	0	0	0	0	267	175
B	Project Site Activities	356	159	28	267	119	267	119	0	0	267	119	0	0
All	Off-Site Borrow	2784	1695	9	0	0	2088	1271	1392	848				
A	Off-Site Borrow	1400	1400	2	0	0	1050	1050	700	700	0	0	1050	1050
B	Off-Site Borrow	1384	1384	9	0	0	1038	1038	692	692	1038	1038	0	0
	Total Trips on each Street Segment				**564**	**293**	**2088**	**701**	**1392**	**848**	**1305**	**453**	**1317**	**219**
	Duration of Average Trips (weeks)					**28**		**28**		**9**		**28**		**23**
Alternative 3 Phase 1 - Unfavorable														
All	Project Site Activities	768	305	22	576	229	576	229	0	0				
A	Project Site Activities	628	183	22	471	138	471	138	0	0	0	0	471	138
B	Project Site Activities	466	82	22	350	61	350	61	0	0	350	61	0	0
All	Off-Site Borrow	2768	1615	6	0	0	2076	1211	1384	807				
A	Off-Site Borrow	1384	1384	2	0	0	1038	1038	692	692	0	0	1038	1038
B	Off-Site Borrow	1384	1384	5	0	0	1038	1038	692	692	1038	1038	0	0
	Total Trips on each Street Segment				**576**	**229**	**2076**	**559**	**1384**	**807**	**1388**	**297**	**1509**	**232**
	Duration of Average Trips (weeks)					**22**		**22**		**6**		**22**		**22**
Alternative 4 Phase 1 - Unfavorable														
All	Project Site Activities	752	366	30	564	274	564	274	0	0				
A	Project Site Activities	356	218	23	267	163	267	163	0	0	0	0	267	163
B	Project Site Activities	356	159	30	267	119	267	119	0	0	267	119	0	0
All	Off-Site Borrow	2784	1664	10	0	0	2088	1248	1392	832				
A	Off-Site Borrow	1400	1400	2	0	0	1050	1050	700	700	0	0	1050	1050
B	Off-Site Borrow	1384	1384	10	0	0	1038	1038	692	692	1038	1038	0	0
	Total Trips on each Street Segment				**564**	**274**	**2088**	**690**	**1392**	**832**	**1305**	**465**	**1317**	**195**
	Duration of Average Trips (weeks)					**30**		**30**		**10**		**30**		**23**

Trip Distribution Assumptions:

75% On-site excavated material and debris on Public Road
75% Material borrow trucks on public roads
50% Material borrow from Deep Water Ship Channel

	% of Road Acces to each Segment				
Segment	Jefferson	Linden	Davis	Gregory	Burrows
A	100%	0	0	0	100%
B	100%	0	0	100%	0
C	100%	0	100%	0	0
D	100%	0	100%	0	0
E	100%	50%	50%	0	0
F	100%	100%	0	0	0
G	100%	100%	0	0	0

Date: 9/26/2012

2013 Daily Vehicle Trips on Local Streets from Project Site Related Activities

Alternative/Segment/Construction Phase	4/28/2013 - 5/4/2013	5/5/2013 - 5/11/2013	5/12/2013 - 5/18/2013	5/19/2013 - 5/25/2013	5/26/2013 - 6/1/2013	6/2/2013 - 6/8/2013	6/9/2013 - 6/15/2013	6/16/2013 - 6/22/2013	6/23/2013 - 6/29/2013
Alternative 1 Phase 1 - Unfavorable	***910.0***	***860.0***	***484.0***	***1158.0***	***1248.0***	***1074.0***	***470.0***	***172.0***	***172.0***
C	370.0	370.0	370.0	370.0	370.0	52.0	52.0	52.0	52.0
D	62.0	20.0	20.0	350.0	40.0	374.0	10.0	10.0	10.0
E	350.0	8.0	8.0	40.0	408.0	12.0	0.0	0.0	0.0
F	80.0	38.0	38.0	350.0	350.0	350.0	350.0	52.0	52.0
G	8.0	384.0	8.0	8.0	40.0	246.0	18.0	18.0	18.0
Additional Workforce	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternative 2 Phase 1 - Unfavorable	***1006.0***	***1148.0***	***806.0***	***836.0***	***536.0***	***1066.0***	***1212.0***	***1150.0***	***764.0***
C	232.0	350.0	350.0	350.0	350.0	356.0	356.0	356.0	356.0
D	118.0	20.0	20.0	350.0	8.0	40.0	40.0	374.0	0.0
E	350.0	350.0	8.0	50.0	50.0	50.0	408.0	12.0	0.0
F	258.0	38.0	38.0	38.0	38.0	350.0	350.0	350.0	350.0
G	8.0	350.0	350.0	8.0	50.0	230.0	18.0	18.0	18.0
C-G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Additional Workforce	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternative 3 Phase 1 - Unfavorable	***984.0***	***1506.0***	***1562.0***	***1564.0***	***1254.0***	***546.0***	***690.0***	***178.0***	***1034.0***
C	214.0	350.0	350.0	40.0	40.0	40.0	40.0	40.0	486.0
D	120.0	350.0	378.0	378.0	378.0	40.0	554.0	10.0	10.0
E	350.0	378.0	378.0	378.0	378.0	378.0	8.0	8.0	40.0
F	252.0	38.0	38.0	350.0	40.0	40.0	40.0	40.0	40.0
G	8.0	350.0	378.0	378.0	378.0	8.0	8.0	40.0	418.0
Additional Workforce	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternative 4 Phase 1 - Unfavorable	***1006.0***	***1148.0***	***806.0***	***836.0***	***536.0***	***1066.0***	***1228.0***	***1132.0***	***764.0***
C	232.0	350.0	350.0	350.0	350.0	356.0	356.0	356.0	356.0
D	118.0	20.0	20.0	350.0	8.0	40.0	40.0	374.0	18.0
E	350.0	350.0	8.0	50.0	50.0	50.0	408.0	12.0	0.0
F	258.0	38.0	38.0	38.0	38.0	350.0	350.0	350.0	350.0
G	8.0	350.0	350.0	8.0	50.0	230.0	34.0	0.0	0.0
C-G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Additional Workforce	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2013 Daily Vehicle Trips on Local Streets from Off-Site Material Borrow Activities

Alternative 1 Phase 1 - Unfavorable		***0.0***	***0.0***	***0.0***	***1384.0***	***2768.0***	***1912.0***	***1912.0***	***3824.0***	***3824.0***
C	C-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	1912.0	1912.0	1912.0	1912.0
D	D-Off-Site Material Borrow	0.0	0.0	0.0	0.0	1384.0	0.0	0.0	0.0	0.0
E	E-Off-Site Material Borrow	0.0	0.0	0.0	1384.0	0.0	0.0	0.0	0.0	0.0
F	F-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1912.0	1912.0
G	G-Off-Site Material Borrow	0.0	0.0	0.0	0.0	1384.0	0.0	0.0	0.0	0.0
Alternative 2 Phase 1 - Unfavorable		***0.0***	***0.0***	***0.0***	***1576.0***	***3152.0***	***2896.0***	***1320.0***	***0.0***	***0.0***
C	C-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	D-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	1320.0	1320.0	0.0	0.0
E	E-Off-Site Material Borrow	0.0	0.0	0.0	1576.0	1576.0	1576.0	0.0	0.0	0.0
F	F-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G	G-Off-Site Material Borrow	0.0	0.0	0.0	0.0	1576.0	0.0	0.0	0.0	0.0
Alternative 3 Phase 1 - Unfavorable		***0.0***	***0.0***	***0.0***	***1384.0***	***2768.0***	***4152.0***	***2768.0***	***4152.0***	***2768.0***
C	C-Off-Site Material Borrow	0.0	0.0	0.0	1384.0	1384.0	1384.0	1384.0	1384.0	0.0
D	D-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	1384.0	0.0	0.0	0.0
E	E-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1384.0
F	F-Off-Site Material Borrow	0.0	0.0	0.0	0.0	1384.0	1384.0	1384.0	1384.0	1384.0
G	G-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1384.0	0.0
Alternative 4 Phase 1 - Unfavorable		***0.0***	***0.0***	***0.0***	***1384.0***	***2768.0***	***2784.0***	***1400.0***	***0.0***	***0.0***
C	C-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	D-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	1400.0	1400.0	0.0	0.0
E	E-Off-Site Material Borrow	0.0	0.0	0.0	1384.0	1384.0	1384.0	0.0	0.0	0.0
F	F-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G	G-Off-Site Material Borrow	0.0	0.0	0.0	0.0	1384.0	0.0	0.0	0.0	0.0

Alternative/Segment/Construction Phase	6/30/2013 - 7/6/2013	7/7/2013 - 7/13/2013	7/14/2013 - 7/20/2013	7/21/2013 - 7/27/2013	7/28/2013- 8/3/2013	8/4/2013 - 8/10/2013	8/11/2013 - 8/17/2013	8/18/2013 - 8/24/2013	8/25/2013 - 8/31/2013
Alternative 1 Phase 1 - Unfavorable	***154.0***	***382.0***	***420.0***	***66.0***	***66.0***	***66.0***	***66.0***	***66.0***	***0.0***
C	52.0	280.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	10.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F	52.0	52.0	380.0	26.0	26.0	26.0	26.0	26.0	0.0
G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Additional Workforce	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	0.0
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternative 2 Phase 1 - Unfavorable	***752.0***	***752.0***	***436.0***	***436.0***	***436.0***	***436.0***	***120.0***	***120.0***	***120.0***
C	356.0	356.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F	356.0	356.0	356.0	356.0	356.0	356.0	40.0	40.0	40.0
G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C-G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Additional Workforce	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternative 3 Phase 1 - Unfavorable	***1282.0***	***150.0***	***138.0***	***138.0***	***138.0***	***138.0***	***120.0***	***110.0***	***110.0***
C	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
D	10.0	10.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
E	594.0	30.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
F	594.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
G	18.0	18.0	18.0	18.0	18.0	18.0	0.0	0.0	0.0
Additional Workforce	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternative 4 Phase 1 - Unfavorable	***448.0***	***448.0***	***132.0***	***132.0***	***488.0***	***122.0***	***122.0***	***122.0***	***80.0***
C	356.0	356.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F	52.0	52.0	52.0	52.0	408.0	42.0	42.0	42.0	0.0
G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C-G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Additional Workforce	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2013 Daily Vehicle Trips on Local Streets f

Alternative 1 Phase 1 - Unfavorable		***3824.0***	***1912.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
C	C-Off-Site Material Borrow	1912.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	D-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	E-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F	F-Off-Site Material Borrow	1912.0	1912.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G	G-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternative 2 Phase 1 - Unfavorable		***0.0***	***0.0***	***1384.0***	***1384.0***	***1384.0***	***1384.0***	***2704.0***	***2704.0***	***2704.0***
C	C-Off-Site Material Borrow	0.0	0.0	1384.0	1384.0	1384.0	1384.0	1384.0	1384.0	1384.0
D	D-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	E-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F	F-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	1320.0	1320.0	1320.0
G	G-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternative 3 Phase 1 - Unfavorable		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
C	C-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	D-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	E-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F	F-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G	G-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternative 4 Phase 1 - Unfavorable		***1400.0***	***1400.0***	***2784.0***	***2784.0***	***1384.0***	***1384.0***	***1384.0***	***1384.0***	***1384.0***
C	C-Off-Site Material Borrow	0.0	0.0	1384.0	1384.0	1384.0	1384.0	1384.0	1384.0	1384.0
D	D-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	E-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F	F-Off-Site Material Borrow	1400.0	1400.0	1400.0	1400.0	0.0	0.0	0.0	0.0	0.0
G	G-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Alternative/Segment/Construction Phase	9/1/2013 - 9/7/2013	9/8/2013 - 9/14/2013	9/15/2013 - 9/21/2013	9/22/2013 - 9/28/2013	9/29/2013 - 10/5/2013	10/6/2013 - 10/12/2013	10/13/2013 - 10/19/2013	10/20/2013 - 10/26/2013	10/27/2013 - 11/2/2013
Alternative 1 Phase 1 - Unfavorable	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Additional Workforce	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternative 2 Phase 1 - Unfavorable	***120.0***	***420.0***	***98.0***	***98.0***	***98.0***	***98.0***	***448.0***	***58.0***	***58.0***
C	40.0	340.0	18.0	18.0	18.0	18.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F	40.0	40.0	40.0	40.0	40.0	40.0	408.0	18.0	18.0
G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C-G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Additional Workforce	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternative 3 Phase 1 - Unfavorable	***110.0***	***92.0***	***66.0***	***66.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
C	26.0	26.0	26.0	26.0	0.0	0.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F	26.0	26.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Additional Workforce	40.0	40.0	40.0	40.0	0.0	0.0	0.0	0.0	0.0
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternative 4 Phase 1 - Unfavorable	***80.0***	***380.0***	***58.0***	***58.0***	***58.0***	***58.0***	***0.0***	***0.0***	***0.0***
C	40.0	340.0	18.0	18.0	18.0	18.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C-G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Additional Workforce	40.0	40.0	40.0	40.0	40.0	40.0	0.0	0.0	0.0
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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Alternative 1 Phase 1 - Unfavorable		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
C	C-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	D-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	E-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F	F-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G	G-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternative 2 Phase 1 - Unfavorable		***2704.0***	***1320.0***	***1320.0***	***1320.0***	***1320.0***	***1320.0***	***0.0***	***0.0***
C	C-Off-Site Material Borrow	1384.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	D-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	E-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F	F-Off-Site Material Borrow	1320.0	1320.0	1320.0	1320.0	1320.0	1320.0	0.0	0.0
G	G-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternative 3 Phase 1 - Unfavorable		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
C	C-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	D-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	E-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F	F-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G	G-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternative 4 Phase 1 - Unfavorable		***1384.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
C	C-Off-Site Material Borrow	1384.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	D-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	E-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F	F-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G	G-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

					Haul Trucks	Workers	
					2	2	Trips / truck and worker
					1	1	PCE per vehicle
Alternative/Segment/Construction Phase	Max Trips	Average Trips	Duration (weeks)	Total Vehicle Trips			
Alternative 1 Phase 1 - Unfavorable	***1248***	***461***	***17***				
C	370	217	11				
D	374	83	11				
E	408	138	6				
F	380	134	17				
G	384	83	9				
Additional Workforce				40		20	
Electricity							
Alternative 2 Phase 1 - Unfavorable	***1212***	***505***	***27***				
C	356	188	24				
D	374	121	8				
E	408	160	8				
F	408	176	27				
G	350	117	9				
C-G	0						
Additional Workforce				40		20	
Electricity							
Alternative 3 Phase 1 - Unfavorable	***1564***	***544***	***22***				
C	486	88	22				
D	554	143	16				
E	594	161	19				
F	594	87	20				
G	418	138	15				
Additional Workforce				40		20	
Electricity							
Alternative 4 Phase 1 - Unfavorable	***1228***	***471***	***24***				
C	356	188	24				
D	374	110	9				
E	408	160	8				
F	408	150	17				
G	350	147	7				
C-G	0						
Additional Workforce				40		20	
Electricity							

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Alternative 1 Phase 1 - Unfavorable		***3824***	***2670***	***8***			
C	C-Off-Site Material Borrow	1912	1912	5	1912	936	20
D	D-Off-Site Material Borrow	1384	1384	1	1384	672	20
E	E-Off-Site Material Borrow	1384	1384	1	1384	672	20
F	F-Off-Site Material Borrow	1912	1912	4	1912	936	20
G	G-Off-Site Material Borrow	1384	1384	1	1384	672	20
Alternative 2 Phase 1 - Unfavorable		***3152***	***1876***	***17***			
C	C-Off-Site Material Borrow	1384	1384	8	1384	672	20
D	D-Off-Site Material Borrow	1320	1320	2	1320	640	20
E	E-Off-Site Material Borrow	1576	1576	3	1576	768	20
F	F-Off-Site Material Borrow	1320	1320	9	1320	640	20
G	G-Off-Site Material Borrow	1576	1576	1	1576	768	20
Alternative 3 Phase 1 - Unfavorable		***4152***	***2999***	***6***			
C	C-Off-Site Material Borrow	1384	1384	5	1384	672	20
D	D-Off-Site Material Borrow	1384	1384	1	1384	672	20
E	E-Off-Site Material Borrow	1384	1384	1	1384	672	20
F	F-Off-Site Material Borrow	1384	1384	5	1384	672	20
G	G-Off-Site Material Borrow	1384	1384	1	1384	672	20
Alternative 4 Phase 1 - Unfavorable		***2784***	***1786***	***14***			
C	C-Off-Site Material Borrow	1384	1384	8	1384	672	20
D	D-Off-Site Material Borrow	1400	1400	2	1400	680	20
E	E-Off-Site Material Borrow	1384	1384	3	1384	672	20
F	F-Off-Site Material Borrow	1400	1400	4	1400	680	20
G	G-Off-Site Material Borrow	1384	1384	1	1384	672	20

SOUTHPORT SACRAMENTO RIVER EIP SITE
HIGH EMISSIONS ESTIMATE SUMMARY - (Unfavorable Scenario)

CMA #1 PHASE 1 Project Site Related Activities

Segment	Sequence Order	Construction Phase	Equipment	Number of Equipment	9 Hrs. Work Days	Daily Truck Trips	Roundtrip Miles	Daily Earthwork Rate (Dust Emissions)	Projected Time Frame
C	-	Building Demo	Bulldozer	0	0				July 11
			Front End Loader	0	0				
			Excavator	0	0				
			Haul Truck	0	0				
	-	Roadway Removal	Cold Planer	0	0				
			Scraper	0	0				
			Dump Truck	0	0				
			Bulldozer	0	0				
			Excavator	0	0				
	3	Roadway Replace	Dump Truck	9	1	15	20		
			Vibratory Compactor	1	1				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	1				
			Motor Grader	1	1				
			Bulldozer	1	1				
			Worker Commute	5	1	1	22		
	1	Stripping	Wheel Tractor Scraper	3	26			4.79 Ac per day	May 1 to June 2
			Bulldozer	1	33				
			Dump Truck	10	33	17	20		
			Excavator	1	33				
			Worker Commute	15	33	1	22		
			Dust Emission	4.8	33				
	-	Levee Degrade	Scraper	0	0			21,537 CY per day	June 3 to July 10
			Bulldozer	0	0				
			Dump Truck	0	0				
			Excavator	0	0				
	2	Soil Borrow Extraction/Levee Placement	Scraper	14	38				
			Excavator	6	38				
			Dump Truck	117	38	0	0		
			Sheeps Foot Compactor	1	38				
			Bulldozer	2	38				
			Motor Grader	1	38				
			Water Truck	2	6				
			Worker Commute	26	38	1	22		
			Dust Emission	2.2	38				
D	1	Building Demo	Bulldozer	1	17				May 1 to May 17
			Front End Loader	1	17				
			Excavator	1	17				
			Haul Truck	1	1	7	20		
			Worker Commute	3	17	1	22		
			Dust Emission	1.0	1				
	1	Roadway Removal	Cold Planer	1	1				May 1st
			Scraper	1	1				
			Dump Truck	1	1	17	20		
			Bulldozer	1	1				
			Excavator	1	1				
			Worker Commute	4	1	1	22		
	5	Roadway Replace	Dump Truck	13	3	14	20		June 3 to June 5
			Vibratory Compactor	1	3				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	3				
			Motor Grader	1	3				
			Bulldozer	1	3				
			Worker Commute	5	3	1	22		
	2	Stripping	Wheel Tractor Scraper	3	5			4.80 Ac per day	May 18 May 23
			Bulldozer	1	6				
			Dump Truck	10	6	17	20		
			Excavator	1	6				
			Worker Commute	5	6	1	22		
			Dust Emission	4.8	6				
	-	Levee Degrade	Scraper	0	0				May 24 May 25
			Bulldozer	0	0				
			Dump Truck	0	0				
			Excavator	0	0				
	3	SB Cutoff Wall Installation	Dump Truck	3	2	53	0.25		
			Bulldozer	1	2				
			Long Reach Excavator	1	2				
			Hydraulic Excavator	1	2				
			ugh Terrain/Telehandler Fork	1	2				
			Worker Commute	4	2	1	22		
	4	Soil Borrow Extraction/Levee Placement	Scraper	10	8			14,539 CY per day	May 26 June 2
			Excavator	4	8				
			Dump Truck	84	8	0	0		
			Sheeps Foot Compactor	1	8				
			Bulldozer	2	8				
			Motor Grader	1	8				
			Water Truck	2	2				
			Worker Commute	20	8	1	22		
			Dust Emission	1.5	8				
	6	Rip Rap Installation	Crane	2	33				June 6 July 8
			Bulldozer	1	33				
			Hydraulic Excavator	1	33				
			Towboat	1	33	1.5	180		
			Worker Commute	5	33	1	22		
	4	Roadway Replace	Dump Truck	14	3	14	20		May 29
			Vibratory Compactor	2	4				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	4				
			Motor Grader	2	4				
			Bulldozer	2	4				
			Worker Commute	8	4	1	22		

	1	Stripping	Wheel Tractor Scraper	3	6			4.53 Ac per day	May 1 to May 7
			Bulldozer	1	7				
			Dump Truck	10	7	17	20		
			Excavator	1	7				
			Worker Commute	5	7	1	22		
			Dust Emission	4.5	7				
	-	Levee Degrade	Scraper	0	0				May 8 to May 16
			Bulldozer	0	0				
			Dump Truck	0	0				
			Excavator	0	0				
	2	SB Cutoff Wall Installation	Dump Truck	3	9	53	0.25		
			Bulldozer	1	9				
			Long Reach Excavator	1	9				
			Hydraulic Excavator	1	9				
			ugh Terrain/Telehandler Fork	1	9				
			Worker Commute	4	9	1	22		
E	3	Soil Borrow Extraction/Levee Placement	Scraper	10	12			14,335 CY per day	May 17 to May 28
			Excavator	4	12				
			Dump Truck	84	12	0	0		
			Sheeps Foot Compactor	1	12				
			Bulldozer	2	12				
			Motor Grader	1	12				
			Water Truck	2	3				
			Worker Commute	20	12	1	22		
			Dust Emission	1.4	12				
	5	Wet Well Excavation/Installation	Crane	1	2				May 30 to May 31
			Front End Loader	1	1				
			Dump Truck	2	1	1	20		
			Worker Commute	2	2	1	22		
	6	Pump Station Installation	Crane	1	2				June 1 to June 2
			Front End Loader	1	2				
			Concrete Truck	1	1	1	20		
			Worker Commute	2	2	1	22		
	7	Trench Excavation & Forcemain Installation	Excavator	1	1			596 CY per day	June 3 to June 7
			Dump Truck	3	1	1	20		
			Front End Loader	1	1				
			Pipe Layer	1	5				
			Worker Commute	3	5	1	22		
			Dust Emission	0.1	5				
	1	Building Demo	Bulldozer	2	20				May 1 to May 20
			Front End Loader	2	20				
			Excavator	2	20				
			Haul Truck	1	2	13	20		
			Worker Commute	6	20	1	22		
			Dust Emission	1.9	2				
	1	Roadway Removal	Cold Planer	1	1				May 1
			Scraper	1	1				
			Dump Truck	1	1	17	20		
			Bulldozer	1	1				
			Excavator	1	1				
			Worker Commute	4	1	1	22		
	4	Roadway Replace	Dump Truck	13	3	14	20		July 14 to July 16
			Vibratory Compactor	2	3				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	3				
			Motor Grader	2	3				
			Bulldozer	2	3				
			Worker Commute	8	3	1	22		
	2	Stripping	Wheel Tractor Scraper	3	19			4.75 Ac per day	May 21 to June 13
			Bulldozer	1	24				
			Dump Truck	10	24	17	20		
			Excavator	1	24				
			Worker Commute	5	24	1	22		
			Dust Emission	4.7	24				
F									
	-	Levee Degrade	Scraper	0	0			21,456 CY per day	June 14 to July 13
			Bulldozer	0	0				
			Dump Truck	0	0				
			Excavator	0	0				
	3	Soil Borrow Extraction/Levee Placement	Scraper	14	30				
			Excavator	6	30				
			Dump Truck	117	30	0	0		
			Sheeps Foot Compactor	1	30				
			Bulldozer	2	30				
			Motor Grader	1	30				
			Water Truck	2	5				
			Worker Commute	26	30	1	22		
			Dust Emission	2.1	30				
	5	Rip Rap Installation	Crane	6	33				July 17 to August 18
			Bulldozer	3	33				
			Hydraulic Excavator	3	33				
			Towboat	1	33	1.5	180		
			Worker Commute	13	33	1	22		
	1	Existing Pump Station Removal	Bulldozer	1	2				May 1 to May 2
			Front End Loader	1	2				
			Excavator	1	2				
			Haul Truck	1	2	1	20		
			Worker Commute	3	2	1	22		
			Dust Emission	0.1	2				
	1	Building Demo	Bulldozer	1	3				May 1 to May 3
			Front End Loader	1	3				
			Excavator	1	3				
			Haul Truck	1	1	1	20		
			Worker Commute	3	3	1	22		
			Dust Emission	0.1	1				

	5	Roadway Replace	Dump Truck	8	1	15	20		June 8
			Vibratory Compactor	1	1				
			Asphalt Paver	0	0				
			Asphalt Compactor	0	0				
			Motor Grader	1	1				
			Bulldozer	1	1				
			Worker Commute	3	1	1	22		
	2	Stripping	Wheel Tractor Scraper	3	9			4.86 Ac per day	May 4 to May 14
			Bulldozer	1	11				
			Dump Truck	11	11	17	20		
			Excavator	1	11				
			Worker Commute	5	11	1	22		
			Dust Emission	4.9	11				
G	-	Levee Degrade	Scraper	0	0				May 15 to May 25
			Bulldozer	0	0				
			Dump Truck	0	0				
			Excavator	0	0				
	3	SB Cutoff Wall Installation	Dump Truck	3	11	53	0.25		
			Bulldozer	1	11				
			Long Reach Excavator	1	11				
			Hydraulic Excavator	1	11				
			ugh Terrain/Telehandler Fork	1	11				
			Worker Commute	4	11	1	22		
	4	Soil Borrow Extraction/Levee Placement	Scraper	10	13			14,526 CY per day	May 26 to June 7
			Excavator	4	13				
			Dump Truck	84	13	0	0		
			Sheeps Foot Compactor	1	13				
			Bulldozer	2	13				
			Motor Grader	1	13				
			Water Truck	2	3				
			Worker Commute	20	13	1	22		
			Dust Emission	1.5	13				
	6	Rip Rap Installation	Crane	4	21				June 9 to June 29
			Bulldozer	2	21				
			Hydraulic Excavator	2	21				
			Towboat	1	21	1.5	180		
			Worker Commute	9	21	1	22		
			Worker Commute	**20**	**109**	**1**	**22**		

CMA #1 PHASE 1 Off-Site Material Borrow Activities

Segment	Sequence Order	Construction Phase	Equipment	Number of Equipment	9 Hrs. Work Days	Daily Truck Trips	Roundtrip Miles	Daily Earthwork Rate (Dust Emissions)	Projected Time Frame
C	3	Off-Site Material Borrow	Scraper	6	38			21,537 CY per day	June 3 to July 10
			Excavator	6	38				
			Dump Truck	117	38	8	6.6		
			Sheeps Foot Compactor	0	38				
			Bulldozer	6	38				
			Motor Grader	0	38				
			Water Truck	2	6				
			Worker Commute	20	38	1	22		
			Dust Emission	2.2	38				
D	2	Off-Site Material Borrow	Scraper	6	8			14,539 CY per day	May 26 June 2
			Excavator	6	8				
			Dump Truck	84	8	8	6.6		
			Sheeps Foot Compactor	0	8				
			Bulldozer	6	8				
			Motor Grader	0	8				
			Water Truck	2	2				
			Worker Commute	20	8	1	22		
			Dust Emission	1.5	8				
E	1	Off-Site Material Borrow	Scraper	6	12			14,335 CY per day	May 17 to May 28
			Excavator	6	12				
			Dump Truck	84	12	8	6.6		
			Sheeps Foot Compactor	0	12				
			Bulldozer	6	12				
			Motor Grader	0	12				
			Water Truck	2	3				
			Worker Commute	20	12	1	22		
			Dust Emission	1.4	12				
F	4	Off-Site Material Borrow	Scraper	6	30			21,456 CY per day	June 14 to July 13
			Excavator	6	30				
			Dump Truck	117	30	8	6.6		
			Sheeps Foot Compactor	0	30				
			Bulldozer	6	30				
			Motor Grader	0	30				
			Water Truck	2	5				
			Worker Commute	20	30	1	22		
			Dust Emission	2.1	30				
G	2	Off-Site Material Borrow	Scraper	6	13			14,526 CY per day	May 26 to June 7
			Excavator	6	13				
			Dump Truck	84	13	8	6.6		
			Sheeps Foot Compactor	0	13				
			Bulldozer	6	13				
			Motor Grader	0	13				
			Water Truck	2	3				
			Worker Commute	20	13	1	22		
			Dust Emission	1.5	13				

SOUTHPORT SACRAMENTO RIVER EIP SITE
HIGH EMISSIONS ESTIMATE SUMMARY - (Unfavorable Scenario)
(Sequential Borrow Restoration)
CMA #2 PHASE 1 Project Site Related Activities

Segment	Sequence Order	Construction Phase	Equipment	Number of Equipment	9 Hrs. Work Days	Daily Truck Trips	Roundtrip Miles	Daily Earthwork Rate (Dust Emissions)	Projected Time Frame
C	1	Building Demo	Bulldozer	1	7				May 1 to May 7
			Front End Loader	1	7				
			Excavator	1	7				
			Haul Truck	1	1	3	20		
			Worker Commute	3	7	1	22		
			Dust Emission	0.4	1				
	1	Roadway Removal	Cold Planer	1	1				May 1
			Scraper	2	1				
			Dump Truck	7	1	15	20		
			Bulldozer	1	1				
			Excavator	1	1				
			Worker Commute	5	1	1	22		
	5	Roadway Replace	Dump Truck	11	2	15	20		September 10 to September 11
			Vibratory Compactor	1	2				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	2				
			Motor Grader	1	2				
			Bulldozer	1	2				
			Worker Commute	5	2	1	22		
	2	Stripping	Wheel Tractor Scraper	3	21			4.78 Ac per day	May 8 to June 3
			Bulldozer	1	27				
			Dump Truck	10	27	17	20		
			Excavator	1	27				
			Worker Commute	5	27	1	22		
			Dust Emission	4.8	27				
	3	Levee Degrade	Scraper	6	29			3,861 CY per day	June 4 to July 10
			Bulldozer	1	37				
			Dump Truck	10	36	17	20		
			Excavator	1	37				
			Worker Commute	8	37	1	22		
			Dust Emission	0.4	37				
	4	Soil Borrow Extraction/Levee Placement	Scraper	10	60			14,736 CY per day	July 11 to September 9
			Excavator	4	60				
			Dump Truck	42	60	0	0		
			Sheeps Foot Compactor	1	60				
			Bulldozer	2	60				
			Motor Grader	1	60				
			Water Truck	2	13				
			Worker Commute	20	60	1	22		
			Dust Emission	1.5	60				
	6	Rip Rap Installation	Crane	4	28				September 12 to October 9
			Bulldozer	2	28				
			Hydraulic Excavator	2	28				
			Towboat	1	28	1.5	180		
			Worker Commute	9	28	1	22		
D	1	Building Demo	Bulldozer	1	17				May 1 to May 17
			Front End Loader	1	17				
			Excavator	1	17				
			Haul Truck	1	1	7	20		
			Worker Commute	3	17	1	22		
			Dust Emission	1.0	1				
	1	Roadway Removal	Cold Planer	1	1				May 1
			Scraper	1	1				
			Dump Truck	3	1	15	20		
			Bulldozer	1	1				
			Excavator	1	1				
			Worker Commute	4	1	1	22		
	5	Roadway Replace	Dump Truck	13	3	14	20		June 20 to June 22
			Vibratory Compactor	1	3				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	3				
			Motor Grader	1	3				
			Bulldozer	1	3				
			Worker Commute	5	3	1	22		
	2	Stripping	Wheel Tractor Scraper	3	9			4.55 Ac per day	May 18 to May 28
			Bulldozer	1	11				
			Dump Truck	10	11	17	20		
			Excavator	1	11				
			Worker Commute	5	11	1	22		
			Dust Emission	4.5	11				
	-	Levee Degrade	Scraper	0	0				May 29 to June 4
			Bulldozer	0	0				
			Dump Truck	0	0				
			Excavator	0	0				
	3	SB Cutoff Wall Installation	Dump Truck	3	7	53	0.25		
			Bulldozer	1	7				
			Long Reach Excavator	1	7				
			Hydraulic Excavator	1	7				
			gh Terrain/Telehandler For	1	7				
			Worker Commute	4	7	1	22		
	4	Soil Borrow Extraction/Levee Placement	Scraper	10	15			14,077 CY per day	June 5 to June 19
			Excavator	4	15				
			Dump Truck	40	15	0	0		
			Sheeps Foot Compactor	1	15				
			Bulldozer	2	15				
			Motor Grader	1	15				
			Water Truck	2	3				
			Worker Commute	20	15	1	22		
			Dust Emission	1.4	15				

	6	Rip Rap Installation	Crane	4	6				June 23 to June 28
			Bulldozer	2	6				
			Hydraulic Excavator	2	6				
			Towboat	1	6	1.5	180		
			Worker Commute	9	6	1	22		
E	4	Roadway Replace	Dump Truck	14	3	14	20		June 9 to June 12
			Vibratory Compactor	2	4				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	4				
			Motor Grader	2	4				
			Bulldozer	2	4				
			Worker Commute	8	4	1	22		
	1	Stripping	Wheel Tractor Scraper	3	8			4.41 Ac per day	May 1 to May 10
			Bulldozer	1	10				
			Dump Truck	10	10	17	20		
			Excavator	1	10				
			Worker Commute	5	10	1	22		
			Dust Emission	4.4	10				
	-	Levee Degrade	Scraper	0	0				May 11 to May 21
			Bulldozer	0	0				
			Dump Truck	0	0				
			Excavator	0	0				
	2	SB Cutoff Wall Installation	Dump Truck	3	11	53	0.25		
			Bulldozer	1	11				
			Long Reach Excavator	1	11				
			Hydraulic Excavator	1	11				
			gh Terrain/Telehandler For	1	11				
			Worker Commute	4	11	1	22		
	3	Soil Borrow Extraction/Levee Placement	Scraper	10	18			14,928 CY per day	May 22 to June 8
			Excavator	9	18				
			Dump Truck	48	18	0	0		
			Sheeps Foot Compactor	1	18				
			Bulldozer	2	18				
			Motor Grader	1	18				
			Water Truck	2	4				
			Worker Commute	25	18	1	22		
			Dust Emission	1.5	18				
	5	Wet Well Excavation/Installation	Crane	1	2				June 13 to June 14
			Front End Loader	1	1				
			Dump Truck	2	1	1	20		
			Worker Commute	2	2	1	22		
	6	Pump Station Installation	Crane	1	2				June 15 to June 16
			Front End Loader	1	2				
			Concrete Truck	1	1	1	20		
			Worker Commute	2	2	1	22		
	7	Trench Excavation & Forcemain Installation	Excavator	1	1			596 CY per day	June 17 to June 21
			Dump Truck	3	1	1	20		
			Front End Loader	1	1				
			Pipe Layer	1	5				
			Worker Commute	3	5	1	22		
			Dust Emission	0.1	5				
F	1	Building Demo	Bulldozer	2	30				May 1 to May 30
			Front End Loader	2	30				
			Excavator	2	30				
			Haul Truck	1	2	13	20		
			Worker Commute	6	30	1	22		
			Dust Emission	1.9	2				
	1	Roadway Removal	Cold Planer	1	1				May 1
			Scraper	2	1				
			Dump Truck	7	1	15	20		
			Bulldozer	1	1				
			Excavator	1	1				
			Worker Commute	5	1	1	22		
	5	Roadway Replace	Dump Truck	14	3	14	20		October 12 to October 15
			Vibratory Compactor	2	4				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	4				
			Motor Grader	2	4				
			Bulldozer	2	4				
			Worker Commute	8	4	1	22		
	2	Stripping	Wheel Tractor Scraper	3	23			4.78 Ac per day	May 31 to June 28
			Bulldozer	1	29				
			Dump Truck	10	29	17	20		
			Excavator	1	29				
			Worker Commute	5	29	1	22		
			Dust Emission	4.8	29				
	3	Levee Degrade	Scraper	6	36			3,896 CY per day	June 29 to August 12
			Bulldozer	1	45				
			Dump Truck	10	45	17	20		
			Excavator	1	45				
			Worker Commute	8	45	1	22		
			Dust Emission	0.4	45				
	4	Soil Borrow Extraction/Levee Placement	Scraper	10	60			14,779 CY per day	August 13 to October 11
			Excavator	4	60				
			Dump Truck	40	60	0	0		
			Sheeps Foot Compactor	1	60				
			Bulldozer	2	60				
			Motor Grader	1	60				
			Water Truck	2	12				
			Worker Commute	20	60	1	22		
			Dust Emission	1.5	60				
	6	Rip Rap Installation	Crane	4	17				October 16 to November 1
			Bulldozer	2	17				
			Hydraulic Excavator	2	17				
			Towboat	1	17	1.5	180		
			Worker Commute	9	17	1	22		

	1	Existing Pump Station Removal	Bulldozer	1	2				May 1 to May 2
			Front End Loader	1	2				
			Excavator	1	2				
			Haul Truck	1	2	1	20		
			Worker Commute	3	2	1	22		
			Dust Emission	0.1	2				
G	1	Building Demo	Bulldozer	1	5				May 1 to May 5
			Front End Loader	1	5				
			Excavator	1	5				
			Haul Truck	1	1	1	20		
			Worker Commute	3	5	1	22		
			Dust Emission	0.1	1				
	5	Roadway Replace	Dump Truck	8	1	14	20		June 5
			Vibratory Compactor	1	1				
			Asphalt Paver	0	0				
			Asphalt Compactor	0	0				
			Motor Grader	1	1				
			Bulldozer	1	1				
			Worker Commute	3	1	1	22		
	2	Stripping	Wheel Tractor Scraper	3	8			4.40 Ac per day	May 6 to May 15
			Bulldozer	1	10				
			Dump Truck	10	10	17	20		
			Excavator	1	10				
			Worker Commute	5	10	1	22		
			Dust Emission	4.4	10				
	-	Levee Degrade	Scraper	0	0				May 16 to May 25
			Bulldozer	0	0				
			Dump Truck	0	0				
			Excavator	0	0				
	3	SB Cutoff Wall Installation	Dump Truck	3	10	53	0.25		
			Bulldozer	1	10				
			Long Reach Excavator	1	10				
			Hydraulic Excavator	1	10				
			gh Terrain/Telehandler For	1	10				
			Worker Commute	4	10	1	22		
	4	Soil Borrow Extraction/Levee Placement	Scraper	10	10			14,235 CY per day	May 26 to June 4
			Excavator	9	10				
			Dump Truck	48	10	0	0		
			Sheeps Foot Compactor	1	10				
			Bulldozer	2	10				
			Motor Grader	1	10				
			Water Truck	2	2				
			Worker Commute	25	10	1	22		
			Dust Emission	1.4	10				
	6	Rip Rap Installation	Crane	4	21				June 6 to June 26
			Bulldozer	2	21				
			Hydraulic Excavator	2	21				
			Towboat	1	21	1.5	180		
			Worker Commute	9	21	1	22		
			Worker Commute	**20**	**174**	**1**	**22**		

CMA #2 PHASE 1 Off-Site Material Borrow Activities

Segment	Sequence Order	Construction Phase	Equipment	Number of Equipment	9 Hrs. Work Days	Daily Truck Trips	Roundtrip Miles	Daily Earthwork Rate (Dust Emissions)	Projected Time Frame
C	4	Off-Site Material Borrow	Scraper	6	60			14,736 CY per day	July 11 to September 9
			Excavator	6	60				
			Dump Truck	42	60	16	6.6		
			Sheeps Foot Compactor	0	60				
			Bulldozer	6	60				
			Motor Grader	0	60				
			Water Truck	2	13				
			Worker Commute	20	60	1	22		
			Dust Emission	1.5	60				
D	3	Off-Site Material Borrow	Scraper	6	15			14,077 CY per day	June 5 to June 19
			Excavator	6	15				
			Dump Truck	40	15	16	6.6		
			Sheeps Foot Compactor	0	15				
			Bulldozer	6	15				
			Motor Grader	0	15				
			Water Truck	2	3				
			Worker Commute	20	15	1	22		
			Dust Emission	1.4	15				
E	1	Off-Site Material Borrow	Scraper	6	18			14,928 CY per day	May 22 to June 8
			Excavator	6	18				
			Dump Truck	48	18	16	6.6		
			Sheeps Foot Compactor	0	18				
			Bulldozer	6	18				
			Motor Grader	0	18				
			Water Truck	2	4				
			Worker Commute	20	18	1	22		
			Dust Emission	1.5	18				
F	5	Off-Site Material Borrow	Scraper	6	60			14,779 CY per day	August 13 to October 11
			Excavator	6	60				
			Dump Truck	40	60	16	6.6		
			Sheeps Foot Compactor	0	60				
			Bulldozer	6	60				
			Motor Grader	0	60				
			Water Truck	2	12				
			Worker Commute	20	60	1	22		
			Dust Emission	1.5	60				
G	2	Off-Site Material Borrow	Scraper	6	10			14,235 CY per day	May 26 to June 4
			Excavator	6	10				
			Dump Truck	48	10	16	6.6		
			Sheeps Foot Compactor	0	10				
			Bulldozer	6	10				
			Motor Grader	0	10				
			Water Truck	2	2				
			Worker Commute	20	10	1	22		
			Dust Emission	1.4	10				

SOUTHPORT SACRAMENTO RIVER EIP SITE
HIGH EMISSIONS ESTIMATE SUMMARY - (Unfavorable Scenario)

CMA #3 PHASE 1 Project Site Related Activities

Segment	Sequence Order	Construction Phase	Equipment	Number of Equipment	9 Hrs. Work Days	Daily Truck Trips	Roundtrip Miles	Daily Earthwork Rate (Dust Emissions)	Projected Time Frame
C	1	Roadway Removal	Cold Planer	1	1				May 1
			Scraper	2	1				
			Dump Truck	6	1	17	20		
			Bulldozer	1	1				
			Excavator	1	1				
			Worker Commute	5	1	1	22		
	4	Roadway Replace	Dump Truck	14	1	17	20		June 29
			Vibratory Compactor	1	1				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	1				
			Motor Grader	1	1				
			Bulldozer	1	1				
			Worker Commute	5	1	1	22		
	2	Stripping	Wheel Tractor Scraper	3	13			4.44 Ac per day	May 2 to May 19
			Bulldozer	1	18				
			Dump Truck	10	18	17	20		
			Excavator	1	18				
			Worker Commute	5	18	1	22		
			Dust Emission	4.4	18				
	-	Levee Degrade	Scraper	0	0			14,470 CY per day	May 20 to June 28
			Bulldozer	0	0				
			Dump Truck	0	0				
			Excavator	0	0				
	3	Soil Borrow Extraction/Levee Placement	Scraper	10	40				
			Excavator	4	40				
			Dump Truck	84	40	0	0		
			Sheeps Foot Compactor	1	40				
			Bulldozer	2	40				
			Motor Grader	1	40				
			Water Truck	2	8				
			Worker Commute	20	40	1	22		
			Dust Emission	1.4	40				
	5	Rip Rap Installation	Crane	6	87				June 30 to September 24
			Bulldozer	3	87				
			Hydraulic Excavator	3	87				
			Towboat	1	87	1.5	180		
			Worker Commute	13	87	1	22		
D	1	Building Demo	Bulldozer	1	5				May 1 to May 5
			Front End Loader	1	5				
			Excavator	1	5				
			Haul Truck	1	1	2	20		
			Worker Commute	3	5	1	22		
			Dust Emission	0.3	1				
	1	Roadway Removal	Cold Planer	1	1				May 1
			Scraper	1	1				
			Dump Truck	3	1	17	20		
			Bulldozer	1	1				
			Excavator	1	1				
			Worker Commute	4	1	1	22		
	6	Roadway Replace	Dump Truck	16	2	17	20		June 12 to June 13
			Vibratory Compactor	1	2				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	2				
			Motor Grader	1	2				
			Bulldozer	1	2				
			Worker Commute	5	2	1	22		
	2	Stripping	Wheel Tractor Scraper	3	4			4.75 Ac per day	May 6 to May 9
			Bulldozer	1	4				
			Dump Truck	10	4	17	20		
			Excavator	1	4				
			Worker Commute	5	4	1	22		
			Dust Emission	4.8	4				
	3	Levee Degrade	Scraper	17	6			3,876 CY per day	May 10 to May 31
			Bulldozer	1	22				
			Dump Truck	10	22	17	20		
			Excavator	1	22				
			Worker Commute	19	22	1	22		
			Dust Emission	0.4	22				
	4	SB Cutoff Wall Installation	Dump Truck	3	2	53	0.25		June 1 to June 2
			Bulldozer	1	2				
			Long Reach Excavator	1	2				
			Hydraulic Excavator	1	2				
			gh Terrain/Telehandler Fo	1	2				
			Worker Commute	4	2	1	22		
	5	Soil Borrow Extraction/Levee Placement	Scraper	10	9			14,395 CY per day	June 3 to June 11
			Excavator	4	9				
			Dump Truck	84	9	0	0		
			Sheeps Foot Compactor	1	9				
			Bulldozer	2	9				
			Motor Grader	1	9				
			Water Truck	2	2				
			Worker Commute	20	9	1	22		
			Dust Emission	1.4	9				
	7	Rip Rap Installation	Crane	2	62				June 14 to August 14
			Bulldozer	1	62				
			Hydraulic Excavator	1	62				
			Towboat	1	62	1.5	180		
			Worker Commute	5	62	1	22		
	5	Roadway Replace	Dump Truck	17	2	17	20		July 4 to July 5
			Vibratory Compactor	2	2				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	2				
			Motor Grader	2	2				
			Bulldozer	2	2				
			Worker Commute	8	2	1	22		

	1	Stripping	Wheel Tractor Scraper	3	4			4.08 Ac per day	May 1 to May 6
			Bulldozer	1	6				
			Dump Truck	10	6	17	20		
			Excavator	1	6				
			Worker Commute	5	6	1	22		
			Dust Emission	4.1	6				
	2	Levee Degrade	Scraper	17	10			3,861 CY per day	May 7 to June 10
			Bulldozer	1	35				
			Dump Truck	10	35	17	20		
			Excavator	1	35				
			Worker Commute	19	35	1	22		
			Dust Emission	0.4	35				
	3	SB Cutoff Wall Installation	Dump Truck	3	9	53	0.25		June 11 to June 19
			Bulldozer	1	9				
			Long Reach Excavator	1	9				
			Hydraulic Excavator	1	9				
			gh Terrain/Telehandler Fo	1	9				
			Worker Commute	4	9	1	22		
E	4	Soil Borrow Extraction/Levee Placement	Scraper	10	14			13,603 CY per day	June 20 to July 3
			Excavator	4	14				
			Dump Truck	84	14	0	0		
			Sheeps Foot Compactor	1	14				
			Bulldozer	2	14				
			Motor Grader	1	14				
			Water Truck	2	3				
			Worker Commute	20	14	1	22		
			Dust Emission	1.4	14				
	8	Rip Rap Installation	Crane	4	59				July 10 to September 7
			Bulldozer	2	59				
			Hydraulic Excavator	2	59				
			Towboat	1	59	1.5	180		
			Worker Commute	9	59	1	22		
	6	Wet Well Excavation/Installation	Crane	1	2				July 6 to July 7
			Front End Loader	1	1				
			Dump Truck	2	1	1	20		
			Worker Commute	2	2	1	22		
	7	Pump Station Installation	Crane	1	2				July 8 to July 9
			Front End Loader	1	2				
			Concrete Truck	1	1	1	20		
			Worker Commute	2	2	1	22		
	8	Trench Excavation & Forcemain Installation	Excavator	1	1			596 CY per day	July 10 to July 14
			Dump Truck	3	1	1	20		
			Front End Loader	1	1				
			Pipe Layer	1	5				
			Worker Commute	3	5	1	22		
			Dust Emission	0.1	5				
	1	Building Demo	Bulldozer	2	18				May 1 to May 18
			Front End Loader	2	18				
			Excavator	2	18				
			Haul Truck	1	2	13	20		
			Worker Commute	6	18	1	22		
			Dust Emission	1.9	2				
	1	Roadway Removal	Cold Planer	1	1				May 1
			Scraper	2	1				
			Dump Truck	6	1	17	20		
			Bulldozer	1	1				
			Excavator	1	1				
			Worker Commute	5	1	1	22		
	4	Roadway Replace	Dump Truck	17	2	17	20		June 29 to June 30
			Vibratory Compactor	2	2				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	2				
			Motor Grader	2	2				
			Bulldozer	2	2				
			Worker Commute	8	2	1	22		
	2	Stripping	Wheel Tractor Scraper	3	4			4.24 Ac per day	May 19 to May 23
			Bulldozer	1	5				
			Dump Truck	10	5	17	20		
			Excavator	1	5				
			Worker Commute	5	5	1	22		
			Dust Emission	4.2	5				
F	-	Levee Degrade	Scraper	0	0			14,549 CY per day	May 24 to June 28
			Bulldozer	0	0				
			Dump Truck	0	0				
			Excavator	0	0				
	3	Soil Borrow Extraction/Levee Placement	Scraper	10	36				
			Excavator	4	36				
			Dump Truck	84	36	0	0		
			Sheeps Foot Compactor	1	36				
			Bulldozer	2	36				
			Motor Grader	1	36				
			Water Truck	2	8				
			Worker Commute	20	36	1	22		
			Dust Emission	1.5	36				
	5	Rip Rap Installation	Crane	6	74				July 1 to September 12
			Bulldozer	3	74				
			Hydraulic Excavator	3	74				
			Towboat	1	74	1.5	180		
			Worker Commute	13	74	1	22		
	1	Existing Pump Station Removal	Bulldozer	1	2				May 1 to May 2
			Front End Loader	1	2				
			Excavator	1	2				
			Haul Truck	1	2	1	20		
			Worker Commute	3	2	1	22		
			Dust Emission	0.1	2				

G	1	Building Demo	Bulldozer	1	5				May 1 to May 5
			Front End Loader	1	5				
			Excavator	1	5				
			Haul Truck	1	1	1	20		
			Worker Commute	3	5	1	22		
			Dust Emission	0.1	1				
	6	Roadway Replace	Dump Truck	12	1	17	20		June 24
			Vibratory Compactor	1	1				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	1				
			Motor Grader	1	1				
			Bulldozer	1	1				
			Worker Commute	5	1	1	22		
	2	Stripping	Wheel Tractor Scraper	3	4			4.20 Ac per day	May 6 to May 10
			Bulldozer	1	5				
			Dump Truck	10	5	17	20		
			Excavator	1	5				
			Worker Commute	5	5	1	22		
			Dust Emission	4.2	5				
	3	Levee Degrade	Scraper	17	7			3,930 CY per day	May 11 to June 4
			Bulldozer	1	25				
			Dump Truck	10	25	17	20		
			Excavator	1	25				
			Worker Commute	19	25	1	22		
			Dust Emission	0.4	25				
	4	SB Cutoff Wall Installation	Dump Truck	3	9	53	0.25		June 5 to June 13
			Bulldozer	1	9				
			Long Reach Excavator	1	9				
			Hydraulic Excavator	1	9				
			gh Terrain/Telehandler Fo	1	9				
			Worker Commute	4	9	1	22		
	5	Soil Borrow Extraction/Levee Placement	Scraper	10	10			14,721 CY per day	June 14 to June 23
			Excavator	4	10				
			Dump Truck	84	10	0	0		
			Sheeps Foot Compactor	1	10				
			Bulldozer	2	10				
			Motor Grader	1	10				
			Water Truck	2	2				
			Worker Commute	20	10	1	22		
			Dust Emission	1.5	10				
	7	Rip Rap Installation	Crane	4	43				June 25 to August 6
			Bulldozer	2	43				
			Hydraulic Excavator	2	43				
			Towboat	1	43	1.5	180		
			Worker Commute	9	43	1	22		
			Worker Commute	**20**	**146**	**1**	**22**		

CMA #3 PHASE 1 Off-Site Material Borrow Activities

Segment	Sequence Order	Construction Phase	Equipment	Number of Equipment	9 Hrs. Work Days	Daily Truck Trips	Roundtrip Miles	Daily Earthwork Rate (Dust Emissions)	Projected Time Frame
C	1	Off-Site Material Borrow	Scraper	6	40			14,470 CY per day	May 20 to June 28
			Excavator	6	40				
			Dump Truck	84	40	8	6.6		
			Sheeps Foot Compactor	0	40				
			Bulldozer	6	40				
			Motor Grader	0	40				
			Water Truck	2	8				
			Worker Commute	20	40	1	22		
			Dust Emission	1.4	40				
D	3	Off-Site Material Borrow	Scraper	6	9			14,395 CY per day	June 3 to June 11
			Excavator	6	9				
			Dump Truck	84	9	8	6.6		
			Sheeps Foot Compactor	0	9				
			Bulldozer	6	9				
			Motor Grader	0	9				
			Water Truck	2	2				
			Worker Commute	20	9	1	22		
			Dust Emission	1.4	9				
E	5	Off-Site Material Borrow	Scraper	6	14			13,603 CY per day	June 20 to July 3
			Excavator	6	14				
			Dump Truck	84	14	8	6.6		
			Sheeps Foot Compactor	0	14				
			Bulldozer	6	14				
			Motor Grader	0	14				
			Water Truck	2	3				
			Worker Commute	20	14	1	22		
			Dust Emission	1.4	14				
F	2	Off-Site Material Borrow	Scraper	6	36			14,549 CY per day	May 24 to June 28
			Excavator	6	36				
			Dump Truck	84	36	8	6.6		
			Sheeps Foot Compactor	0	36				
			Bulldozer	6	36				
			Motor Grader	0	36				
			Water Truck	2	8				
			Worker Commute	20	36	1	22		
			Dust Emission	1.5	36				
G	4	Off-Site Material Borrow	Scraper	6	10			14,721 CY per day	June 14 to June 23
			Excavator	6	10				
			Dump Truck	84	10	8	6.6		
			Sheeps Foot Compactor	0	10				
			Bulldozer	6	10				
			Motor Grader	0	10				
			Water Truck	2	2				
			Worker Commute	20	10	1	22		
			Dust Emission	1.5	10				

SOUTHPORT SACRAMENTO RIVER EIP SITE
HIGH EMISSIONS ESTIMATE SUMMARY - (Unfavorable Scenario)
(Sequential Borrow Restoration)
CMA #4 PHASE 1 Project Site Related Activities

Segment	Sequence Order	Construction Phase	Equipment	Number of Equipment	9 Hrs. Work Days	Daily Truck Trips	Roundtrip Miles	Daily Earthwork Rate (Dust Emissions)	Projected Time Frame
C	1	Building Demo	Bulldozer	1	7				May 1 to May 7
			Front End Loader	1	7				
			Excavator	1	7				
			Haul Truck	1	1	3	20		
			Worker Commute	3	7	1	22		
			Dust Emission	0.4	1				
	1	Roadway Removal	Cold Planer	1	1				May 1
			Scraper	2	1				
			Dump Truck	7	1	15	20		
			Bulldozer	1	1				
			Excavator	1	1				
			Worker Commute	5	1	1	22		
	5	Roadway Replace	Dump Truck	11	2	15	20		September 10 to September 11
			Vibratory Compactor	1	2				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	2				
			Motor Grader	1	2				
			Bulldozer	1	2				
			Worker Commute	5	2	1	22		
	2	Stripping	Wheel Tractor Scraper	3	21			4.78 Ac per day	May 8 to June 3
			Bulldozer	1	27				
			Dump Truck	10	27	17	20		
			Excavator	1	27				
			Worker Commute	5	27	1	22		
			Dust Emission	4.8	27				
	3	Levee Degrade	Scraper	6	29			3,861 CY per day	June 4 to July 10
			Bulldozer	1	37				
			Dump Truck	10	36	17	20		
			Excavator	1	37				
			Worker Commute	8	37	1	22		
			Dust Emission	0.4	37				
	4	Soil Borrow Extraction/Levee Placement	Scraper	10	60			14,736 CY per day	July 11 to September 9
			Excavator	4	60				
			Dump Truck	42	60	0	0		
			Sheeps Foot Compactor	1	60				
			Bulldozer	2	60				
			Motor Grader	1	60				
			Water Truck	2	13				
			Worker Commute	20	60	1	22		
			Dust Emission	1.5	60				
	6	Rip Rap Installation	Crane	4	28				September 12 to October 9
			Bulldozer	2	28				
			Hydraulic Excavator	2	28				
			Towboat	1	28	1.5	180		
			Worker Commute	9	28	1	22		
D	1	Building Demo	Bulldozer	1	17				May 1 to May 17
			Front End Loader	1	17				
			Excavator	1	17				
			Haul Truck	1	1	7	20		
			Worker Commute	3	17	1	22		
			Dust Emission	1.0	1				
	1	Roadway Removal	Cold Planer	1	1				May 1
			Scraper	1	1				
			Dump Truck	3	1	15	20		
			Bulldozer	1	1				
			Excavator	1	1				
			Worker Commute	4	1	1	22		
	5	Roadway Replace	Dump Truck	13	3	14	20		June 20 to June 22
			Vibratory Compactor	1	3				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	3				
			Motor Grader	1	3				
			Bulldozer	1	3				
			Worker Commute	5	3	1	22		
	2	Stripping	Wheel Tractor Scraper	3	9			4.55 Ac per day	May 18 to May 28
			Bulldozer	1	11				
			Dump Truck	10	11	17	20		
			Excavator	1	11				
			Worker Commute	5	11	1	22		
			Dust Emission	4.5	11				
	-	Levee Degrade	Scraper	0	0				May 29 to June 4
			Bulldozer	0	0				
			Dump Truck	0	0				
			Excavator	0	0				
	3	SB Cutoff Wall Installation	Dump Truck	3	7	53	0.25		
			Bulldozer	1	7				
			Long Reach Excavator	1	7				
			Hydraulic Excavator	1	7				
			gh Terrain/Telehandler For	1	7				
			Worker Commute	4	7	1	22		
	4	Soil Borrow Extraction/Levee Placement	Scraper	10	15			14,077 CY per day	June 5 to June 19
			Excavator	4	15				
			Dump Truck	40	60	0	0		
			Sheeps Foot Compactor	1	15				
			Bulldozer	2	15				
			Motor Grader	1	15				
			Water Truck	2	3				
			Worker Commute	20	60	1	22		
			Dust Emission	1.4	60				

	6	Rip Rap Installation	Crane	4	6				June 23 to June 28
			Bulldozer	2	6				
			Hydraulic Excavator	2	6				
			Towboat	1	6	1.5	180		
			Worker Commute	9	6	1	22		
	4	Roadway Replace	Dump Truck	14	3	14	20		June 9 to June 12
			Vibratory Compactor	2	4				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	4				
			Motor Grader	2	4				
			Bulldozer	2	4				
			Worker Commute	8	4	1	22		
	1	Stripping	Wheel Tractor Scraper	3	8			4.41 Ac per day	May 1 to May 10
			Bulldozer	1	10				
			Dump Truck	10	10	17	20		
			Excavator	1	10				
			Worker Commute	5	10	1	22		
			Dust Emission	4.4	10				
	-	Levee Degrade	Scraper	0	0				May 11 to May 21
			Bulldozer	0	0				
			Dump Truck	0	0				
			Excavator	0	0				
	2	SB Cutoff Wall Installation	Dump Truck	3	11	53	0.25		
			Bulldozer	1	11				
			Long Reach Excavator	1	11				
			Hydraulic Excavator	1	11				
			gh Terrain/Telehandler For	1	11				
			Worker Commute	4	11	1	22		
E	3	Soil Borrow Extraction/Levee Placement	Scraper	10	18			14,928 CY per day	May 22 to June 8
			Excavator	9	18				
			Dump Truck	48	18	0	0		
			Sheeps Foot Compactor	1	18				
			Bulldozer	2	18				
			Motor Grader	1	18				
			Water Truck	2	4				
			Worker Commute	25	18	1	22		
			Dust Emission	1.5	18				
	5	Wet Well Excavation/Installatio n	Crane	1	2				June 13 to June 14
			Front End Loader	1	1				
			Dump Truck	2	1	1	20		
			Worker Commute	2	2	1	22		
	6	Pump Station Installation	Crane	1	2				June 15 to June 16
			Front End Loader	1	2				
			Concrete Truck	1	1	1	20		
			Worker Commute	2	2	1	22		
	7	Trench Excavation & Forcemain Installation	Excavator	1	1			596 CY per day	June 17 to June 21
			Dump Truck	3	1	1	20		
			Front End Loader	1	1				
			Pipe Layer	1	5				
			Worker Commute	3	5	1	22		
			Dust Emission	0.1	5				
	1	Building Demo	Bulldozer	2	30				May 1 to May 30
			Front End Loader	2	30				
			Excavator	2	30				
			Haul Truck	1	2	13	20		
			Worker Commute	6	30	1	22		
			Dust Emission	1.9	2				
	1	Roadway Removal	Cold Planer	1	1				May 1
			Scraper	2	1				
			Dump Truck	7	1	15	20		
			Bulldozer	1	1				
			Excavator	1	1				
			Worker Commute	5	1	1	22		
	4	Roadway Replace	Dump Truck	14	3	14	20		July 28 to July 31
			Vibratory Compactor	2	4				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	4				
			Motor Grader	2	4				
			Bulldozer	2	4				
			Worker Commute	8	4	1	22		
	2	Stripping	Wheel Tractor Scraper	3	23			4.78 Ac per day	May 31 to June 28
			Bulldozer	1	29				
			Dump Truck	10	29	17	20		
			Excavator	1	29				
			Worker Commute	5	29	1	22		
			Dust Emission	4.8	29				
F	3	Levee Degrade	Scraper	0	0			22,196 CY per day	June 29 to July 27
			Bulldozer	0	0				
			Dump Truck	0	0				
			Excavator	0	0				
		Soil Borrow Extraction/Levee Placement	Scraper	14	29				
			Excavator	6	29				
			Dump Truck	40	29	0	0		
			Sheeps Foot Compactor	1	29				
			Bulldozer	2	29				
			Motor Grader	1	29				
			Water Truck	2	5				
			Worker Commute	26	29	1	22		
			Dust Emission	2.2	29				
	5	Rip Rap Installation	Crane	10	20				August 1 to August 20
			Bulldozer	5	20				
			Hydraulic Excavator	5	20				
			Towboat	1	20	1.5	180		
			Worker Commute	21	20	1	22		
	1	Existing Pump Station Removal	Bulldozer	1	2				May 1 to May 2
			Front End Loader	1	2				
			Excavator	1	2				
			Haul Truck	1	2	1	20		
			Worker Commute	3	2	1	22		
			Dust Emission	0.1	2				

G	1	Building Demo	Bulldozer	1	5				May 1 to May 5
			Front End Loader	1	5				
			Excavator	1	5				
			Haul Truck	1	1	1	20		
			Worker Commute	3	5	1	22		
			Dust Emission	0.1	1				
	5	Roadway Replace	Dump Truck	8	1	14	20		June 5
			Vibratory Compactor	1	1				
			Asphalt Paver	0	0				
			Asphalt Compactor	0	0				
			Motor Grader	1	1				
			Bulldozer	1	1				
			Worker Commute	3	1	1	22		
	2	Stripping	Wheel Tractor Scraper	3	8			4.40 Ac per day	May 6 to May 15
			Bulldozer	1	10				
			Dump Truck	10	10	17	20		
			Excavator	1	10				
			Worker Commute	5	10	1	22		
			Dust Emission	4.4	10				
	-	Levee Degrade	Scraper	0	0				May 16 to May 25
			Bulldozer	0	0				
			Dump Truck	0	0				
			Excavator	0	0				
	3	SB Cutoff Wall Installation	Dump Truck	3	10	53	0.25		
			Bulldozer	1	10				
			Long Reach Excavator	1	10				
			Hydraulic Excavator	1	10				
			gh Terrain/Telehandler For	1	10				
			Worker Commute	4	10	1	22		
	4	Soil Borrow Extraction/Levee Placement	Scraper	10	10			14,235 CY per day	May 26 to June 4
			Excavator	9	10				
			Dump Truck	48	10	0	0		
			Sheeps Foot Compactor	1	10				
			Bulldozer	2	10				
			Motor Grader	1	10				
			Water Truck	2	2				
			Worker Commute	25	10	1	22		
			Dust Emission	1.4	10				
	6	Rip Rap Installation	Crane	8	10				June 6 to June 15
			Bulldozer	4	10				
			Hydraulic Excavator	4	10				
			Towboat	1	10	1.5	180		
			Worker Commute	17	10	1	22		
			Worker Commute	**20**	**161**	**1**	**22**		

CMA #4 PHASE 1 Off-Site Material Borrow Activities

Segment	Sequence Order	Construction Phase	Equipment	Number of Equipment	9 Hrs. Work Days	Daily Truck Trips	Roundtrip Miles	Daily Earthwork Rate (Dust Emissions)	Projected Time Frame
C	4	Off-Site Material Borrow	Scraper	6	60			14,736 CY per day	July 11 to September 9
			Excavator	6	60				
			Dump Truck	42	60	16	6.6		
			Sheeps Foot Compactor	0	60				
			Bulldozer	6	60				
			Motor Grader	0	60				
			Water Truck	2	13				
			Worker Commute	20	60	1	22		
			Dust Emission	1.5	60				
D	3	Off-Site Material Borrow	Scraper	6	15			14,077 CY per day	June 5 to June 19
			Excavator	6	15				
			Dump Truck	40	15	17	6.6		
			Sheeps Foot Compactor	0	15				
			Bulldozer	6	15				
			Motor Grader	0	15				
			Water Truck	2	3				
			Worker Commute	20	15	1	22		
			Dust Emission	1.4	15				
E	1	Off-Site Material Borrow	Scraper	6	18			14,928 CY per day	May 22 to June 8
			Excavator	6	18				
			Dump Truck	48	18	14	6.6		
			Sheeps Foot Compactor	0	18				
			Bulldozer	6	18				
			Motor Grader	0	18				
			Water Truck	2	4				
			Worker Commute	20	18	1	22		
			Dust Emission	1.5	18				
F	5	Off-Site Material Borrow	Scraper	6	29			22,196 CY per day	June 29 to July 27
			Excavator	6	29				
			Dump Truck	40	29	17	6.6		
			Sheeps Foot Compactor	0	29				
			Bulldozer	6	29				
			Motor Grader	0	29				
			Water Truck	2	5				
			Worker Commute	20	29	1	22		
			Dust Emission	2.2	29				
G	2	Off-Site Material Borrow	Scraper	6	10			14,235 CY per day	May 26 to June 4
			Excavator	6	10				
			Dump Truck	48	10	14	6.6		
			Sheeps Foot Compactor	0	10				
			Bulldozer	6	10				
			Motor Grader	0	10				
			Water Truck	2	2				
			Worker Commute	20	10	1	22		
			Dust Emission	1.4	10				

2014 Daily Vehicle Trips on Local Streets (both Project Site Related and Off-Site Material Borr

Alternative/Segment/Construction Phase	4/27/2014 - 5/3/2014	5/4/2014 5/10/2014	5/11/2014 - 5/17/2014	5/18/2014 - 5/24/2014	5/25/2014 - 5/31/2014	6/1/2014 - 6/7/2014	6/8/2014 - 6/14/2014	6/15/2014 - 6/21/2014	6/22/2014 - 6/28/2014	6/29/2014 - 7/5/2014	7/6/2014 - 7/12/2014	7/13/2014 - 7/19/2014	7/20/2014 - 7/26/2014	7/27/2014 - 8/2/2014	8/3/2014 - 8/9/2014	8/10/2014 - 8/16/2014	8/17/2014 - 8/23/2014	8/24/2014 - 8/30/2014	8/31/2014 - 9/6/2014
Alternative 1 Phase 2 - Unfavorable	***380.0***	***124.0***	***124.0***	***124.0***	***452.0***	***398.0***	***430.0***	***430.0***	***826.0***	***106.0***	***106.0***	***106.0***	***80.0***	***80.0***	***80.0***	***80.0***	***446.0***	***66.0***	***66.0***
A	202.0	22.0	22.0	22.0	350.0	8.0	40.0	40.0	436.0	26.0	26.0	26.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B	138.0	62.0	62.0	62.0	62.0	350.0	350.0	350.0	350.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	406.0	26.0	26.0
Additional Workforce	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Electricity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alternative 2 Phase 2 - Unfavorable	***496.0***	***122.0***	***122.0***	***122.0***	***740.0***	***740.0***	***740.0***	***746.0***	***752.0***	***752.0***	***752.0***	***752.0***	***752.0***	***404.0***	***446.0***	***446.0***	***446.0***	***98.0***	***130.0***
A	198.0	38.0	38.0	38.0	350.0	350.0	350.0	356.0	356.0	356.0	356.0	356.0	356.0	356.0	356.0	356.0	356.0	8.0	40.0
B	258.0	44.0	44.0	44.0	350.0	350.0	350.0	350.0	356.0	356.0	356.0	356.0	356.0	8.0	50.0	50.0	50.0	50.0	50.0
A-B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Additional Workforce	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Electricity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alternative 3 Phase 2 - Unfavorable	***496.0***	***452.0***	***452.0***	***480.0***	***480.0***	***768.0***	***458.0***	***458.0***	***458.0***	***88.0***	***88.0***	***514.0***	***694.0***	***92.0***	***92.0***	***92.0***	***92.0***	***92.0***	***92.0***
A	180.0	350.0	350.0	378.0	378.0	378.0	378.0	378.0	378.0	8.0	8.0	8.0	628.0	26.0	26.0	26.0	26.0	26.0	26.0
B	276.0	62.0	62.0	62.0	62.0	350.0	40.0	40.0	40.0	40.0	40.0	466.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
Additional Workforce	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Electricity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alternative 4 Phase 2 - Unfavorable	***442.0***	***122.0***	***122.0***	***428.0***	***740.0***	***740.0***	***740.0***	***746.0***	***752.0***	***752.0***	***752.0***	***752.0***	***752.0***	***454.0***	***446.0***	***446.0***	***98.0***	***98.0***	***130.0***
A	198.0	38.0	38.0	38.0	350.0	350.0	350.0	356.0	356.0	356.0	356.0	356.0	356.0	356.0	356.0	356.0	8.0	8.0	40.0
B	204.0	44.0	44.0	350.0	350.0	350.0	350.0	350.0	356.0	356.0	356.0	356.0	356.0	58.0	50.0	50.0	50.0	50.0	50.0
A-B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Additional Workforce	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Electricity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2014 Daily Vehicle Trips on Local Streets from Off-Site Material Borrow Activities

Alternative 1 Phase 2 - Unfavorable		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***1384.0***	***1384.0***	***0.0***	***1384.0***	***1384.0***	***1384.0***	***1384.0***	***1384.0***	***1384.0***	***1384.0***	***0.0***	***0.0***	***0.0***
A	A-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	1384.0	1384.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B	B-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1384.0	1384.0	1384.0	1384.0	1384.0	1384.0	1384.0	0.0	0.0	0.0
Alternative 2 Phase 2 - Unfavorable		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***1384.0***	***1384.0***	***1384.0***	***1384.0***	***2784.0***
A	A-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1400.0
B	B-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1384.0	1384.0	1384.0	1384.0	1384.0
Alternative 3 Phase 2 - Unfavorable		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***1384.0***	***1384.0***	***1384.0***	***1384.0***	***2768.0***	***1384.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
A	A-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1384.0	1384.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B	B-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	1384.0	1384.0	1384.0	1384.0	1384.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternative 4 Phase 2 - Unfavorable		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***1384.0***	***1384.0***	***1384.0***	***1384.0***	***1384.0***	***2784.0***
A	A-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1400.0
B	B-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1384.0	1384.0	1384.0	1384.0	1384.0	1384.0

ow Trips)

Alternative/Segment/Construction Phase	9/7/2014 - 9/13/2014	9/14/2014 - 9/20/2014	9/21/2014 - 9/27/2014	9/28/2014 - 10/4/2014	10/5/2014 - 10/11/2014	10/12/2014 - 10/18/2014	10/19/2014 - 10/25/2014	10/26/2014 - 11/1/2014	11/2/2014 - 11/8/2014	11/9/2014 - 11/15/2014	11/16/2014 - 11/22/2014	Max Trips	Average Trips	Duration (weeks)	PCE Trips	Haul Trucks	Workers	
																2	2	Trips / truck and worker
																1	1	PCE per vehicle
Alternative 1 Phase 2 - Unfavorable	***66.0***	***66.0***	***66.0***	***66.0***	***66.0***	***0.0***	***0.0***	***0.0***	***0.0***			***826***	***201***	***24***				
A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			436	102	12				
B	26.0	26.0	26.0	26.0	26.0	0.0	0.0	0.0	0.0			406	111	24				
Additional Workforce	40	40	40	40	40	0	0	0	0						40		20	
Electricity	0	0	0	0	0	0	0	0	0									
Alternative 2 Phase 2 - Unfavorable	***130.0***	***370.0***	***124.0***	***124.0***	***350.0***	***66.0***	***66.0***	***66.0***	***66.0***			***752***	***390***	***28***				
A	40.0	280.0	34.0	34.0	0.0	0.0	0.0	0.0	0.0			356	233	23				
B	50.0	50.0	50.0	50.0	310.0	26.0	26.0	26.0	26.0			356	159	28				
A-B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0									
Additional Workforce	40	40	40	40	40	40	40	40	40						40		20	
Electricity	0	0	0	0	0	0	0	0	0									
Alternative 3 Phase 2 - Unfavorable	***92.0***	***92.0***	***92.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***			***768***	***305***	***22***				
A	26.0	26.0	26.0	0.0	0.0	0.0	0.0	0.0	0.0			628	183	22				
B	26.0	26.0	26.0	0.0	0.0	0.0	0.0	0.0	0.0			466	82	22				
Additional Workforce	40	40	40	0	0	0	0	0	0						40		20	
Electricity	0	0	0	0	0	0	0	0	0									
Alternative 4 Phase 2 - Unfavorable	***130.0***	***370.0***	***124.0***	***124.0***	***320.0***	***66.0***	***66.0***	***66.0***	***66.0***	***66.0***	***66.0***	***752***	***366***	***30***				
A	40.0	280.0	34.0	34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	356	218	23				
B	50.0	50.0	50.0	50.0	280.0	26.0	26.0	26.0	26.0	26.0	26.0	356	159	30				
A-B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
Additional Workforce	40	40	40	40	40	40	40	40	40	40	40				40		20	
Electricity	0	0	0	0	0	0	0	0	0	0	0							

2014 Daily Vehicle Trips on Local Stre

Alternative 1 Phase 2 - Unfavorable		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***1384***	***1384***	***9***			
A	A-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1384	1384	2	1384	672	20
B	B-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1384	1384	7	1384	672	20
Alternative 2 Phase 2 - Unfavorable		***2784.0***	***1384.0***	***1384.0***	***1384.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***2784***	***1695***	***9***			
A	A-Off-Site Material Borrow	1400.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1400	1400	2	1400	680	20
B	B-Off-Site Material Borrow	1384.0	1384.0	1384.0	1384.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1384	1384	9	1384	672	20
Alternative 3 Phase 2 - Unfavorable		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***2768***	***1615***	***6***			
A	A-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1384	1384	2	1384	672	20
B	B-Off-Site Material Borrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1384	1384	5	1384	672	20
Alternative 4 Phase 2 - Unfavorable		***2784.0***	***1384.0***	***1384.0***	***1384.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***2784***	***1664***	***10***			
A	A-Off-Site Material Borrow	1400.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1400	1400	2	1400	680	20
B	B-Off-Site Material Borrow	1384.0	1384.0	1384.0	1384.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1384	1384	10	1384	672	20

SOUTHPORT SACRAMENTO RIVER EIP SITE
HIGH EMISSIONS ESTIMATE SUMMARY - (Unfavorable Scenario)

CMA #1 PHASE 2 Project Site Related Activities

Segment	Sequence Order	Construction Phase	Equipment	Number of Equipment	9 Hrs. Work Days	Daily Truck Trips	Roundtrip Miles	Daily Earthwork Rate (Dust Emissions)	Projected Time Frame
A	1	Building Demo	Bulldozer	1	21				May 1 to May 21
			Front End Loader	1	21				
			Excavator	1	21				
			Haul Truck	1	1	8	20		
			Worker Commute	3	21	1	22		
			Dust Emission	1.1	1				
	1	Roadway Removal	Cold Planer	1	2				May 1 to May 2
			Scraper	2	2				
			Dump Truck	5	2	17	20		
			Bulldozer	1	2				
			Excavator	1	2				
			Worker Commute	5	2	1	22		
	5	Roadway Replace	Dump Truck	14	4	15	20		June 25 to June 30
			Vibratory Compactor	2	6				
			Asphalt Paver	1	2				
			Asphalt Compactor	1	6				
			Motor Grader	2	6				
			Bulldozer	2	6				
			Worker Commute	8	6	1	22		
	2	Stripping	Wheel Tractor Scraper	3	8			4.02 Ac per day	May 22 to June 1
			Bulldozer	1	11				
			Dump Truck	10	11	17	20		
			Excavator	1	11				
			Worker Commute	5	11	1	22		
			Dust Emission	4.0	11				
	-	Levee Degrade	Scraper	0	0				June 2 to June 8
			Bulldozer	0	0				
			Dump Truck	0	0				
			Excavator	0	0				
	3	SB Cutoff Wall Installation	Dump Truck	3	7	53	0.25		
			Bulldozer	1	7				
			Long Reach Excavator	1	7				
			Hydraulic Excavator	1	7				
			ugh Terrain/Telehandler Fork	1	7				
			Worker Commute	4	7	1	22		
	4	Soil Borrow Extraction/Levee Placement	Scraper	10	16			13,493 CY per day	June 9 to June 24
			Excavator	4	16				
			Dump Truck	84	16	0	0		
			Sheeps Foot Compactor	1	16				
			Bulldozer	2	16				
			Motor Grader	1	16				
			Water Truck	2	4				
			Worker Commute	20	16	1	22		
			Dust Emission	1.3	16				
	6	Rip Rap Installation	Crane	6	12				July 1 to July 12
			Bulldozer	3	12				
			Hydraulic Excavator	3	12				
			Towboat	1	12	1.5	180		
			Worker Commute	13	12	1	22		
B	1	Building Demo	Bulldozer	6	31				May 1 to May 31
			Front End Loader	6	31				
			Excavator	6	31				
			Haul Truck	1	6	13	20		
			Worker Commute	18	31	1	22		
			Dust Emission	1.9	6				
	1	Roadway Removal	Cold Planer	1	1				May 1
			Scraper	1	1				
			Dump Truck	2	1	17	20		
			Bulldozer	1	1				
			Excavator	1	1				
			Worker Commute	4	1	1	22		
	4	Roadway Replace	Dump Truck	13	3	15	20		August 18 to August 21
			Vibratory Compactor	2	4				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	4				
			Motor Grader	2	4				
			Bulldozer	2	4				
			Worker Commute	8	4	1	22		
	2	Stripping	Wheel Tractor Scraper	3	22			4.73 Ac per day	June 1 to June 28
			Bulldozer	1	28				
			Dump Truck	10	28	17	20		
			Excavator	1	28				
			Worker Commute	5	28	1	22		
			Dust Emission	4.7	28				

	-	Levee Degrade	Scraper	0	0				
			Bulldozer	0	0				
			Dump Truck	0	0				
			Excavator	0	0				
	3	Soil Borrow Extraction/Levee Placement	Scraper	10	50			14,647 CY per day	June 29 to August 17
			Excavator	4	50				
			Dump Truck	84	50	0	0		
			Sheeps Foot Compactor	1	50				
			Bulldozer	2	50				
			Motor Grader	1	50				
			Water Truck	2	10				
			Worker Commute	20	50	1	22		
			Dust Emission	1.5	50				
	5	Rip Rap Installation	Crane	6	46				August 22 to October 6
			Bulldozer	3	46				
			Hydraulic Excavator	3	46				
			Towboat	1	46	1.5	180		
			Worker Commute	13	46	1	22		
			Worker Commute	**20**	**158**	**1**	**22**		

CMA #1 PHASE 2 Off-Site Material Borrow Activities

Segment	Sequence Order	Construction Phase	Equipment	Number of Equipment	9 Hrs. Work Days	Daily Truck Trips	Roundtrip Miles	Daily Earthwork Rate (Dust Emissions)	Projected Time Frame
A	1	Off-Site Material Borrow	Scraper	6	16			13,493 CY per day	June 9 to June 24
			Excavator	6	16				
			Dump Truck	84	16	8	6.6		
			Sheeps Foot Compactor	0	16				
			Bulldozer	6	16				
			Motor Grader	0	16				
			Water Truck	2	4				
			Worker Commute	20	16	1	22		
			Dust Emission	1.3	16				
B	2	Off-Site Material Borrow	Scraper	6	50			14,647 CY per day	June 29 to August 17
			Excavator	6	50				
			Dump Truck	84	50	8	6.6		
			Sheeps Foot Compactor	0	50				
			Bulldozer	6	50				
			Motor Grader	0	50				
			Water Truck	2	10				
			Worker Commute	20	50	1	22		
			Dust Emission	1.5	50				

SOUTHPORT SACRAMENTO RIVER EIP SITE
HIGH EMISSIONS ESTIMATE SUMMARY - (Unfavorable Scenario)
(Sequential Borrow Restoration)
CMA #2 PHASE 2 Project Site Related Activities

Segment	Sequence Order	Construction Phase	Equipment	Number of Equipment	9 Hrs. Work Days	Daily Truck Trips	Roundtrip Miles	Daily Earthwork Rate (Dust Emissions)	Projected Time Frame
A	1	Building Demo	Bulldozer	2	25				May 1 to May 25
			Front End Loader	2	25				
			Excavator	2	25				
			Haul Truck	1	4	13	20		
			Worker Commute	6	25	1	22		
			Dust Emission	1.9	4				
	1	Roadway Removal	Cold Planer	1	2				May 1 to May 2
			Scraper	2	2				
			Dump Truck	5	2	15	20		
			Bulldozer	1	2				
			Excavator	1	1				
			Worker Commute	5	2	1	22		
	6	Roadway Replace	Dump Truck	9	2	15	20		September 18 to September 20
			Vibratory Compactor	1	3				
			Asphalt Paver	1	2				
			Asphalt Compactor	1	3				
			Motor Grader	1	3				
			Bulldozer	1	3				
			Worker Commute	5	3	1	22		
	2	Stripping	Wheel Tractor Scraper	3	13			4.47 Ac per day	May 26 to June 11
			Bulldozer	1	17				
			Dump Truck	10	17	17	20		
			Excavator	1	17				
			Worker Commute	5	17	1	22		
			Dust Emission	4.5	17				
	3	Levee Degrade	Scraper	6	54			3,682 CY per day	June 12 to August 20
			Bulldozer	1	70				
			Dump Truck	10	70	17	20		
			Excavator	1	70				
			Worker Commute	8	70	1	22		
			Dust Emission	0.4	70				
	4	SB Cutoff Wall Installation	Dump Truck	3	9	53	0.25		August 21 to September 17
			Bulldozer	1	9				
			Long Reach Excavator	1	9				
			Hydraulic Excavator	1	9				
			ugh Terrain/Telehandler Fork	1	9				
			Worker Commute	4	9	1	22		
	5	Soil Borrow Extraction/Levee Placement	Scraper	10	19			14,024 CY per day	August 30 to September 17
			Excavator	4	19				
			Dump Truck	40	19	0	0		
			Sheeps Foot Compactor	1	19				
			Bulldozer	2	19				
			Motor Grader	1	19				
			Water Truck	2	4				
			Worker Commute	20	19	1	22		
			Dust Emission	1.4	19				
	7	Rip Rap Installation	Crane	8	9				September 21 to September 29
			Bulldozer	4	9				
			Hydraulic Excavator	4	9				
			Towboat	1	9	1.5	180		
			Worker Commute	17	9	1	22		
B	1	Building Demo	Bulldozer	3	23				May 1 to May 23
			Front End Loader	3	23				
			Excavator	3	23				
			Haul Truck	1	7	13	20		
			Worker Commute	9	23	1	22		
			Dust Emission	1.9	7				
	1	Roadway Removal	Cold Planer	1	1				May 1
			Scraper	2	1				
			Dump Truck	6	1	17	20		
			Bulldozer	1	1				
			Excavator	1	1				
			Worker Commute	5	1	1	22		
	5	Roadway Replace	Dump Truck	10	2	15	20		October 9 to October 10
			Vibratory Compactor	1	2				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	2				
			Motor Grader	1	2				
			Bulldozer	1	2				
			Worker Commute	5	2	1	22		
	2	Stripping	Wheel Tractor Scraper	3	24			4.74 Ac per day	May 24 to June 23
			Bulldozer	1	31				
			Dump Truck	10	31	17	20		
			Excavator	1	31				
			Worker Commute	5	31	1	22		
			Dust Emission	4.7	31				

	3	Levee Degrade	Scraper	6	31			3,873 CY per day	June 24 to August 1
			Bulldozer	1	39				
			Dump Truck	10	38	17	20		
			Excavator	1	39				
			Worker Commute	8	39	1	22		
			Dust Emission	0.4	39				
	5	SB Cutoff Wall Installation	Dump Truck	3	1	53	0.25		August 2 to August 2
			Bulldozer	1	1				
			Long Reach Excavator	1	1				
			Hydraulic Excavator	1	1				
			ugh Terrain/Telehandler Fork	1	1				
			Worker Commute	4	1	1	22		
	6	Soil Borrow Extraction/Levee Placement	Scraper	10	67			14,956 CY per day	August 3 to October 8
			Excavator	9	67				
			Dump Truck	48	67	0	0		
			Sheeps Foot Compactor	1	67				
			Bulldozer	2	67				
			Motor Grader	1	67				
			Water Truck	2	14				
			Worker Commute	25	67	1	22		
			Dust Emission	1.5	67				
	7	Rip Rap Installation	Crane	6	30				October 9 to November 7
			Bulldozer	3	30				
			Hydraulic Excavator	3	30				
			Towboat	1	30	1.5	180		
			Worker Commute	13	30	1	22		
			Worker Commute	**20**	**190**	**1**	**22**		

CMA #2 PHASE 2 Off-Site Material Borrow Activities									
Segment	**Sequence Order**	**Construction Phase**	**Equipment**	**Number of Equipment**	**9 Hrs. Work Days**	**Daily Truck Trips**	**Roundtrip Miles**	**Daily Earthwork Rate (Dust Emissions)**	**Projected Time Frame**
A	2	Off-Site Material Borrow	Scraper	6	19			14,024 CY per day	August 30 to September 17
			Excavator	6	19				
			Dump Truck	40	19	17	6.6		
			Sheeps Foot Compactor	0	19				
			Bulldozer	6	19				
			Motor Grader	0	19				
			Water Truck	2	4				
			Worker Commute	20	19	1	22		
			Dust Emission	1.4	19				
B	1	Off-Site Material Borrow	Scraper	6	67			14,956 CY per day	August 3 to October 8
			Excavator	6	67				
			Dump Truck	48	67	14	6.6		
			Sheeps Foot Compactor	0	67				
			Bulldozer	6	67				
			Motor Grader	0	67				
			Water Truck	2	14				
			Worker Commute	20	67	1	22		
			Dust Emission	1.5	67				

SOUTHPORT SACRAMENTO RIVER EIP SITE
HIGH EMISSIONS ESTIMATE SUMMARY - (Unfavorable Scenario)

CMA #3 PHASE 2 Project Site Related Activities

Segment	Sequence Order	Construction Phase	Equipment	Number of Equipment	9 Hrs. Work Days	Daily Truck Trips	Roundtrip Miles	Daily Earthwork Rate (Dust Emissions)	Projected Time Frame
A	1	Roadway Removal	Cold Planer	1	2				May 1 to May 2
			Scraper	2	2				
			Dump Truck	5	2	17	20		
			Bulldozer	1	2				
			Excavator	1	2				
			Worker Commute	5	2	1	22		
	6	Roadway Replace	Dump Truck	18	3	17	20		July 23 to July 26
			Vibratory Compactor	2	4				
			Asphalt Paver	1	2				
			Asphalt Compactor	1	4				
			Motor Grader	2	4				
			Bulldozer	2	4				
			Worker Commute	8	4	1	22		
	2	Stripping	Wheel Tractor Scraper	3	9			4.17 Ac per day	May 3 to May 14
			Bulldozer	1	12				
			Dump Truck	10	12	17	20		
			Excavator	1	12				
			Worker Commute	5	12	1	22		
			Dust Emission	4.2	12				
	3	Levee Degrade	Scraper	17	12			3,667 CY per day	May 15 to June 26
			Bulldozer	1	43				
			Dump Truck	10	43	17	20		
			Excavator	1	43				
			Worker Commute	19	43	1	22		
			Dust Emission	0.4	43				
	4	SB Cutoff Wall Installation	Dump Truck	3	7	53	0.25		June 27 to July 3
			Bulldozer	1	7				
			Long Reach Excavator	1	7				
			Hydraulic Excavator	1	7				
			gh Terrain/Telehandler Fo	1	7				
			Worker Commute	4	7	1	22		
	5	Soil Borrow Extraction/Levee Placement	Scraper	10	19			14,024 CY per day	July 4 to July 22
			Excavator	4	19				
			Dump Truck	84	19	0	0		
			Sheeps Foot Compactor	1	19				
			Bulldozer	2	19				
			Motor Grader	1	19				
			Water Truck	2	4				
			Worker Commute	20	19	1	22		
			Dust Emission	1.4	19				
	7	Rip Rap Installation	Crane	6	59				July 27 to September 23
			Bulldozer	3	59				
			Hydraulic Excavator	3	59				
			Towboat	1	59	1.5	180		
			Worker Commute	13	59	1	22		
B	1	Building Demo	Bulldozer	6	31				May 1 to May 31
			Front End Loader	6	31				
			Excavator	6	31				
			Haul Truck	1	6	13	20		
			Worker Commute	18	31	1	22		
			Dust Emission	1.9	6				
	1	Roadway Removal	Cold Planer	1	1				May 1
			Scraper	2	1				
			Dump Truck	6	1	17	20		
			Bulldozer	1	1				
			Excavator	1	1				
			Worker Commute	5	1	1	22		
	4	Roadway Replace	Dump Truck	15	3	15	20		July 13 to July 17
			Vibratory Compactor	2	5				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	5				
			Motor Grader	2	5				
			Bulldozer	2	5				
			Worker Commute	8	5	1	22		
	2	Stripping	Wheel Tractor Scraper	3	6			4.43 Ac per day	June 1 to June 7
			Bulldozer	1	7				
			Dump Truck	10	7	17	20		
			Excavator	1	7				
			Worker Commute	5	7	1	22		
			Dust Emission	4.4	7				
	-	Levee Degrade	Scraper	0	0				
			Bulldozer	0	0				
			Dump Truck	0	0				
			Excavator	0	0				

	3	Soil Borrow Extraction/Levee Placement	Scraper	10	35			14,487 CY per day	June 8 to July 12
			Excavator	4	35				
			Dump Truck	84	35	0	0		
			Sheeps Foot Compactor	1	35				
			Bulldozer	2	35				
			Motor Grader	1	35				
			Water Truck	2	7				
			Worker Commute	20	35	1	22		
			Dust Emission	1.4	35				
	5	Rip Rap Installation	Crane	6	68				July 18 to September 23
			Bulldozer	3	68				
			Hydraulic Excavator	3	68				
			Towboat	1	68	1.5	180		
			Worker Commute	13	68	1	22		
			Worker Commute	**20**	**145**	**1**	**22**		

CMA #3 PHASE 2 Off-Site Material Borrow Activities

Segment	Sequence Order	Construction Phase	Equipment	Number of Equipment	9 Hrs. Work Days	Daily Truck Trips	Roundtrip Miles	Daily Earthwork Rate (Dust Emissions)	Projected Time Frame
A	1	Off-Site Material Borrow	Scraper	6	19			14,024 CY per day	July 4 to July 22
			Excavator	6	19				
			Dump Truck	84	19	8	20		
			Sheeps Foot Compactor	0	19				
			Bulldozer	6	19				
			Motor Grader	0	19				
			Water Truck	2	4				
			Worker Commute	20	19	1	22		
			Dust Emission	1.4	19				
B	2	Off-Site Material Borrow	Scraper	6	35			14,487 CY per day	June 8 to July 12
			Excavator	6	35				
			Dump Truck	84	35	8	20		
			Sheeps Foot Compactor	0	35				
			Bulldozer	6	35				
			Motor Grader	0	35				
			Water Truck	2	7				
			Worker Commute	20	35	1	22		
			Dust Emission	1.4	35				

SOUTHPORT SACRAMENTO RIVER EIP SITE
HIGH EMISSIONS ESTIMATE SUMMARY - (Unfavorable Scenario)
(Sequential Borrow Restoration)
CMA #4 PHASE 2 Project Site Related Activities

Segment	Sequence Order	Construction Phase	Equipment	Number of Equipment	9 Hrs. Work Days	Daily Truck Trips	Roundtrip Miles	Daily Earthwork Rate (Dust Emissions)	Projected Time Frame
A	1	Building Demo	Bulldozer	2	25				May 1 to May 25
			Front End Loader	2	25				
			Excavator	2	25				
			Haul Truck	1	4	13	20		
			Worker Commute	6	25	1	22		
			Dust Emission	1.9	4				
	1	Roadway Removal	Cold Planer	1	2				May 1 to May 2
			Scraper	2	2				
			Dump Truck	5	2	15	20		
			Bulldozer	1	2				
			Excavator	1	1				
			Worker Commute	5	2	1	22		
	6	Roadway Replace	Dump Truck	9	2	15	20		September 17 to September 19
			Vibratory Compactor	1	3				
			Asphalt Paver	1	2				
			Asphalt Compactor	1	3				
			Motor Grader	1	3				
			Bulldozer	1	3				
			Worker Commute	5	3	1	22		
	2	Stripping	Wheel Tractor Scraper	3	13			4.47 Ac per day	May 26 to June 11
			Bulldozer	1	17				
			Dump Truck	10	17	17	20		
			Excavator	1	17				
			Worker Commute	5	17	1	22		
			Dust Emission	4.5	17				
	3	Levee Degrade	Scraper	6	54			3,736 CY per day	June 12 to August 19
			Bulldozer	1	69				
			Dump Truck	10	69	17	20		
			Excavator	1	69				
			Worker Commute	8	69	1	22		
			Dust Emission	0.4	69				
	4	SB Cutoff Wall Installation	Dump Truck	3	9	53	0.25		August 20 to August 28
			Bulldozer	1	9				
			Long Reach Excavator	1	9				
			Hydraulic Excavator	1	9				
			gh Terrain/Telehandler For	1	9				
			Worker Commute	4	9	1	22		
	5	Soil Borrow Extraction/Levee Placement	Scraper	10	19			14,024 CY per day	August 29 to September 16
			Excavator	4	19				
			Dump Truck	40	19	0	0		
			Sheeps Foot Compactor	1	19				
			Bulldozer	2	19				
			Motor Grader	1	19				
			Water Truck	2	4				
			Worker Commute	20	19	1	22		
			Dust Emission	1.4	19				
	7	Rip Rap Installation	Crane	8	9				September 20 to September 28
			Bulldozer	4	9				
			Hydraulic Excavator	4	9				
			Towboat	1	9	1.5	180		
			Worker Commute	17	9	1	22		
B	1	Building Demo	Bulldozer	3	23				May 1 to May 23
			Front End Loader	3	23				
			Excavator	3	23				
			Haul Truck	1	7	13	20		
			Worker Commute	9	23	1	22		
			Dust Emission	1.9	7				
	1	Roadway Removal	Cold Planer	1	1				May 1
			Scraper	2	1				
			Dump Truck	6	1	17	20		
			Bulldozer	1	1				
			Excavator	1	1				
			Worker Commute	5	1	1	22		
	6	Roadway Replace	Dump Truck	10	2	15	20		October 8 to October 9
			Vibratory Compactor	1	2				
			Asphalt Paver	1	1				
			Asphalt Compactor	1	2				
			Motor Grader	1	2				
			Bulldozer	1	2				
			Worker Commute	5	2	1	22		
	2	Stripping	Wheel Tractor Scraper	3	24			4.74 Ac per day	May 24 to June 23
			Bulldozer	1	31				
			Dump Truck	10	31	17	20		
			Excavator	1	31				
			Worker Commute	5	31	1	22		
			Dust Emission	4.7	31				

	3	Levee Degrade	Scraper	6	31			3,873 CY per day	June 24 to August 1
			Bulldozer	1	39				
			Dump Truck	10	38	17	20		
			Excavator	1	39				
			Worker Commute	8	39	1	22		
			Dust Emission	0.4	39				
	4	SB Cutoff Wall Installation	Dump Truck	3	1	53	0.25		August 2 to August 2
			Bulldozer	1	1				
			Long Reach Excavator	1	1				
			Hydraulic Excavator	1	1				
			gh Terrain/Telehandler For	1	1				
			Worker Commute	4	1	1	22		
	5	Soil Borrow Extraction/Levee Placement	Scraper	10	67			14,956 CY per day	August 2 to October 7
			Excavator	9	67				
			Dump Truck	48	67	0	0		
			Sheeps Foot Compactor	1	67				
			Bulldozer	2	67				
			Motor Grader	1	67				
			Water Truck	2	14				
			Worker Commute	25	67	1	22		
			Dust Emission	1.5	67				
	7	Rip Rap Installation	Crane	6	40				October 10 to November 18
			Bulldozer	3	40				
			Hydraulic Excavator	3	40				
			Towboat	1	40	1.5	180		
			Worker Commute	13	40	1	22		
			Worker Commute	**20**	**201**	**1**	**22**		

CMA #4 PHASE 2 Off-Site Material Borrow Activities

Segment	Sequence Order	Construction Phase	Equipment	Number of Equipment	9 Hrs. Work Days	Daily Truck Trips	Roundtrip Miles	Daily Earthwork Rate (Dust Emissions)	Projected Time Frame
A	2	Off-Site Material Borrow	Scraper	6	19			14,024 CY per day	August 29 to September 16
			Excavator	6	19				
			Dump Truck	40	19	17	6.6		
			Sheeps Foot Compactor	0	19				
			Bulldozer	6	19				
			Motor Grader	0	19				
			Water Truck	2	4				
			Worker Commute	20	19	1	22		
			Dust Emission	1.4	19				
B	1	Off-Site Material Borrow	Scraper	6	67			14,956 CY per day	August 2 to October 7
			Excavator	6	67				
			Dump Truck	48	67	14	6.6		
			Sheeps Foot Compactor	0	67				
			Bulldozer	6	67				
			Motor Grader	0	67				
			Water Truck	2	14				
			Worker Commute	20	67	1	22		
			Dust Emission	1.5	67				

Appendix E

Air Quality and Climate Change Technical Appendix

Appendix E.1

General Conformity Determination

Appendix E.1

General Conformity Determination

E.1.1 Introduction

This appendix provides the general conformity determination for the applicant-preferred alternative (APA) of the Southport Early Implementation Project (SEIP, or project). A general conformity determination is required by Section 176 of the Clean Air Act (CAA). The CAA requires states to submit a state implementation plan (SIP) for areas in nonattainment for Federal standards. Section 176(c)(1) of the CAA prohibits Federal agencies from engaging in, supporting, or providing financial assistance for licensing, permitting, or approving any activities that do not conform to an approved SIP.

The U.S. Environmental Protection Agency (EPA) enacted the Federal general conformity regulation in 1993 (40 Code of Federal Regulations [CFR] Parts 5, 51, and 93). The purpose of the general conformity rule is to ensure that Federal actions do not generate emissions that interfere with state and local agencies' SIPs and emission-reduction strategies to ensure attainment of the national ambient air quality standards (NAAQS). Specifically, projects that receive Federal funding or require Federal approval must demonstrate that they would not cause or contribute to new violations of air quality standards, exacerbate existing violations, or interfere with timely attainment or required interim emissions reductions toward attainment. Because the project is receiving Federal funds and approvals from the U.S. Army Corps of Engineers (USACE), all direct and indirect emissions generated by the project are subject to the general conformity rule.

E.1.1.1 Regulatory Status of the Study Area

The study area is subject to air quality regulations developed and implemented at the Federal, state, and local levels. At the Federal level, the EPA is responsible for implementation of the CAA. Some portions of the CAA (e.g., certain mobile-source and other requirements) are implemented directly by EPA. Other portions of the CAA (e.g., stationary-source requirements) are implemented by state and local agencies.

Responsibility for attaining and maintaining air quality in California is divided between the California Air Resources Board (ARB) and regional air quality districts. The Yolo-Solano Air Quality Management District (YSAQMD), Sacramento Metropolitan Air Quality Management District (SMAQMD), and Bay Area Air Quality Management District (BAAQMD) have jurisdiction over local air quality within the study area. Although the project is located in the Yolo County under the jurisdiction of YSAQMD, the construction activities would generate indirect air pollutant emissions from activities located in SMAQMD and BAAQMD.

Under the CAA, YSAQMD, SMAQMD, and BAAQMD are required to develop air quality plans for nonattainment criteria pollutants in their respective air districts. The 1994 Sacramento Area Regional Ozone Attainment Plan was prepared to address VOC and NO_X emissions following the region's serious nonattainment designation for the 1-hour ozone NAAQS in November 1991. The Sacramento Regional 8-Hour Attainment and Reasonable Further Progress Plan has also been adopted to address the region's nonattainment status for the 8-hour ozone NAAQS. Air districts

within the Sacramento Federal Nonattainment Area (SFNA) have submitted the ozone plan to the EPA and are currently waiting for the agency to approve the document. Counties in the SFNA (Sacramento, Yolo, Placer, El Dorado, Solano, Sutter, and Butte) have also adopted the Northern Sacramento Valley Planning Area 2009 Triennial Air Quality Attainment Plan (2009 Plan) (Sacramento Valley Air Quality Engineering and Enforcement Professionals 2010). This plan outlines strategies to achieve the health-based ozone standard. The Sacramento region is also in the process of developing a plan to address particulate matter (PM).

E.1.1.2 General Conformity Requirements

The general conformity rule applies to all Federal actions located in nonattainment and maintenance areas that are not exempt from general conformity (are either covered by Transportation Conformity or listed in the rule), are not covered by a presumed-to-conform approved list[1], or do not have clearly *de minimis* emissions. In addition, the general conformity rule applies only to direct and indirect emissions associated with the portions of any Federal action that are subject to New Source Review (i.e., do not include stationary industrial sources requiring air quality permits from local air pollution control agencies) for which a Federal permitting agency has directly caused or initiated, has continued program responsibility for, or can practically control.

Federal projects must undertake an evaluation to determine whether all project emission sources are subject to the general conformity rule. The analysis includes a stepwise process in which the Federal agency determines the following.

1. **Is the project located in a Federal attainment area?** If yes, the project is not subject to general conformity and no future analysis is required. If no, document whether the project is located in a nonattainment or maintenance area and proceed to step 2.
2. **Does one or more of the specific exemptions apply to the project?** If yes, the project is exempt from general conformity and no further analysis is required. If no, proceed to step 3.
3. **Has the Federal agency included the action on its list of presumed-to-conform actions?** If yes, the project is presumed to conform to the applicable SIP and the requirements of general conformity are satisfied. If no, proceed to step 4.
4. **Are the total direct and indirect emissions below the *de minis* thresholds?** If yes, the project would not cause or contribute to new violations of air quality standards; the requirements of general conformity are satisfied. If no, the applicant must perform a conformity determination.

A general conformity determination is made by satisfying any of the following requirements.

- Showing that the emission increases caused by the Federal action are included in the SIP.
- Demonstrating that the state agrees to include the emission increases in the SIP.
- Offsetting the action's emissions in the same or nearby area.
- Mitigating to reduce the emission increase.
- Utilizing a combination of the above strategies.

[1] Category of activities designated by a Federal agency as having emissions below *de minimis* levels or otherwise do not interfere with the applicable SIP or the attainment and maintenance of the NAAQS.

The general conformity rule states that the applicability analysis can be (but is not required to be) completed concurrently with any analysis required under the National Environmental Policy Act (NEPA). The applicability analysis for the proposed project is described in Section E.1.8, *Applicability Analysis*.

E.1.2 Description of the Federal Action

The Federal lead agency is only required to conduct a general conformity evaluation for the specific Federal action associated with the selected alternative for a project or program (U.S. Environmental Project Agency 1994). The positive conformity determination must be submitted before the Federal action is approved. Each Federal agency is responsible for determining conformity of those proposed actions over which it has jurisdiction. Alternative 5 has been selected as the applicant-preferred alternative (APA). The general conformity determination presented in this appendix therefore relates only to those activities included in the USACE's action pertaining to Alternative 5. If the APA is modified such that it would generate higher amount of emissions than Alternative 5, the general conformity determination would be revised to reflect the changes before the finalization of the EIR/EIS. The project is described further in Section E.1.3 below.

E.1.3 Southport Early Implementation Project

The primary purpose of the SEIP is to project to implement flood risk–reduction measures along the Sacramento River South Levee in the city of West Sacramento, Yolo County. The project is targeted at providing 200-year protection consistent with the state goal for urbanized areas, as well as providing opportunities for ecosystem restoration and public recreation. The project reach extends along the right bank of the Sacramento River, bounded on the north by the USACE Sacramento River Bank Protection Project (SRBPP) site (south of the Barge Canal) and continuing downstream approximately 5.6 miles to the South Cross Levee, adjacent to the Southport community of West Sacramento.

Alternative 5 involves the construction of setback levees in Segments B–F and the breach and degrading of the existing levee to restore the historical Sacramento River floodplain (Plates 2-6a and 2-6b of the EIS/EIR). Project elements would include slope flattening with rock slope protection in Segment A instead of an adjacent levee with rock slope protection, and would maintain the hydraulic isolation of the Bees Lakes area in Segment E from the Sacramento River through construction of a levee ring. Table 2-10 in Chapter 2, *Alternatives*, provides detail for the treatments proposed for each segment under Alternative 5.

E.1.4 Air Quality Conditions in the Study Area

The project area is in Yolo County, which are located in the Sacramento Valley Air Basin (SVAB). The SVAB is bounded on the north by the Cascade Range, on the south by the San Joaquin Valley Air Basin, on the east by the Sierra Nevada, and on the west by the Coast Ranges.

E.1.4.1 Climate and Meteorology

The SVAB has a Mediterranean climate characterized by hot, dry summers and cool, rainy winters. During winter, the North Pacific storm track intermittently dominates Sacramento Valley weather, and fair weather alternates with periods of extensive clouds and precipitation. Periods of dense and persistent low-level fog, which are most prevalent between storms, are also characteristic of winter weather in the valley. The frequency and persistence of heavy fog in the valley diminish with the approach of spring. The average yearly temperature range for the Sacramento Valley is 20 degrees Fahrenheit (°F) to 115°F, with summer high temperatures often exceeding 90°F and winter low temperatures occasionally dropping below freezing.

In general, the prevailing winds are moderate in strength and vary from moist clean breezes from the south to dry land flows from the north. The mountains surrounding the SVAB create a barrier to airflow, which can trap air pollutants under certain meteorological conditions. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells collect over the Sacramento Valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduce the influx of outside air and allow air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with temperature inversions that trap pollutants near the ground.

The ozone season (May through October) in the Sacramento Valley is characterized by stagnant morning air or light winds with the Delta sea breeze arriving in the afternoon out of the southwest. Usually the evening breeze transports the airborne pollutants to the north out of the Sacramento Valley. During about half of the days from July to September, however, a phenomenon called the *Schultz Eddy* prevents this from occurring. Instead of allowing the prevailing wind patterns to move north carrying the pollutants out, the Schultz Eddy causes the wind pattern to circle back to the south. Essentially, this phenomenon causes the air pollutants to be blown south toward the Sacramento Valley and Yolo County. This phenomenon has the effect of exacerbating the pollution levels in the area and increases the likelihood of violating Federal or state standards. The eddy normally dissipates around noon when the Delta sea breeze arrives (Yolo-Solano Air Quality Management District 2007).

E.1.4.2 Ambient Air Quality

The existing air quality conditions in the project area can also be characterized by monitoring data collected in the region. Although the project is located in Yolo County, the nearest monitoring stations in both Yolo County and Sacramento County are selected to present air quality of the project vicinity. Air quality concentrations typically are expressed in terms of parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The nearest monitoring stations to the project area are the West Sacramento 15th Street station, which monitors PM10; the Sacramento T Street station, which monitors ozone and PM2.5; and the Sacramento Del Paso Manor station, which monitors carbon monoxide (CO).

Table E.1-1 summarizes air quality monitoring data from the monitoring stations for the last 3 years, 2009–2011, for which complete data are available (as of the time of publication, complete 2012 monitoring data are not available). As shown in Table E.1-1, the monitoring stations have experienced occasional violations of the NAAQS and California Ambient Air Quality Standards

(CAAQS) for all pollutants except CO. However, in general, air quality is improving in the region, as indicated by the declining number of measured violations.

Table E.1-1. Ambient Air Quality Monitoring Data (2009–2011)

Pollutant Standards	2009	2010	2011
1-Hour Ozone (ppm) (Sacramento T Street)			
Maximum 1-hour concentration	0.102	0.092	0.100
1-hour California designation value	0.102	0.101	0.095
1-hour expected peak day concentration	0.103	0.103	0.092
Number of days standard exceeded[a]			
CAAQS 1-hour (>0.09 ppm)	3	0	1
8-Hour Ozone (ppm) (Sacramento T Street)			
National maximum 8-hour concentration	0.088	0.074	0.087
National second-highest 8-hour concentration	0.080	0.069	0.072
State maximum 8-hour concentration	0.089	0.074	0.087
State second-highest 8-hour concentration	0.080	0.070	0.073
8-hour national designation value	0.077	0.075	0.071
8-hour California designation value	0.092	0.089	0.080
8-hour expected peak day concentration	0.092	0.090	0.084
Number of days standard exceeded[a]			
NAAQS 8-hour (>0.075 ppm)	4	0	1
CAAQS 8-hour (>0.070 ppm)	13	1	5
CO (ppm) (Sacramento Del Paso)			
National[b] maximum 8-hour concentration	2.77	1.60	2.27
National[b] second-highest 8-hour concentration	2.19	1.45	2.23
California[c] maximum 8-hour concentration	2.77	1.60	2.27
California[c] second-highest 8-hour concentration	2.19	1.45	2.23
Maximum 1-hour concentration	3.1	1.9	2.6
Second-highest 1-hour concentration	3.0	1.9	2.5
Number of days standard exceeded[a]			
NAAQS 8-hour (≥9 ppm)	0	0	0
CAAQS 8-hour (≥9.0 ppm)	0	0	0
NAAQS 1-hour (≥35 ppm)	0	0	0
CAAQS 1-hour (≥20 ppm)	0	0	0
PM10[d] (μg/m^3) (West Sacramento 15th Street)			
National[b] maximum 24-hour concentration	55.8	58.0	67.8
National[b] second-highest 24-hour concentration	49.7	48.0	52.4
State[c] maximum 24-hour concentration	59.4	58.0	72.1
State[c] second-highest 24-hour concentration	52.5	47.0	57.2
State annual average concentration[e]	21.2	18.3	20.7
National annual average concentration	20.3	17.9	20.0

Pollutant Standards	2009	2010	2011
Number of days standard exceeded[a]			
NAAQS 24-hour (>150 μg/m³)[f]	0	0	0
CAAQS 24-hour (>50 μg/m³)[f]	2	1	2
PM2.5 (μg/m³) (Sacramento **T Street)**			
National[b] maximum 24-hour concentration	37.7	30.6	50.5
National[b] second-highest 24-hour concentration	27.3	27.6	47.8
State[c] maximum 24-hour concentration	50.1	37.0	50.5
State[c] second-highest 24-hour concentration	48.1	35.1	47.8
National annual designation value	10.8	9.5	9.2
National annual average concentration	9.5	8.0	10.1
State annual designation value	10	10	10
State annual average concentration[e]	9.5	8.1	10.1
Number of days standard exceeded[a]			
NAAQS 24-hour (>35 μg/m³)[f]	1	0	6

Sources: California Air Resources Board 2012; U.S. Environmental Protection Agency 2012.
– = insufficient data available to determine the value.
[a] An exceedance is not necessarily a violation.
[b] National statistics are based on standard conditions data. In addition, national statistics are based on samplers using Federal reference or equivalent methods.
[c] State statistics are based on local conditions data, except in the South Coast Air Basin, for which statistics are based on standard conditions data. In addition, State statistics are based on California approved samplers.
[d] Measurements usually are collected every 6 days.
[e] State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.
[f] Mathematical estimate of how many days concentrations would have been measured as higher than the level of the standard had each day been monitored. Values have been rounded.

E.1.4.3 Mass Emissions

The ARB compiles an emissions inventory for all sources of emissions within the study area. This inventory is used by the YSAQMD, SMAQMD, BAAQMD, and ARB for regional air quality planning purposes and is the basis for the region's air quality plans, and includes such sources as stationary (e.g., landfills, electric utilities, mineral processes); area-wide (e.g., farming operations, construction/demolition activities, residential fuel combustion); and mobile sources (e.g., automobiles, aircraft, off-road equipment). Current emissions of criteria pollutants for 2008 (the most recent year for which inventory data are available) for Yolo and Sacramento Counties are summarized in Tables E.1-2 and E.1-3, respectively.

Table E.1-2. Yolo County Air Quality Emissions—2008

	Annual emissions (tons per day)					
Source type	**ROG**	**CO**	**NO_X**	**SO_X**	**PM10**	**PM2.5**
Stationary sources						
Total fuel combustion	0.24	2.37	3.48	0.25	0.54	0.53
Total waste disposal	0.1	0.05	0.01	0.07	0.01	0
Total cleaning and surface coatings	0.96	0.02	0.02	0	0.02	0.02
Total petroleum production and marketing	1.23	0.2	0.04	–	–	–
Total industrial processes	0.54	0.48	0.17	0.08	3.21	1.6
Total stationary sources	3.07	3.12	3.73	0.4	3.78	2.15
Area-wide sources						
Total solvent evaporation	2.58	–	–	–	–	–
Total miscellaneous processes	0.86	6.9	0.52	0.04	51.06	24.94
Total area-wide sources	3.44	6.9	0.52	0.04	51.06	24.94
Mobile sources						
Total on road mobile sources	3.7	36.14	10.8	0.03	0.48	0.48
Total off road mobile sources	2.66	16.28	8.14	0.09	0.46	0.45
Total mobile sources	6.36	52.42	18.93	0.12	0.94	0.93
Yolo County total	12.87	62.44	23.18	0.57	55.78	28.01

Table E.1-3. Sacramento County Air Quality Emissions—2008

	Annual emissions (tons per day)					
Source type	**ROG**	**CO**	**NO_X**	**SO_X**	**PM10**	**PM2.5**
Stationary sources						
Total fuel combustion	0.35	3.73	3.62	0.07	0.42	0.42
Total waste disposal	0.34	0.05	0.05	0	0.01	0.01
Total cleaning and surface coatings	3.99	–	–	–	–	–
Total petroleum production and marketing	2.49	0.01	0	–	–	–
Total industrial processes	0.91	0.27	0.23	0.07	2.27	1.07
Total stationary sources	8.07	4.06	3.9	0.14	2.71	1.5
Area-wide sources						
Total solvent evaporation	13.23	–	–	–	0.01	0.01
Total miscellaneous processes	4.04	40.26	3.1	0.12	74.4	39.37
Total area-wide sources	17.27	40.26	3.1	0.12	74.41	39.38
Mobile sources						
Total on road mobile sources	22.69	209.32	44.06	0.18	2.07	2.04
Total off road mobile sources	12.94	86.01	24.91	0.19	1.54	1.51
Total mobile sources	35.63	295.33	68.98	0.37	3.61	3.55
Sacramento County total	60.97	339.65	75.97	0.63	80.73	44.43

E.1.4.4 Federal Nonattainment Status and Conformity Applicably

Local monitoring data (Table E.1-1) are used to designate areas as nonattainment, maintenance, attainment, or unclassified for the NAAQS. Table E.1-4 summarizes the attainment status of the project area within YSAQMD, SMAQMD, and BAAQMD with regard to the NAAQS.

Table E.1-4. Federal Attainment Status of the Project Area within Butte and Sutter Counties

Pollutant	YSAQMD NAAQS	SMAQMD NAAQS	BAAQMD NAAQS
1-hour Ozone	–	–	–
8-hour Ozone	Severe Nonattainment	Severe Nonattainment	Marginal Nonattainment
CO	Moderate Maintenance	Moderate Maintenance	Moderate Maintenance
PM10	Unclassified	Moderate Nonattainment	Unclassified
PM2.5	Nonattainment	Nonattainment	Nonattainment

Sources: California Air Resources Board 2011a; U.S. Environmental Protection Agency 2011.
– = No applicable standard.
BAAQMD = Bay Area Air Quality Management District.
CO = carbon monoxide.
NAAQS = national ambient air quality standards.
PM10 = particulate matter 10 microns in diameter or less.
PM2.5 = particulate matter 2.5 microns in diameter or less.
SMAQMD = Sacramento Metropolitan Air Quality Management District.
YSAQMD = Yolo-Solano Air Quality Management District.

The general conformity evaluation is made by comparing all emission sources (e.g., haul trucks, off-road equipment) to the applicable general conformity *de minimis* thresholds based on the regional nonattainment status. Table E.1-5 summarizes the *de minimis* thresholds applicable to project activities. YSAQMD and SMAQMD are located in the SVAB and BAAQMD is located in the San Francisco Bay Area Air Basin (SFBAAB).

Table E.1-5. Federal General Conformity *de Minimis* Thresholds

	Annual Air Pollutant Emissions in Tons per Year				
Air Basin	**ROG**	**NO_X**	**CO**	**PM10**	**PM2.5**
Sacramento Valley Air Basin (include YSAQMD and SMAQMD)	25	25	100	100	100
Bay Area Air Basin (include BAAQMD)	50	100	100	None	100

Source: 40 CFR 93.153
BAAQMD = Bay Area Air Quality Management District.
CO = carbon monoxide.
NO_X = oxides of nitrogen.
PM2.5 = particulate matter 2.5 microns in diameter or less.
PM10 = particulate matter 10 microns in diameter or less.
ROG = reactive organic gases.
SMAQMD = Sacramento Metropolitan Air Quality Management District.
YSAQMD = Yolo-Solano Air Quality Management District.

The analysis of construction-related emissions associated with Alternative 5 indicates that NO_X emissions would exceed the general conformity *de minimis* threshold under all years of construction (2014–2015) in the SFNA. There would be no violations of any other *de minimis* thresholds. As the SFNA is classified as a nonattainment area with regards to the Federal 8-hour ozone standard, the SEIP requires a general conformity determination to demonstrate how construction-related NO_X emissions under Alternative 5 will conform to the SFNA SIP.

E.1.5 Relationship to Other Environmental Analyses

A Draft EIS/EIR will be published for public review and comment in June 2013 providing an analysis of the APA (Alternative 5), with publication of the Final EIS/EIR anticipated in September 2013. The USACE is the lead Federal agency for the NEPA analysis documented in the EIS/EIR. The EIS/EIR was prepared to also be sufficient for purposes of CEQA.

NEPA requires an evaluation of air quality impacts associated with construction and operation of the proposed project. The analysis of impacts under CEQA were evaluated using the local thresholds of significance established by the YSAQMD, SMAQMD, and BAAQMD, while impacts under NEPA were made by evaluating whether the project would exceed general conformity *de minimis* thresholds. The Draft EIS/EIR presents the general conformity determination process and general findings in the general conformity determination for public and agency review, while the final general conformity determination will be published concurrent with the Record of Decision (ROD) for the Federal action.

E.1.6 Onsite Emission Reduction Measures

Mitigation measures to reduce onsite construction emissions were identified in Section 3.5.3, Effects and Mitigation Measures of the Draft EIS/EIR. These mitigation measures are consistent with NEPA and CEQA mitigation and minimization measures and will be required elements of the project, as

they will be included in the project's Mitigation Monitoring and Reporting Program, as required under CEQA. The mitigation measures required in the EIS/EIR to reduce project-related emissions are described below.

Mitigation Measure AIR-MM-1: Implement Measures to Reduce Exhaust Emissions of NO_X and PM10

According to the YSAQMD CEQA guidelines (Yolo-Solano Air Quality Management District 2007), the project lead agency is encouraged to explore and incorporate mitigation measures as technology advances and less emissive products become available at lower costs. Therefore, WSAFCA will require the construction contractor to implement the feasible and reasonable measures to reduce public nuisance and tailpipe emissions from diesel-powered construction equipment. This requirement will be incorporated into the construction contracts as part of the project's specifications. Depending on the exceedance amounts of NO_X and PM10 emissions, WSAFCA will require the construction contractor to implement either or all of following mitigation options.

- Reduce use, trips, and unnecessary idling of heavy equipment. Shut down idling equipment that is not used for more than 5 consecutive minutes as required by California law.
- Maintain all construction equipment in proper tune according to manufacturer's specifications.
- Use a modern equipment fleet meeting ARB's 1996 or newer certification standard for off-road heavy-duty diesel engines.
- Install emission control devices on older equipment to reduce CO, ROG, and NO_X emissions to levels equivalent to ARB's 1996 or newer certification standard.
- Locate stationary diesel-powered equipment and haul truck staging areas as far as practicable from sensitive receptors.
- Use existing power sources (e.g., power lines) or clean fuel generators rather than conventional diesel generators, when feasible
- Substitute gasoline-powered for diesel-powered equipment when feasible.
- Use reformulated and emulsified diesel fuels where feasible.
- Use alternatively fueled construction equipment on site where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane, or biodiesel.
- Use ARB and/or EPA-verified particulate traps and other appropriate controls (i.e., diesel oxidation catalyst or diesel particular filters) where feasible to reduce emissions of NO_X, DPM, and other pollutants at the construction site.
- Use towboats with newer or remanufactured engines that comply with the EPA Tier 2 or Tier 3 emission standards.
- The construction contractor will provide a plan, for approval by WSAFCA and the local air district, demonstrating that the heavy-duty off-road equipment to be used at the project sites, including owned, leased, and subcontractor equipment, will achieve a project-wide fleet-average reduction of 20% for NO_X and 45% for diesel particulate, compared to the most recent ARB fleet average at time of construction. A construction mitigation calculator

may be downloaded from the SMAQMD web site to perform the fleet average evaluation (Sacramento Metropolitan Air Quality Management District 2011b).

- The project representative will submit to WSAFCA and the local air district a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 horsepower, that will be used an aggregate of 40 or more hours during any portion of the construction project. The inventory will include the horsepower rating, engine production year, and projected hours of use for each piece of equipment. The inventory will be updated and submitted monthly throughout the duration of the project, except that an inventory will not be required for any 30-day period in which no construction activity occurs. At least 48 hours prior to the use of subject heavy-duty off-road equipment, the project representative will provide SMAQMD with the anticipated construction timeline, including start date, and name and phone number of the project manager and on-site foreman.
- The construction contractor will monitor and ensure that emissions from all off-road diesel-powered equipment used on the project site do not exceed 40% opacity for more than 3 minutes in any 1 hour. Any equipment found to exceed 40% opacity (or Ringelmann 2.0) will be repaired immediately, and WSAFCA and the local air district will be notified within 48 hours of identification of noncompliant equipment. A visual survey of all in-operation equipment will be made at least weekly, and a monthly summary of the visual survey results will be submitted throughout the duration of the project, except that the monthly summary will not be required for any 30-day period in which no construction activity occurs. The monthly summary will include the quantity and type of vehicles surveyed as well as the dates of each survey. The local air district and/or other officials may conduct periodic site inspections to determine compliance. Nothing in this section will supersede other local air district or state rules or regulations.

Mitigation Measure AIR-MM-2: Implement Fugitive Dust Control Plan

The construction contractor will implement all applicable and feasible fugitive dust control measures required by the YSAQMD including those listed below. This requirement will be incorporated into the construction contract.

- Post a publicly visible sign with the telephone number and person to contact regarding dust complaints. This person would respond and take corrective action within 48 hours. The phone number of the YSAQMD also will be visible to ensure compliance with the YSAQMD Rule 2.5, Nuisance.
- Water active unpaved areas at all construction sites at least twice daily in dry conditions, with the frequency of watering based on the type of operation, soil, and wind exposure.
- Prohibit all grading activities and water all areas of disturbed soil under windy conditions (winds more than 20 miles per hour).
- Limit on-site vehicles to a speed that prevents visible dust emissions to extend beyond unpaved roads.
- Cover all trucks hauling dirt, sand, or loose materials.
- Cover active and inactive storage piles where appropriate.
- Cover or hydroseed unpaved areas that will remain inactive for extended periods.
- Apply soil stabilizers to active and inactive areas where appropriate.

- Stabilize visible soil material and sediment at the entrance to construction sites .
- Sweep streets if visible soil material is carried out from the construction sites.
- Phase grading operations where appropriate.

However, with the implementation of above mitigations, daily fugitive dust emissions along with the diesel exhaust emissions would still exceed the YSAQMD's threshold for PM10. The construction contractor shall implement all feasible, cost-effective mitigation measures to reduce fugitive dust emissions.

Mitigation Measure AIR-MM-3: Provide Advance Notification of Construction Schedule and 24-Hour Hotline to Residents

WSAFCA will provide advance written notification of the proposed construction activities to all residences and other air quality-sensitive uses within 500 feet of the construction site. Notification will include a brief overview of the proposed project and its purpose, as well as the proposed construction activities and schedule. It will also include the name and contact information of WSAFCA's project manager or a representative for ensuring that reasonable measures are implemented to address the problem.

Mitigation Measure AIR-MM-4: Mitigate and Offset Construction-Generated NO_X Emissions to Net Zero (0) for Emissions in Excess of General Conformity *de Minimis* Threshold (Where Applicable) and to Quantities below Applicable YSAQMD and SMAQMD CEQA Thresholds

WSAFCA will reduce NO_X emissions generated by the construction of the project through the payment of off-site fees. NO_X emissions in excess of the Federal *de minimi*s threshold of 25 tons per year will be reduced to net zero (0). NO_X emissions not in excess of the *de minimis* thresholds, but above the YSAQMD's and SMAQMD's NO_X thresholds, will be reduced to quantities below thresholds.

WSAFCA will make best efforts to enter into a development mitigation contract with YSAQMD and SMAQMD to reduce NO_X emissions generated by the construction through contributions to SMAQMD's Heavy-Duty Low-Emission Vehicle Incentive Programs (HDLEVIP). The HDLEVIP is designed to reduce NO_X, PM, and ROG from on- and off-road sources.

SMAQMD's incentive programs are a means of funding projects and programs capable of achieving emissions reductions. The payment fee is based on the average cost to achieve 1 ton per day (tpd) of reductions based on the average cost for reductions over the previous year. Onroad reductions averaged (nominally) $44 million ($NO_X$ only) and off-road reductions averaged $36 million ($NO_X$ only) over the previous year, thus working out to approximately $40 million per 1 tpd of reductions. This roughly correlates to the average cost effectiveness of the Carl Moyer Incentive Program.

Using the SMAQMD's local mitigation contract programs, WSAFCA will enter into mitigation contracts with YSAQMD and SMAQMD to reduce NO_X emissions to the required levels. The required levels are:

- For NO_X emissions in excess of the Federal *de minimis* threshold: **net zero (0)**.

- For NO_X emissions not in excess of *de minimis* threshold but above YSAQMD's and SMAQMD's thresholds: **below the appropriate CEQA threshold levels**.

Implementation of this mitigation would require WSAFCA to adopt the following specific responsibilities.

- Consult with the YSAQMD and SMAQMD in good faith to enter into a mitigation contract for the HDLEVIP. For SIP purposes, the necessary reductions must be achieved (contracted and delivered) by the applicable year in question (i.e., emissions generated in year 2014 would need to be reduced off-site in 2014). Funding would need to be received prior to contracting with participants and should allow sufficient time to receive and process applications to ensure off-site reduction projects are funded and implemented prior to commencement of SEIP activities being reduced. This would roughly equate to the equivalent of 2 years prior to the required mitigation; additional lead time may be necessary depending on the level of off-site emission reductions required for a specific year. In negotiating the terms of the mitigation contract, the WSAFCA, YSAQMD, and SMAQMD should seek clarification and agreement on air district responsibilities, including those following.
    - Identification of appropriate off-site mitigation fees required for the project.
    - Timing required for obtaining necessary off-site emission credits.
    - Processing of mitigation fees surrendered by WSAFCA.
    - Verification of emissions inventories submitted by WSAFCA.
    - Verification that off-site fees are applied to appropriate mitigation programs within the SFNA.
- Quantify mitigation fees required to satisfy the appropriate reductions. As noted above, the payment fees may vary by year and are sensitive to the number of projects requiring reductions within the SFNA. The schedule in which payments are surrendered to the air district also influences overall cost. For example, a higher rate on a per ton basis will be required for project elements that need accelerated equipment turnover to achieve near-term reductions, whereas project elements that are established to contract to achieve far-term reductions will likely pay a lower rate on a per-tonnage basis.
- Develop a compliance program to calculate emissions and collect fees from the construction contractors for payment to the appropriate air district. The program will require, as a standard or specification of their contract, construction contractors to identify construction emissions and their share of required off-site fees, if applicable. Based on the emissions estimates, WSAFCA will collect fees from the individual construction contractors (as applicable) for payment to the air district. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through on-site mitigation (Mitigation Measure AIR-MM-1), as the greater the emissions reductions that can be achieved by on-site mitigation, the lower the required off-site fee. All control strategies must be verified by YSAQMD and SMAQMD.
- Conduct daily and annual emissions monitoring to ensure on-site emissions reductions are achieved and no additional mitigation payments are required. The construction contractor will be required to ensure the requirement is met. This requirement will be incorporated into the construction contracts as part of the project's specifications. Excess off-site funds can be carried from previous to subsequent years in the event that additional reductions are

achieved by on-site mitigation. At the end of the project, if it is determined that excess offset funds remain (outstanding contracts and administration over the final years of the contracts will be taken into consideration) the SMAQMD, YSAQMD, and WSAFCA Proponents shall determine the disposition of final funds (e.g., additional emission reduction projects to offset underperforming contracts, return of funds to WSAFCA, etc.).

E.1.7 Regulatory Procedures

The general conformity regulations establish certain procedural requirements that must be followed when preparing a general conformity evaluation. The major applicable procedural issues associated with the general conformity demonstration and a description of how these requirements are met are presented in this section. As previously indicated, the Draft EIS/EIR presents the general conformity determination for public and agency review. The final general conformity determination will be published concurrent with the ROD for the Federal action pursuant to 40 CFR §93.156.

E.1.7.1 Use of Latest Planning Assumptions

The general conformity regulations require that the analysis use the latest planning assumptions based on data (e.g., population, employment, travel, and congestion) made available by the area's Metropolitan Planning Organizations (MPOs) (40 CFR §93.159[a]).

As the analysis of emissions resulting from construction-related activities would not require the use of population, employment, travel, and congestion data, this section is not applicable to the project.

E.1.7.2 Use of Latest Emissions Estimation Techniques

The general conformity regulations require the use of the latest and most accurate emission estimation techniques available, unless such techniques are inappropriate (40 CFR §93.159[b]).

Per guidance from the YSAQMD, construction emissions were estimated using the most recent version of the ARB's emission factor program, EMission FACtors 2011 (EMFAC2011), which is the emission model used in the preparation of the SIP.

E.1.7.3 Major Construction Phase Activities

Project-specific data, including construction equipment lists and the construction schedule, were used to forecast construction emissions associated with the project using construction activity data provided by HDR, WSAFCA's professional engineering team. Calculations were performed for each year of construction (2014–2015).

E.1.7.4 Emissions Scenarios

The general conformity regulations require that the analysis reflect certain emission scenarios (40 CFR §93.159[d]). Specifically, these scenarios generally include the evaluation of the direct and indirect emissions from a proposed project for the following years.

1. The year mandated in the CAA for attainment and for maintenance areas, the farthest year for which emissions are projected in the approved maintenance plan.

2. The year during which the total of direct and indirect emissions for the Federal action are projected to be the greatest on an annual basis.
3. Any year for which the applicable SIP specifies an emissions budget.

Question 1 is not applicable to the construction analysis, as construction years associated with Alternative 5 (2014–2015) do not include the year in which attainment is designated for the region for the 8-hour ozone standard. Question 2 is not applicable to the construction analysis, as there is currently no approved 8-hour ozone SIP in which there is an approved emissions budget. The analysis of construction activities evaluates the construction period of 2014–2015, with maximum direct and indirect emissions expected in the first year (see Table E.1-8 below).

E.1.8 Applicability Analysis

The general conformity rule applies to all Federal actions located in nonattainment and maintenance areas that are not exempt from general conformity (are either covered by Transportation Conformity or listed in the rule), are not covered by a presumed-to-conform approved list[2], or do not have clearly *de minimis* emissions. The first step in a general conformity evaluation is to determine whether the project is located in a Federal nonattainment or a maintenance area.

E.1.8.1 Attainment Status of the Study Area

As previously indicated in Table E.1-4, activities occurring under Contract D are located in an area currently designated moderate maintenance for the federal CO standard and marginal nonattainment for the federal 8-hour ozone standard. Activities occurring between Reaches 1 and 2 (Contract A) are located in an area designated severe nonattainment for the federal 8-hour ozone standard. The entire project area, including all activities under Contracts A through D, is designated a nonattainment area for the federal PM2.5 standard. Consequently, to fulfill general conformity requirements, an analysis must be undertaken to identify whether the proposed project's total emissions of ozone, PM2.5, and CO are below the appropriate general conformity *de minimis* levels indicated in Table E.1-5.

E.1.8.2 Exemptions from General Conformity Requirements

As previously indicated, the general conformity rule applies to all Federal actions located in nonattainment and maintenance areas that are not exempt from general conformity (are either covered by Transportation Conformity or listed in the rule), are not covered by a presumed-to-conform approved list, or do not have clearly *de minimis* emissions. In addition, the general conformity rule applies only to direct and indirect emissions associated with the portions of any Federal action that are subject to New Source Review (i.e., do not include stationary industrial sources requiring air quality permits from local air pollution control agencies) for which a Federal permitting agency has directly caused or initiated, has continued program responsibility for, or can practically control. None of these exemptions from general conformity apply to the proposed project.

[2] Category of activities designated by a Federal agency as having emissions below *de minimis* levels or otherwise do not interfere with the applicable SIP or the attainment and maintenance of the national ambient air quality standard.

E.1.8.3 Applicability for Federal Action

If it is determined a project is not exempt from general conformity, the applicability of the general conformity requirements to the Federal action is evaluated by comparing total direct and indirect emissions for each calendar year of to the appropriate general conformity *de minimis* thresholds indicated in Table E.1-5.

In the event that total direct and indirect emissions attributable to the Federal action are below the *de minimis* thresholds for a pollutant, that pollutant is excluded from general conformity requirements and no further analysis is required, as it is assumed these pollutants would conform to the SIP. Those pollutants that could not be excluded from applicability must undergo a general conformity evaluation.

If the general conformity evaluation indicates that total direct and indirect emissions attributable to the Federal action are in excess of any of the general conformity *de minimis* thresholds, the applicant must perform a conformity determination. A conformity determination is made by satisfying any of the following requirements.

- Showing that the emission increases caused by the Federal action are included in the SIP.
- Demonstrating that the State agrees to include the emission increases in the SIP.
- Offsetting the action's emissions in the same or nearby area.
- Mitigating to reduce the emission increase.
- Utilizing a combination of the above strategies.

E.1.8.4 *de Minimis* Emissions Rates

General conformity *de minimis* thresholds applicable to the project are summarized in Table E.1-5.

E.1.9 Construction Activities Considered

The project would rehabilitate 5.6 miles of existing levee within Yolo County. Operation of the new facilities would require periodic maintenance, although activities are expected to be less extensive than existing conditions and would only take place over a few days per year. Accordingly, long-term operational emissions are part of the existing environmental baseline and thus would not create a substantial source of new emissions. The general conformity determination therefore focuses exclusively on construction-related emissions because there would be no effect related to project operations.

The EIS/EIR estimates construction-related emissions for each alternatives currently being considered for the SEIP. However, this conformity determination only includes an analysis of Alternative 5 because it has been selected as the APA, as discussed in Section E.1.2 above. For additional information on Alternatives 1, 2, 3, and 4, please refer to Section 3.5, Air Quality.

Construction of Alternative 5 would generate criteria pollutant emissions that would result in short-term impacts on ambient air quality in the study. Emissions would originate from mobile and stationary construction equipment exhaust, employee vehicle exhaust, haul truck exhaust, and dust from earthmoving and clearing the land. Construction-related emissions vary substantially

depending on the level of activity, length of the construction period, specific construction operations, types of equipment, number of personnel, wind and precipitation conditions, and soil moisture content.

Emissions rates for major construction activities were calculated based on information provided by HDR (Appendix E.2), as summarized below.

- Levee construction would occur in two years (2014–2015). The maximum daily and annual activity would take place in the first year, when majority of project segments would undergo extensive construction in this year.
- The type of each construction equipment, number of pieces of each type, and the duration of each type of construction activity. The forecast equipment usage is listed in Appendix E.2.
- Duration of each type of construction activity in each project segment.
- Quantities of borrow material, spoil material, and supplies to be delivered to the project, for each project segment.
- Number of haul truck trips and hauling distances for importing and exporting materials.
- Operating parameters for each type of construction equipment (horsepower and hours per day of usage).

For the EIS/EIR, the project alternatives were evaluated using conservative construction scenarios referred to as "unfavorable scenarios" to estimate the maximum construction emissions generated by each alternative. The unfavorable scenarios assumed all the excavated material and demolished debris would be hauled off site and would not be reused for the project, which would result in a longer construction schedule, requiring additional equipment and longer truck hauling trips, resulting in larger fleet sizes. Detailed assumptions of the construction data for unfavorable scenarios of project alternatives are provided in Appendix E.2.

Models, tools, and assumptions used to calculate the emissions associated with off-road equipment, on-road vehicles, on-water hauling, site fugitive dust, and electricity consumptions are described below.

Table E.1-6 summarizes the emission sources associate with the project construction that would occur in the YSAQMD, SMAQMD, and BAAQMD.

Table E.1-6. Emission Sources occurring in the YSAQMD, SMAQMD, BAAQMD

Emission Sources	YSAQMD	SMAQMD	BAAQMD
Off-Road Construction Equipment	X		
On-Road Vehicles	X	X	
On-Water Towboats	X	X	X
Dust Emissions from Land Disturbance and Earth Moving	X		
Off-Site Material Borrow, including fugitive dust, off-road construction equipment, and on-road vehicles associated with the activity.	X	X	

SMAQMD = Sacramento Metropolitan Air Quality Management District.
YSAQMD = Yolo-Solano Air Quality Management District.
BAAQMD = Bay Area Air Quality Management District.

E.1.9.1 Construction Schedule

Table E.1-7 outlines the expected construction schedule and phases for Alternative 5.

Table E.1-7. Construction Schedule and Phasing (Alternative 5)

		Construction Time Frame	
Segment	**Construction Phase/Activity**	**Start**	**Max Days**
Year 1			
C	Roadway Removal	May 1	1
	Building Demo	May 1	7
	Utility Relocation	May 10	22
	Stripping	June 1	27
	Levee Degrade	June 28	37
	Soil Borrow Extraction/Levee Placement	August 3	61
	Planting	October 1	27
	Irrigation	October 1	15
	Drainage	October 4	1
	Roadway Replace	October 5	2
	Rip Rap Installation	October 7	44
D	Roadway Removal	May 1	1
	Building Demo	May 1	17
	Utility Relocation	May 18	11
	Stripping	May 28	11
	SB Cutoff Wall Installation	June 9	7
	Soil Borrow Extraction/Levee Placement	June 16	15
	Drainage	July 1	8
	Roadway Replace	July 9	2
	Rip Rap Installation	July 11	1
E	Stripping	May 1	10
	Utility Relocation	May 11	18
	SB Cutoff Wall Installation	June 26	11
	Soil Borrow Extraction/Levee Placement	May 29	23
	Drainage	June 21	1
	Roadway Replace	June 22	4
	Rip Rap Installation	June 26	4
F	Existing Pump Station Removal	May 1	2
	Roadway Removal	May 1	1
	Building Demo	May 1	30
	Utility Relocation	May 31	29
	Stripping	June 29	29
	Levee Degrade	July 28	45
	Soil Borrow Extraction/Levee Placement	September 11	62
	Drainage	November 12	3
	Roadway Replace	November 15	5
	Rip Rap Installation	November 20	58

Segment	Construction Phase/Activity	Construction Time Frame	
		Start	Max Days
G	Building Demo	May 1	5
	Utility Relocation	May 6	13
	Stripping	May 19	10
	SB Cutoff Wall Installation	May 29	10
	Soil Borrow Extraction/Levee Placement	June 8	10
	Drainage	June 18	1
	Roadway Replace	June 19	1
	Rip Rap Installation	June 20	20
Year 2			
A	Roadway Removal	May 1	2
	Building Demo	May 1	25
	Utility Relocation	May 26	18
	Stripping	June 13	17
	Levee Degrade	June 30	70
	SB Cutoff Wall Installation	September 8	9
	Soil Borrow Extraction/Levee Placement	September 17	19
	Drainage	October 6	2
	Roadway Replace	October 8	4
	Rip Rap Installation	October 12	21
B	Roadway Removal	May 1	1
	Building Demo	May 1	23
	Utility Relocation	May 24	23
	Stripping	June 16	31
	Levee Degrade	July 17	39
	SB Cutoff Wall Installation	August 25	1
	Drainage	August 26	4
	Soil Borrow Extraction/Levee Placement	August 26	80
	Roadway Replace	August 30	6
	Planting	October 1	3
	Irrigation	October 1	4
	Rip Rap Installation	November 14	38
C	Inlet Outlet Degrade	November 2	11
F	Inlet Outlet Degrade	November 9	11

E.1.9.2 Off-Road Equipment

Exhaust emissions from operation of on-site equipment are calculated using URBEMIS 2007 model (Version 9.2.4). The load factors for construction equipment are updated to reflect the values presented the 2011 Carl Moyer Guidelines, which are based on ARB's most recently released load factor data (California Air Resources Board 2011b).

E.1.9.3 On-Road Vehicles

Exhaust emissions from truck haul trips and worker commute trips are calculated using the EMFAC2011 emissions model. The numbers of haul trips and hauling distances are provided by HDR for each construction year. The numbers of workers required to complete construction activities are estimated based on a daily workforce of 20 workers plus one person per piece of construction equipment. The commute distance is based on the average work-related trip length estimated by the URBEMIS. It is assumed that 70% of the truck and commute trips would be generated in the YSAQMD and 30% of the trips would be generated in the SMAQMD.

E.1.9.4 On-Water Towboats

The project would use barges powered by towboats to carry the riprap material from the San Rafael Rock Quarry through the Bay-Delta and the Sacramento River to the project sites. Exhaust emissions from towboats are quantified using emission factors and the load factor developed for EPA (2009). For a conservative estimate, the emission factors for Tier 0 Category 2 towboats are used to calculate the emissions. The average one-way hauling distance between the San Rafael Rock Quarry and the project area is approximately 90 miles, of which 22.5 miles would be in the YSAQMD, 36 miles in the SMAQMD, and 41.5 miles in the BAAQMD.

E.1.9.5 Fugitive Dust from Land Clearing

Fugitive dust emissions generated by building demolition, land disturbance, and earth moving are quantified using the URBEMIS with the disturbed acreages and earthwork volume provided by HDR.

E.1.9.6 Off-Site Material Borrow

Sources of borrow material are described in Chapter 2. For the air quality and GHG analysis, it is conservatively assumed that embankment material excavated as part of construction would not be reused as the levee fill material to analyze the maximum air emissions generated by material borrow activities. The borrow material is assumed to be imported from the dredged material previously removed from the DWSC to account for the longest truck hauling distance (6.6 round trip miles) among the potential off-site borrow pits identified for the project. The construction emissions associated with on-road hauling trucks, off-road equipment, and fugitive dust at the borrow sites would be generated entirely within the YSAQMD. For construction emissions associated with worker commute trips, it is assumed that 70% of the truck and commute trips would be generated in the YSAQMD and 30% of the trips would be generated in the SMAQMD

E.1.10 Estimated Emissions Rates and Comparison to *de Minimis* Thresholds

Annual criteria pollutant emissions resulting from construction of Alternative 5 are presented in Table E.1-8. Emissions estimates include implementation of onsite mitigation identified in the EIS/EIR (AQ-MM-1 through AQ-MM-3). Violations of the Federal *de minimis* thresholds are shown in <u>underlined</u> text.

Table E.1-8. Annual Construction Emissions for Alternative 5

Construction Year	Annual Emissions in Tons				
	ROG	NO_X	CO	PM10	PM2.5
Emissions generated in SFNA (YSAQMD and SMAQMD[a]) subject to conformity					
Year 1 On-site Construction	4.3	34.2	17.1	0.2	2.9
Year 1 Off-site Soil Borrow	1.6	12.7	5.9	0.0	1.3
Year 1 Total	5.9	46.9	22.9	0.2	4.2
Year 2 On-site Construction	3.3	27.0	12.7	0.1	1.9
Year 2 Off-site Soil Borrow	1.0	8.1	3.7	0.0	0.9
Year 2 Total	4.3	35.0	16.4	0.1	2.8
General Conformity *de Minimis* Threshold	25	25	100	100	100
Exceed Threshold?	No	**Yes**	No	No	No
Emissions generated in BAAQMD/SFBAAB[b]					
Year 1	0.1	2.6	1.3	0.2	0.2
Year 2	0.1	1.1	0.5	0.1	0.1
CEQA Threshold					
Exceed Threshold?					
General Conformity *de Minimis* Threshold	50	100	100	NA	100
Exceed Threshold?	No	No	No		No

[a] PM10 emissions are for those within Sacramento County (SMAQMD), as Yolo County (YSAQMD) is an attainment area for PM10 and is not subject to general conformity requirements for PM10.
[b] Only on-water exhaust emissions generated from towboats are expected to occur within the BAAQMD.

E.1.11 Regional Effects

As shown in Table E.1-8, construction of Alternative 5 would exceed the federal *de minimis* threshold for NO_X in the SFNA. There would be no violations of any other *de minimis* thresholds. NO_X is a precursor to ozone, for which SFNA are in nonattainment for the NAAQS. Since the emissions exceed the Federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate ozone SIP for each year of construction (2014–2015). No additional analyses are required for the other pollutants or contracts.

E.1.12 General Conformity Evaluation

As disused in Section E.1.1.2., General Conformity Requirements, a positive general conformity determination can be made through one of five criteria (project inclusion in the SIP, revision to the SIP, offsets, additional mitigation, and/or a combination of strategies). This section summarizes the findings that were used to make the determination for the SEIP.

E.1.12.1 Conformity Requirements for the Applicant-Preferred Alternative

As described in Section E.1.2, Alternative 5 has been selected as APA. As shown in Table E.1-8, construction-related NO_X emissions generated Alternative 5 exceed the Federal *de minimis* threshold (25 tons per year) during both construction years in the SFNA. The highest annual emissions are 49 tons, which occur in the first year, while emissions in the second year would amount to 31 tons. Because NO_X emissions exceed the Federal *de minimis* threshold, a conformity determination is required for construction-related NO_X emissions generated by Alternative 5 for years 2014 and 2015.

E.1.12.2 Compliance with Conformity Requirements

USACE herein demonstrates that construction-related NO_X emissions generated by the APA would not result in a net increase in regional NO_X emissions within the SFNA. This will be achieved by offsetting NO_X emissions generated during both years of construction (2014 and 2015) to net zero. Purchasing offsets is consistent with the general conformity rule, which states that a positive conformity determination may be reached if project-related emissions are offset to net zero for all years in which pollutants exceed applicable *de minimis* thresholds (refer to Section E.1.1.2).

The project proponents (WSAFCA) will enter into a development mitigation contract with YSAQMD and SMAQMD to reduce NO_X emissions generated by the construction of the APA to net zero through the procurement of offsite mitigation fees. The requirement for the mitigation contract would be imposed on the project through the following mitigation measure from the EIS/EIR.

Mitigation Measure AIR-MM-4: Mitigate and Offset Construction-Generated NO_X Emissions to Net Zero (0) for Emissions in Excess of General Conformity *de Minimis* Threshold (Where Applicable) and to Quantities below Applicable YSAQMD and SMAQMD CEQA Thresholds

WSAFCA will reduce NO_X emissions generated by the construction of the project through the payment of off-site fees. NO_X emissions in excess of the Federal *de minimi*s threshold of 25 tons per year will be reduced to net zero (0). NO_X emissions not in excess of the *de minimis* thresholds, but above the YSAQMD's and SMAQMD's NO_X thresholds, will be reduced to quantities below thresholds.

WSAFCA will make best efforts to enter into a development mitigation contract with YSAQMD and SMAQMD to reduce NO_X emissions generated by the construction through contributions to SMAQMD's HDLEVIP. The HDLEVIP is designed to reduce NO_X, PM, and ROG from on- and off-road sources.

SMAQMD's incentive programs are a means of funding projects and programs capable of achieving emissions reductions. The payment fee is based on the average cost to achieve 1 ton per day (tpd) of reductions based on the average cost for reductions over the previous year. Onroad reductions averaged (nominally) $44 million ($NO_X$ only) and off-road reductions averaged $36 million ($NO_X$ only) over the previous year, thus working out to approximately $40 million per 1 tpd of reductions. This roughly correlates to the average cost effectiveness of the Carl Moyer Incentive Program.

Using the SMAQMD's local mitigation contract programs, WSAFCA will enter into mitigation contracts with YSAQMD and SMAQMD to reduce NO_X emissions to the required levels. The required levels are:

- For NO_X emissions in excess of the Federal *de minimis* threshold: **net zero (0)**.
- For NO_X emissions not in excess of *de minimis* threshold but above YSAQMD's and SMAQMD's thresholds: **below the appropriate CEQA threshold levels**.

Implementation of this mitigation would require WSAFCA to adopt the following specific responsibilities.

- Consult with the YSAQMD and SMAQMD in good faith to enter into a mitigation contract for the HDLEVIP. For SIP purposes, the necessary reductions must be achieved (contracted and delivered) by the applicable year in question (i.e., emissions generated in year 2014 would need to be reduced off-site in 2014). Funding would need to be received prior to contracting with participants and should allow sufficient time to receive and process applications to ensure off-site reduction projects are funded and implemented prior to commencement of SEIP activities being reduced. This would roughly equate to the equivalent of 2 years prior to the required mitigation; additional lead time may be necessary depending on the level of off-site emission reductions required for a specific year. In negotiating the terms of the mitigation contract, the WSAFCA, YSAQMD, and SMAQMD should seek clarification and agreement on air district responsibilities, including those following.
    - Identification of appropriate off-site mitigation fees required for the project.
    - Timing required for obtaining necessary off-site emission credits.
    - Processing of mitigation fees surrendered by WSAFCA.
    - Verification of emissions inventories submitted by WSAFCA.
    - Verification that off-site fees are applied to appropriate mitigation programs within the SFNA.
- Quantify mitigation fees required to satisfy the appropriate reductions. As noted above, the payment fees may vary by year and are sensitive to the number of projects requiring reductions within the SFNA. The schedule in which payments are surrendered to the air district also influences overall cost. For example, a higher rate on a per ton basis will be required for project elements that need accelerated equipment turnover to achieve near-term reductions, whereas project elements that are established to contract to achieve far-term reductions will likely pay a lower rate on a per-tonnage basis.
- Develop a compliance program to calculate emissions and collect fees from the construction contractors for payment to the appropriate air district. The program will require, as a standard or specification of their contract, construction contractors to identify construction emissions and their share of required off-site fees, if applicable. Based on the emissions estimates, WSAFCA will collect fees from the individual construction contractors (as applicable) for payment to the air district. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through on-site mitigation (Mitigation Measure AIR-MM-1), as the greater the emissions reductions that can be achieved by on-site mitigation, the lower the required off-site fee. All control strategies must be verified by YSAQMD and SMAQMD.

- Conduct daily and annual emissions monitoring to ensure on-site emissions reductions are achieved and no additional mitigation payments are required. The construction contractor will be required to ensure the requirement is met. This requirement will be incorporated into the construction contracts as part of the project's specifications. Excess off-site funds can be carried from previous to subsequent years in the event that additional reductions are achieved by on-site mitigation. At the end of the project, if it is determined that excess offset funds remain (outstanding contracts and administration over the final years of the contracts will be taken into consideration) the SMAQMD, YSAQMD, and WSAFCA Proponents shall determine the disposition of final funds (e.g., additional emission reduction projects to offset underperforming contracts, return of funds to WSAFCA, etc.).

E.1.13 Reporting

USACE is issuing this general conformity determination for public and agency review for a 30-day period as required by 40 CFR §§93.155 and 93.156. Emissions from construction of the project have been assessed and quantified using standard and accepted tools, techniques, and emission factors. Additional technical details are provided in the EIS/EIR. The air quality analysis, including this draft conformity determination, is based on consultation with YSAQMD and SMAQMD.

E.1.13.1 General Conformity Determination

The general conformity determination will be available for a 45-day public review in conjunction with the circulation of the draft SEIP EIS/EIR. USACE will provide copies of this general conformity determination to the appropriate regional offices of the EPA, ARB, YSAQMD and SMAQMD, and other coordinating agencies. The USACE will also announce the availability of the general conformity determination in the Chico Enterprise Record, Appeal-Democrat, and Gridley Herald. A copy of this conformity determination will be made available on USACE's and WSAFCA's websites, as well as at local libraries.

E.1.13.2 Revaluation and Redetermination of General Conformity

General conformity determinations are valid for a period of 5 years after the date of public notification for the final documentation (40 CFR §93.157(a)). Ongoing Federal activities at a given site that show continuous progress after a 5-year period do not require a redetermination so long as the activities are within the scope of the final conformity determination. Because construction of the APA is expected to require no more than 2 years, the final general conformity determination will remain valid through completion of the Federal action.

E.1.14 Findings and Conclusions

Pursuant to 40 CFR Part 93 Subpart B, USACE has conducted a general conformity evaluation as part of the environmental review of the SEIP. The project is subject to the general conformity rule because it is located an area that is designed nonattainment for the 8-hour ozone standard (severe and moderate), nonattainment for PM2.5, and a (partial) moderate maintenance area for CO. USACE

conducted the general conformity evaluation in consultation with air districts in the study area (YSAQMD and SMAQMD). Moreover, the emissions analyses are based on accepted standards and are in compliance with all applicable regulatory criteria and procedures.

Based on project-specific construction analysis, NO_X emissions generated by construction of the APA would exceed the Federal *de minimis* threshold during all years of construction (2014 and 2015) in the SFNA. USACE concluded that construction emissions would not result in a net increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measure AQ-MM-4, which requires the payment of offsite mitigation fees. Accordingly, USACE has determined that the APA, as designed, will conform to the approved SIP, based on the findings below.

- A commitment from the WSAFCA that NO_X emissions generated by the APA will be offset consistent with the applicable Federal regulations through a development mitigation contract with the YSAQMD and SMAQMD. The following actions will be taken to execute the conformity determination contained herein.
    - WSAFCA, YSAQMD, and SMAQMD will enter into a contractual agreement to mitigate the NO_X emissions in excess of the Federal *de minimis* threshold to net zero.
    - WSAFCA will surrender moneys to SMAQMD's Heavy-Duty Low-Emission Vehicle Incentive Programs (HDLEVIP) to fund grants for projects that achieve the necessary emission reductions.
    - SMAQMD will seek and implement the necessary emission reduction measures, using WSAFCA funds.
    - SMAQMD will serve in the role of administrator of the emissions reduction projects and verifier of the successful mitigation effort.

Therefore, USACE herewith concludes that the APA, as designed, conforms to the purpose of the approved SIP and is consistent with all applicable requirements.

E.1.15 References

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Appendix E.2

Construction Data, Calculation Spreadsheets, and Supporting Information

SOUTHPORT SACRAMENTO RIVER EIP SITE
HIGH EMISSIONS ESTIMATE SUMMARY - (Unfavorable Scenario)

CMA #1 PHASE 1 Project Site Related Activities

S	Construction Phase	Equipment	#	Days	Truck Trips	RT Miles	Daily Earthwork Rate	Projected Time Frame	
C	Roadway Replace	Dump Truck	9	1	15	20			
C	Roadway Replace	Vibratory Compactor	1	1					
C	Roadway Replace	Asphalt Paver	1	1					
C	Roadway Replace	Asphalt Compactor	1	1					
C	Roadway Replace	Motor Grader	1	1					
C	Roadway Replace	Bulldozer	1	1					
C	Roadway Replace	Worker Commute	5	1	1	22			
C	Roadway Replace								
C	Stripping	Wheel Tractor Scraper	3	26			4.79 Ac per day	May 1 to	June 2
C	Stripping	Bulldozer	1	33					
C	Stripping	Dump Truck	10	33	17	20			
C	Stripping	Excavator	1	33					
C	Stripping	Worker Commute	15	33	1	22			
C	Stripping	Dust Emission	4.8	33					
C									
C	Soil Borrow Extraction/	Scraper	14	38			21,537 CY per day	June 3 to	July 10
C	Soil Borrow Extraction/	Excavator	6	38					
C	Soil Borrow Extraction/	Dump Truck	117	38	0	0			
C	Soil Borrow Extraction/	Sheeps Foot Compactor	1	38					
C	Soil Borrow Extraction/	Bulldozer	2	38					
C	Soil Borrow Extraction/	Motor Grader	1	38					
C	Soil Borrow Extraction/	Water Truck	2	6					
C	Soil Borrow Extraction/	Worker Commute	26	38	1	22			
C	Soil Borrow Extraction/	Dust Emission	2.2	38					
C									
C	Rip Rap Installation	Crane	10	38				July 12 to	August 18
C	Rip Rap Installation	Bulldozer	5	38					
C	Rip Rap Installation	Hydraulic Excavator	5	38					
C	Rip Rap Installation	Towboat	1	38	1.5	180			
C	Rip Rap Installation	Worker Commute	41	38	1	22			
C	Rip Rap Installation								
C	Utility Relocation	Utility/Pole Truck	4	22				May 10 to	May 31
C	Utility Relocation	Utility/Pole Truck	4	22					
C	Utility Relocation	Worker Commute	8	22	1	22			
C	Utility Relocation								
C	Drainage	Excavator	2	1				October 4 to	October 4
C	Drainage	Front End Loader	1	1					
C	Drainage	Dump Truck	3	1					
C	Drainage	Compressor	1	1					
C	Drainage	Worker Commute	4	1	1	22			
C	Drainage								
D	Building Demo	Bulldozer	1	17				May 1 to	May 17
D	Building Demo	Front End Loader	1	17					
D	Building Demo	Excavator	1	17					
D	Building Demo	Haul Truck	1	1	7	20			
D	Building Demo	Worker Commute	3	17	1	22			
D	Building Demo	Dust Emission	1.0	1					
D	Building Demo								
D	Roadway Removal	Cold Planer	1	1				May 1st	
D	Roadway Removal	Scraper	1	1					
D	Roadway Removal	Dump Truck	1	1	17	20			
D	Roadway Removal	Bulldozer	1	1					
D	Roadway Removal	Excavator	1	1					
D	Roadway Removal	Worker Commute	4	1	1	22			
D	Roadway Removal								
D	Roadway Replace	Dump Truck	13	3	14	20		June 3 to	June 5
D	Roadway Replace	Vibratory Compactor	1	3					

D	Roadway Replace	Asphalt Paver	1	1					
D	Roadway Replace	Asphalt Compactor	1	3					
D	Roadway Replace	Motor Grader	1	3					
D	Roadway Replace	Bulldozer	1	3					
D	Roadway Replace	Worker Commute	5	3	1	22			
D	Roadway Replace								
D	Stripping	Wheel Tractor Scraper	3	5			4.80 Ac per day	May 18	May 23
D	Stripping	Bulldozer	1	6					
D	Stripping	Dump Truck	10	6	17	20			
D	Stripping	Excavator	1	6					
D	Stripping	Worker Commute	5	6	1	22			
D	Stripping	Dust Emission	4.8	6					
D	Stripping								
D	SB Cutoff Wall Installati	Dump Truck	3	2	53	0.25		May 24	May 25
D	SB Cutoff Wall Installati	Bulldozer	1	2					
D	SB Cutoff Wall Installati	Long Reach Excavator	1	2					
D	SB Cutoff Wall Installati	Hydraulic Excavator	1	2					
D	SB Cutoff Wall Installati	Rough Terrain/Telehandler F	1	2					
D	SB Cutoff Wall Installati	Worker Commute	4	2	1	22			
D	SB Cutoff Wall Installation								
D	Soil Borrow Extraction/	Scraper	10	8			14,539 CY per day	May 26	June 2
D	Soil Borrow Extraction/	Excavator	4	8					
D	Soil Borrow Extraction/	Dump Truck	84	8	0	0			
D	Soil Borrow Extraction/	Sheeps Foot Compactor	1	8					
D	Soil Borrow Extraction/	Bulldozer	2	8					
D	Soil Borrow Extraction/	Motor Grader	1	8					
D	Soil Borrow Extraction/	Water Truck	2	2					
D	Soil Borrow Extraction/	Worker Commute	20	8	1	22			
D	Soil Borrow Extraction/	Dust Emission	1.5	8					
D	Soil Borrow Extraction/Levee Placement								
D	Rip Rap Installation	Crane	2	33				June 6	July 8
D	Rip Rap Installation	Bulldozer	1	33					
D	Rip Rap Installation	Hydraulic Excavator	1	33					
D	Rip Rap Installation	Towboat	1	33	1.5	180			
D	Rip Rap Installation	Worker Commute	5	33	1	22			
D	Rip Rap Installation								
D	Utility Relocation	Utility/Pole Truck	3	11				May 18 to	May 28
D	Utility Relocation	Utility/Pole Truck	3	11					
D	Utility Relocation	Worker Commute	6	11	1	22			
D	Utility Relocation								
D	Drainage	Excavator	3	3				July 1 to	July 8
D	Drainage	Front End Loader	1	3					
D	Drainage	Dump Truck	6	3					
D	Drainage	Compressor	1	8					
D	Drainage	Worker Commute	5	8	1	22			
D	Drainage								
E	Roadway Replace	Dump Truck	14	3	14	20		May 29	
E	Roadway Replace	Vibratory Compactor	2	4					
E	Roadway Replace	Asphalt Paver	1	1					
E	Roadway Replace	Asphalt Compactor	1	4					
E	Roadway Replace	Motor Grader	2	4					
E	Roadway Replace	Bulldozer	2	4					
E	Roadway Replace	Worker Commute	8	4	1	22			
E	Roadway Replace								

E	Stripping	Wheel Tractor Scraper	3	6			4.53 Ac per day	May 1 to	May 7
E	Stripping	Bulldozer	1	7					
E	Stripping	Dump Truck	10	7	17	20			
E	Stripping	Excavator	1	7					
E	Stripping	Worker Commute	5	7	1	22			
E	Stripping	Dust Emission	4.5	7					
E	Stripping								
E	SB Cutoff Wall Installati	Dump Truck	3	9	53	0.25		May 8 to	May 16
E	SB Cutoff Wall Installati	Bulldozer	1	9					
E	SB Cutoff Wall Installati	Long Reach Excavator	1	9					
E	SB Cutoff Wall Installati	Hydraulic Excavator	1	9					
E	SB Cutoff Wall Installati	Rough Terrain/Telehandler F	1	9					
E	SB Cutoff Wall Installati	Worker Commute	4	9	1	22			
E	SB Cutoff Wall Installation								
E	Soil Borrow Extraction/	Scraper	10	12			14,335 CY per day	May 17 to	May 28
E	Soil Borrow Extraction/	Excavator	4	12					
E	Soil Borrow Extraction/	Dump Truck	84	12	0	0			
E	Soil Borrow Extraction/	Sheeps Foot Compactor	1	12					
E	Soil Borrow Extraction/	Bulldozer	2	12					
E	Soil Borrow Extraction/	Motor Grader	1	12					
E	Soil Borrow Extraction/	Water Truck	2	3					
E	Soil Borrow Extraction/	Worker Commute	20	12	1	22			
E	Soil Borrow Extraction/	Dust Emission	1.4	12					
E	Soil Borrow Extraction/Levee Placement								
E	Wet Well Excavation/In	Crane	1	2				May 30 to	May 31 to
E	Wet Well Excavation/In	Front End Loader	1	1					
E	Wet Well Excavation/In	Dump Truck	2	1	1	20			
E	Wet Well Excavation/In	Worker Commute	2	2	1	22			
E	Wet Well Excavation/Installation								
E	Rip Rap Installation	Crane	4	4				June 26 to	June 29
E	Rip Rap Installation	Bulldozer	2	4					
E	Rip Rap Installation	Hydraulic Excavator	2	4					
E	Rip Rap Installation	Towboat	5	4	1.5	180			
E	Rip Rap Installation	Worker Commute	13	0	0	0			
E	Rip Rap Installation								
E	Trench Excavation & Fo	Excavator	1	1			596 CY per day	June 3 to	June 7
E	Trench Excavation & Fo	Dump Truck	3	1	1	20			
E	Trench Excavation & Fo	Front End Loader	1	1					
E	Trench Excavation & Fo	Pipe Layer	1	5					
E	Trench Excavation & Fo	Worker Commute	3	5	1	22			
E	Trench Excavation & Fo	Dust Emission	0.1	5					
E	Trench Excavation & Forcemain Installation								
E	Utility Relocation	Utility/Pole Truck	3	18				May 11 to	May 28
E	Utility Relocation	Utility/Pole Truck	3	18					
E	Utility Relocation	Worker Commute	6	18	1	22			
E	Utility Relocation								
E	Drainage	Excavator	2	1				June 21 to	June 21
E	Drainage	Front End Loader	1	1					
E	Drainage	Dump Truck	3	1					
E	Drainage	Compressor	1	1					
E	Drainage	Worker Commute	4	1	1	22			
E	Drainage								
F	Building Demo	Bulldozer	2	20				May 1 to	May 20
F	Building Demo	Front End Loader	2	20					
F	Building Demo	Excavator	2	20					
F	Building Demo	Haul Truck	1	2	13	20			
F	Building Demo	Worker Commute	6	20	1	22			
F	Building Demo	Dust Emission	1.9	2					
F	Building Demo								

F	Roadway Removal	Cold Planer	1	1				May 1	
F	Roadway Removal	Scraper	1	1					
F	Roadway Removal	Dump Truck	1	1	17	20			
F	Roadway Removal	Bulldozer	1	1					
F	Roadway Removal	Excavator	1	1					
F	Roadway Removal	Worker Commute	4	1	1	22			
F	Roadway Removal								
F	Roadway Replace	Dump Truck	13	3	14	20		July 14 to	July 16
F	Roadway Replace	Vibratory Compactor	2	3					
F	Roadway Replace	Asphalt Paver	1	1					
F	Roadway Replace	Asphalt Compactor	1	3					
F	Roadway Replace	Motor Grader	2	3					
F	Roadway Replace	Bulldozer	2	3					
F	Roadway Replace	Worker Commute	8	3	1	22			
F	Roadway Replace								
F	Stripping	Wheel Tractor Scraper	3	19			4.75 Ac per day	May 21 to	June 13
F	Stripping	Bulldozer	1	24					
F	Stripping	Dump Truck	10	24	17	20			
F	Stripping	Excavator	1	24					
F	Stripping	Worker Commute	5	24	1	22			
F	Stripping	Dust Emission	4.7	24					
F	Stripping								
F	Soil Borrow Extraction/	Scraper	14	30			21,456 CY per day	June 14 to	July 13
F	Soil Borrow Extraction/	Excavator	6	30					
F	Soil Borrow Extraction/	Dump Truck	117	30	0	0			
F	Soil Borrow Extraction/	Sheeps Foot Compactor	1	30					
F	Soil Borrow Extraction/	Bulldozer	2	30					
F	Soil Borrow Extraction/	Motor Grader	1	30					
F	Soil Borrow Extraction/	Water Truck	2	5					
F	Soil Borrow Extraction/	Worker Commute	26	30	1	22			
F	Soil Borrow Extraction/	Dust Emission	2.1	30					
F	Soil Borrow Extraction/Levee Placement								
F	Rip Rap Installation	Crane	6	33				July 17 to	August 18
F	Rip Rap Installation	Bulldozer	3	33					
F	Rip Rap Installation	Hydraulic Excavator	3	33					
F	Rip Rap Installation	Towboat	1	33	1.5	180			
F	Rip Rap Installation	Worker Commute	13	33	1	22			
F	Rip Rap Installation								
F	Existing Pump Station R	Bulldozer	1	2				May 1 to	May 2
F	Existing Pump Station R	Front End Loader	1	2					
F	Existing Pump Station R	Excavator	1	2					
F	Existing Pump Station R	Haul Truck	1	2	1	20			
F	Existing Pump Station R	Worker Commute	3	2	1	22			
F	Existing Pump Station R	Dust Emission	0.1	2					
F	Existing Pump Station Removal								
F	Utility Relocation	Utility/Pole Truck	3	29				May 31 to	June 28
F	Utility Relocation	Utility/Pole Truck	3	29					
F	Utility Relocation	Worker Commute	6	29	1	22			
F	Utility Relocation								
F	Drainage	Excavator	3	2				November 12 to	November 14
F	Drainage	Front End Loader	1	2					
F	Drainage	Dump Truck	6	2					
F	Drainage	Compressor	1	3					
F	Drainage	Worker Commute	5	3	1	22			
F	Drainage								
G	Building Demo	Bulldozer	1	3				May 1 to	May 3
G	Building Demo	Front End Loader	1	3					
G	Building Demo	Excavator	1	3					
G	Building Demo	Haul Truck	1	1	1	20			

G	Building Demo	Worker Commute	3	3	1	22			
G	Building Demo	Dust Emission	0.1	1					
G	Building Demo								
G	Roadway Replace	Dump Truck	8	1	15	20		June 8	
G	Roadway Replace	Vibratory Compactor	1	1					
G	Roadway Replace	Asphalt Paver	0	0					
G	Roadway Replace	Asphalt Compactor	0	0					
G	Roadway Replace	Motor Grader	1	1					
G	Roadway Replace	Bulldozer	1	1					
G	Roadway Replace	Worker Commute	3	1	1	22			
G	Roadway Replace								
G	Stripping	Wheel Tractor Scraper	3	9			4.86 Ac per day	May 4 to	May 14
G	Stripping	Bulldozer	1	11					
G	Stripping	Dump Truck	11	11	17	20			
G	Stripping	Excavator	1	11					
G	Stripping	Worker Commute	5	11	1	22			
G	Stripping	Dust Emission	4.9	11					
G	Stripping								
G	SB Cutoff Wall Installati	Dump Truck	3	11	53	0.25		May 15 to	May 25
G	SB Cutoff Wall Installati	Bulldozer	1	11					
G	SB Cutoff Wall Installati	Long Reach Excavator	1	11					
G	SB Cutoff Wall Installati	Hydraulic Excavator	1	11					
G	SB Cutoff Wall Installati	Rough Terrain/Telehandler F	1	11					
G	SB Cutoff Wall Installati	Worker Commute	4	11	1	22			
G	SB Cutoff Wall Installation								
G	Soil Borrow Extraction/	Scraper	10	13			14,526 CY per day	May 26 to	June 7
G	Soil Borrow Extraction/	Excavator	4	13					
G	Soil Borrow Extraction/	Dump Truck	84	13	0	0			
G	Soil Borrow Extraction/	Sheeps Foot Compactor	1	13					
G	Soil Borrow Extraction/	Bulldozer	2	13					
G	Soil Borrow Extraction/	Motor Grader	1	13					
G	Soil Borrow Extraction/	Water Truck	2	3					
G	Soil Borrow Extraction/	Worker Commute	20	13	1	22			
G	Soil Borrow Extraction/	Dust Emission	1.5	13					
G	Soil Borrow Extraction/Levee Placement								
G	Utility Relocation	Utility/Pole Truck	3	13				May 6 to	May 18
G	Utility Relocation	Utility/Pole Truck	3	13					
G	Utility Relocation	Worker Commute	6	13	1	22			
G	Utility Relocation								
G	Drainage	Excavator	3	1				June 18 to	June 18
G	Drainage	Front End Loader	1	1					
G	Drainage	Dump Truck	6	1					
G	Drainage	Compressor	1	1					
G	Drainage	Worker Commute	5	1	1	22			
G	Drainage								
G	Rip Rap Installation	Crane	4	21				June 9 to	June 29
G	Rip Rap Installation	Bulldozer	2	21					
G	Rip Rap Installation	Hydraulic Excavator	2	21					
G	Rip Rap Installation	Towboat	1	21	1.5	180			
G	Rip Rap Installation	Worker Commute	9	21	1	22			
G									

Worker Commute	**20**	**109**	**1**	**22**

te Material Borrow Activities

Segment	Construction Phase	Equipment	Number of Equi	9 Hrs. Work Days	Daily Truck Trips per	Roundtrip Miles	Daily Earthwork Rate (Dust Emissions)	Projected Time Frame	
C	Off-Site Material Borro	Scraper	6	38			21,537 CY per day	June 3 to	July 10
C	Off-Site Material Borro	Excavator	6	38					

C	Off-Site Material Borrov	Dump Truck	117	38	8	6.6			
C	Off-Site Material Borrov	Sheeps Foot Compactor	0	38					
C	Off-Site Material Borrov	Bulldozer	6	38					
C	Off-Site Material Borrov	Motor Grader	0	38					
C	Off-Site Material Borrov	Water Truck	2	6					
C	Off-Site Material Borrov	Worker Commute	20	38	1	22			
C	Off-Site Material Borrov	Dust Emission	2.2	38					
C	Off-Site Material Borrow								
D	Off-Site Material Borrov	Scraper	6	8			14,539 CY per day	May 26	June 2
D	Off-Site Material Borrov	Excavator	6	8					
D	Off-Site Material Borrov	Dump Truck	84	8	8	6.6			
D	Off-Site Material Borrov	Sheeps Foot Compactor	0	8					
D	Off-Site Material Borrov	Bulldozer	6	8					
D	Off-Site Material Borrov	Motor Grader	0	8					
D	Off-Site Material Borrov	Water Truck	2	2					
D	Off-Site Material Borrov	Worker Commute	20	8	1	22			
D	Off-Site Material Borrov	Dust Emission	1.5	8					
D	Off-Site Material Borrow								
E	Off-Site Material Borrov	Scraper	6	12			14,335 CY per day	May 17 to	May 28
E	Off-Site Material Borrov	Excavator	6	12					
E	Off-Site Material Borrov	Dump Truck	84	12	8	6.6			
E	Off-Site Material Borrov	Sheeps Foot Compactor	0	12					
E	Off-Site Material Borrov	Bulldozer	6	12					
E	Off-Site Material Borrov	Motor Grader	0	12					
E	Off-Site Material Borrov	Water Truck	2	3					
E	Off-Site Material Borrov	Worker Commute	20	12	1	22			
E	Off-Site Material Borrov	Dust Emission	1.4	12					
E	Off-Site Material Borrow								
F	Off-Site Material Borrov	Scraper	6	30			21,456 CY per day	June 14 to	July 13
F	Off-Site Material Borrov	Excavator	6	30					
F	Off-Site Material Borrov	Dump Truck	117	30	8	6.6			
F	Off-Site Material Borrov	Sheeps Foot Compactor	0	30					
F	Off-Site Material Borrov	Bulldozer	6	30					
F	Off-Site Material Borrov	Motor Grader	0	30					
F	Off-Site Material Borrov	Water Truck	2	5					
F	Off-Site Material Borrov	Worker Commute	20	30	1	22			
F	Off-Site Material Borrov	Dust Emission	2.1	30					
F	Off-Site Material Borrow								
G	Off-Site Material Borrov	Scraper	6	13			14,526 CY per day	May 26 to	June 7
G	Off-Site Material Borrov	Excavator	6	13					
G	Off-Site Material Borrov	Dump Truck	84	13	8	6.6			
G	Off-Site Material Borrov	Sheeps Foot Compactor	0	13					
G	Off-Site Material Borrov	Bulldozer	6	13					
G	Off-Site Material Borrov	Motor Grader	0	13					
G	Off-Site Material Borrov	Water Truck	2	3					
G	Off-Site Material Borrov	Worker Commute	20	13	1	22			
G	Off-Site Material Borrov	Dust Emission	1.5	13					

SOUTHPORT SACRAMENTO RIVER EIP SITE
HIGH EMISSIONS ESTIMATE SUMMARY - (Unfavorable Scenario)

CMA #1 PHASE 2 Project Site Related Activities

S	Construction Phase	Equipment	#	Days	Truck Trips	RT Miles	Daily Earthwork Rate	Projected Time Frame	
	Building Demo	Bulldozer	1	21				May 1 to	May 21
		Front End Loader	1	21					
		Excavator	1	21					
		Haul Truck	1	1	8	20			
		Worker Commute	3	21	1	22			
		Dust Emission	1.1	1					
	Roadway Removal	Cold Planer	1	2				May 1 to	May 2
		Scraper	2	2					
		Dump Truck	5	2	17	20			
		Bulldozer	1	2					
		Excavator	1	2					
		Worker Commute	5	2	1	22			
	Roadway Replace	Dump Truck	14	4	15	20		June 25 to	June 30
		Vibratory Compactor	2	6					
		Asphalt Paver	1	2					
		Asphalt Compactor	1	6					
		Motor Grader	2	6					
		Bulldozer	2	6					
		Worker Commute	8	6	1	22			
	Stripping	Wheel Tractor Scraper	3	8			4.02 Ac per day	May 22 to	June 1
		Bulldozer	1	11					
		Dump Truck	10	11	17	20			
		Excavator	1	11					
		Worker Commute	5	11	1	22			
		Dust Emission	4.0	11					
A	SB Cutoff Wall Installation	Dump Truck	3	7	53	0.25		June 2 to	June 8
		Bulldozer	1	7					
		Long Reach Excavator	1	7					
		Hydraulic Excavator	1	7					
		Rough Terrain/Telehand	1	7					
		Worker Commute	4	7	1	22			
	Soil Borrow Extraction/Levee Placement	Scraper	10	16			13,493 CY per day	June 9 to	June 24
		Excavator	4	16					
		Dump Truck	84	16	0	0			
		Sheeps Foot Compactor	1	16					
		Bulldozer	2	16					
		Motor Grader	1	16					
		Water Truck	2	4					
		Worker Commute	20	16	1	22			
		Dust Emission	1.3	16					
		Crane	6	12					

	Rip Rap Installation	Bulldozer	3	12				July 1 to July 12
		Hydraulic Excavator	3	12				
		Towboat	1	12	1.5	180		
		Worker Commute	13	12	1	22		
	Utility Relocation	Utility/Pole Truck	4	18				May 26 to June 12
		Utility/Pole Truck	4	18				
		Worker Commute	8	18	1	22		
	Drainage	Excavator	3	2				October 6 to October 7
		Front end loader	1	2				
		Dump Truck	6	2				
		Compressor	1	2				
		Worker Commute	5	2	1	22		
	Building Demo	Bulldozer	6	31				May 1 to May 31
		Front End Loader	6	31				
		Excavator	6	31				
		Haul Truck	1	6	13	20		
		Worker Commute	18	31	1	22		
		Dust Emission	1.9	6				
	Roadway Removal	Cold Planer	1	1				May 1
		Scraper	1	1				
		Dump Truck	2	1	17	20		
		Bulldozer	1	1				
		Excavator	1	1				
		Worker Commute	4	1	1	22		
	Roadway Replace	Dump Truck	13	3	15	20		August 18 to August 21
		Vibratory Compactor	2	4				
		Asphalt Paver	1	1				
		Asphalt Compactor	1	4				
		Motor Grader	2	4				
		Bulldozer	2	4				
		Worker Commute	8	4	1	22		
	Stripping	Wheel Tractor Scraper	3	22			4.73 Ac per day	June 1 to June 28
		Bulldozer	1	28				
		Dump Truck	10	28	17	20		
		Excavator	1	28				
B		Worker Commute	5	28	1	22		
		Dust Emission	4.7	28				

	Soil Borrow Extraction/Levee Placement	Scraper	10	50			14,647 CY per day	June 29 to	August 17
		Excavator	4	50					
		Dump Truck	84	50	0	0			
		Sheeps Foot Compactor	1	50					
		Bulldozer	2	50					
		Motor Grader	1	50					
		Water Truck	2	10					
		Worker Commute	20	50	1	22			
		Dust Emission	1.5	50					
	Utility Relocation	Utility/Pole Truck	4	23				May 24 to	June 15
		Utility/Pole Truck	4	23					
		Worker Commute	8	50	1	22			
	Drainage	Excavator	3	2				August 26 to	August 29
		Front end loader	1	2					
		Dump Truck	6	2					
		Compressor	1	4					
		Worker Commute	5	4	1	22			
	Rip Rap Installation	Crane	6	46				August 22 to	October 6
		Bulldozer	3	46					
		Hydraulic Excavator	3	46					
		Towboat	1	46	1.5	180			
		Worker Commute	13	46	1	22			
		Worker Commute	**20**	**159**	**1**	**22**			

CMA #1 PHASE 2 Off-Site Material Borrow Activities									
S	**Construction Phase**	**Equipment**	**#**	**Days**	**Truck Trips**	**RT Miles**	**Daily Earthwork Rate**	**Projected Time Frame**	
A	Off-Site Material Borrow	Scraper	6	16			13,493 CY per day	June 9 to	June 24
		Excavator	6	16					
		Dump Truck	84	16	8	6.6			
		Sheeps Foot Compactor	0	16					
		Bulldozer	6	16					
		Motor Grader	0	16					
		Water Truck	2	4					
		Worker Commute	20	16	1	22			
		Dust Emission	1.3	16					
B	Off-Site Material Borrow	Scraper	6	50			14,647 CY per day	June 29 to	August 17
		Excavator	6	50					
		Dump Truck	84	50	8	6.6			
		Sheeps Foot Compactor	0	50					
		Bulldozer	6	50					
		Motor Grader	0	50					
		Water Truck	2	10					
		Worker Commute	20	50	1	22			
		Dust Emission	1.5	50					

SOUTHPORT SACRAMENTO RIVER EIP SITE
HIGH EMISSIONS ESTIMATE SUMMARY - (Unfavorable Scenario)
(Sequential Borrow Restoration)
CMA #2 PHASE 1 Project Site Related Activities

S	Construction Phase	Equipment	#	Days	Truck Trips	RT Miles	Projected Time Frame	
C	Building Demo	Bulldozer	1	7			May 1 to	May 9
		Front End Loader	1	7				
		Excavator	1	7				
		Haul Truck	1	1	3	20		
		Worker Commute	3	7	1	22		
		Dust Emission	0.4	1				
	Roadway Removal	Cold Planer	1	1			May 1	
		Scraper	2	1				
		Dump Truck	7	1	15	20		
		Bulldozer	1	1				
		Excavator	1	1				
		Worker Commute	5	1	1	22		
	Roadway Replace	Dump Truck	12	2	15	20	October 5 to	October 6
		Vibratory Compactor	1	2				
		Asphalt Paver	1	1				
		Asphalt Compactor	1	2				
		Motor Grader	1	2				
		Bulldozer	1	2				
		Worker Commute	5	2	1	22		
	Stripping	Wheel Tractor Scraper	3	21			June 1 to	June 27
		Bulldozer	1	27				
		Dump Truck	10	27	17	20		
		Excavator	1	27				
		Worker Commute	5	27	1	22		
		Dust Emission	4.8	27				
	Levee Degrade	Scraper	6	29			June 28 to	August 3
		Bulldozer	1	37				
		Dump Truck	10	36	17	20		
		Excavator	1	37				
		Worker Commute	8	37	1	22		
		Dust Emission	0.4	37				
	Soil Borrow Extraction/Levee Placement	Scraper	10	60			August 4 to	October 3
		Excavator	4	60				
		Dump Truck	84	60	0	0		
		Sheeps Foot Compactor	1	61				
		Bulldozer	2	60				
		Motor Grader	1	61				
		Water Truck	2	13				
		Worker Commute	20	61	1	22		
		Dust Emission	1.5	61				
	Rip Rap Installation	Crane	4	44			October 7 to	November 19
		Bulldozer	2	44				
		Hydraulic Excavator	2	44				
		Towboat	1	44	1.5	180		
		Worker Commute	9	44	1	22		
	Planting	Worker Commute	10	27	1	22	October 1	October 27
		Pickup	1	27	1	10		
		OffRoad Truck	2	27	1	10		
	Irrigation	Trencher	1	15	0	0	October 1	October 15
		Worker Commute	5	15	1	22		
		Pickup	1	15	1	10		
		Drill Rig	1	1	0	0		

	Utility Relocation	Utility/Pole Truck	4	22			May 10 to	May 31
		Utility/Pole Truck	4	22				
		Worker Commute	8	22	1	22		
	Drainage	Excavator	2	1			October 4 to	October 4
		Front End Loader	1	1				
		Dump Truck	3	1				
		Compressor	1	1				
		Worker Commute	4	1	1	22		
	Building Demo	Bulldozer	1	17			May 1 to	May 17
		Front End Loader	1	17				
		Excavator	1	17				
		Haul Truck	1	1	7	20		
		Worker Commute	3	17	1	22		
		Dust Emission	1.0	1				
	Roadway Removal	Cold Planer	1	1			May 1	
		Scraper	1	1				
		Dump Truck	3	1	15	20		
		Bulldozer	1	1				
		Excavator	1	1				
		Worker Commute	4	1	1	22		
	Roadway Replace	Dump Truck	11	2	14	20	July 9 to	July 10
		Vibratory Compactor	1	2				
		Asphalt Paver	1	1				
		Asphalt Compactor	1	2				
		Motor Grader	1	2				
		Bulldozer	1	2				
		Worker Commute	5	2	1	22		
	Stripping	Wheel Tractor Scraper	3	9			May 29 to	June 8
		Bulldozer	1	11				
		Dump Truck	10	11	17	20		
		Excavator	1	11				
		Worker Commute	5	11	1	22		
		Dust Emission	4.5	11				
D	SB Cutoff Wall Installation	Dump Truck	3	7	53	0.25	June 9 to	June 15
		Bulldozer	1	7				
		Long Reach Excavator	1	7				
		Hydraulic Excavator	1	7				
		Rough Terrain/Telehandler Forklift	1	7				
		Worker Commute	4	7	1	22		
	Soil Borrow Extraction/Levee Placement	Scraper	10	15			June 16 to	June 30
		Excavator	4	15				
		Dump Truck	84	15	0	0		
		Sheeps Foot Compactor	1	15				
		Bulldozer	2	15				
		Motor Grader	1	15				
		Water Truck	2	3				
		Worker Commute	20	15	1	22		
		Dust Emission	1.4	15				

	Rip Rap Installation	Crane	4	1			July 11 to	July 11
		Bulldozer	2	1				
		Hydraulic Excavator	2	1				
		Towboat	1	1	1.5	180		
		Worker Commute	9	1	1	22		
	Utility Relocation	Utility/Pole Truck	3	11			May 18 to	May 28
		Utility/Pole Truck	3	11				
		Worker Commute	6	11	1	22		
	Drainage	Excavator	3	3			July 1 to	July 8
		Front End Loader	1	3				
		Dump Truck	6	3				
		Compressor	1	8				
		Worker Commute	5	8	1	22		
E	Roadway Replace	Dump Truck	15	3	14	20	July 3 to	July 6
		Vibratory Compactor	2	4				
		Asphalt Paver	1	1				
		Asphalt Compactor	1	4				
		Motor Grader	2	4				
		Bulldozer	2	4				
		Worker Commute	8	4	1	22		
	Stripping	Wheel Tractor Scraper	3	8			May 1 to	May 10
		Bulldozer	1	10				
		Dump Truck	10	10	17	20		
		Excavator	1	10				
		Worker Commute	5	10	1	22		
		Dust Emission	4.4	10				
	SB Cutoff Wall Installation	Dump Truck	3	11	53	0.25	May 29 to	June 8
		Bulldozer	1	11				
		Long Reach Excavator	1	11				
		Hydraulic Excavator	1	11				
		Rough Terrain/Telehandler Forklift	1	11				
		Worker Commute	4	11	1	22		
	Soil Borrow Extraction/Levee Placement	Scraper	10	23			June 9 to	July 1
		Excavator	9	23				
		Dump Truck	95	23	0	0		
		Sheeps Foot Compactor	1	23				
		Bulldozer	2	23				
		Motor Grader	1	23				
		Water Truck	2	5				
		Worker Commute	25	23	1	22		
		Dust Emission	1.5	23				
	Rip Rap Installation	Crane	4	4			July 7 to	July 10
		Bulldozer	2	4				
		Hydraulic Excavator	2	4				
		Towboat	5	4	1.5	180		
		Worker Commute	13	4	1	22		
	Utility Relocation	Utility/Pole Truck	3	18			May 11 to	May 28
		Utility/Pole Truck	3	18				
		Worker Commute	6	18	1	22		
	Drainage	Excavator	2	1			July 2 to	July 2
		Front End Loader	1	1				
		Dump Truck	3	1				
		Compressor	1	1				
		Worker Commute	4	1	1	22		
		Bulldozer	2	30				

	Building Demo	Front End Loader	2	30			May 1 to	May 30
		Excavator	2	30				
		Haul Truck	1	2	13	20		
		Worker Commute	6	30	1	22		
		Dust Emission	1.9	2				
	Roadway Removal	Cold Planer	1	1			May 1	
		Scraper	2	1				
		Dump Truck	7	1	15	20		
		Bulldozer	1	1				
		Excavator	1	1				
		Worker Commute	5	1	1	22		
	Roadway Replace	Dump Truck	16	3	14	20	November 15 to	November 19
		Vibratory Compactor	2	5				
		Asphalt Paver	1	1				
		Asphalt Compactor	1	5				
		Motor Grader	2	5				
		Bulldozer	2	5				
		Worker Commute	8	5	1	22		
	Stripping	Wheel Tractor Scraper	3	23			June 29 to	July 27
		Bulldozer	1	29				
		Dump Truck	10	29	17	20		
		Excavator	1	29				
		Worker Commute	5	29	1	22		
		Dust Emission	4.8	29				
	Levee Degrade	Scraper	6	36			July 28 to	September 10
		Bulldozer	1	45				
		Dump Truck	10	45	17	20		
		Excavator	1	45				
		Worker Commute	8	45	1	22		
F		Dust Emission	0.4	45				
	Soil Borrow Extraction/Levee Placement	Scraper	10	62			September 11 to	November 11
		Excavator	4	62				
		Dump Truck	84	62	0	0		
		Sheeps Foot Compactor	1	62				
		Bulldozer	2	62				
		Motor Grader	1	62				
		Water Truck	2	13				
		Worker Commute	20	62	1	22		
		Dust Emission	1.5	62				
	Rip Rap Installation	Crane	4	58			November 20 to	January 16
		Bulldozer	2	58				
		Hydraulic Excavator	2	58				
		Towboat	1	58	1.5	180		
		Worker Commute	9	58	1	22		

	Existing Pump Station Removal	Bulldozer	1	2			May 1 to	May 2
		Front End Loader	1	2				
		Excavator	1	2				
		Haul Truck	1	2	1	20		
		Worker Commute	3	2	1	22		
		Dust Emission	0.1	2				
	Utility Relocation	Utility/Pole Truck	3	29			May 31 to	June 28
		Utility/Pole Truck	3	29				
		Worker Commute	6	29	1	22		
	Drainage	Excavator	3	2			November 12 to	November 14
		Front End Loader	1	2				
		Dump Truck	6	2				
		Compressor	1	3				
		Worker Commute	5	3	1	22		
G	Building Demo	Bulldozer	1	5			May 1 to	May 5
		Front End Loader	1	5				
		Excavator	1	5				
		Haul Truck	1	1	1	20		
		Worker Commute	3	5	1	22		
		Dust Emission	0.1	1				
	Roadway Replace	Dump Truck	8	1	14	20	June 21	
		Vibratory Compactor	1	1				
		Asphalt Paver	0	0				
		Asphalt Compactor	0	0				
		Motor Grader	1	1				
		Bulldozer	1	1				
		Worker Commute	3	1	1	22		
	Stripping	Wheel Tractor Scraper	3	8			May 19 to	May 28
		Bulldozer	1	10				
		Dump Truck	10	10	17	20		
		Excavator	1	10				
		Worker Commute	5	10	1	22		
		Dust Emission	4.4	10				
	SB Cutoff Wall Installation	Dump Truck	3	12	53	0.25	May 29 to	June 9
		Bulldozer	1	12				
		Long Reach Excavator	1	12				
		Hydraulic Excavator	1	12				
		Rough Terrain/Telehandler Forklift	1	12				
		Worker Commute	4	12	1	22		
	Soil Borrow Extraction/Levee Placement	Scraper	10	10			June 10 to	June 19
		Excavator	9	10				
		Dump Truck	95	10	0	0		
		Sheeps Foot Compactor	1	10				
		Bulldozer	2	10				
		Motor Grader	1	10				
		Water Truck	2	2				
		Worker Commute	25	10	1	22		
		Dust Emission	1.4	10				
	Utility Relocation	Utility/Pole Truck	3	13			May 6 to	May 18
		Utility/Pole Truck	3	13				
		Worker Commute	6	13	1	22		
	Drainage	Excavator	3	1			June 20 to	June 20
		Front End Loader	1	1				
		Dump Truck	6	1				
		Compressor	1	1				
		Worker Commute	5	1	1	22		
	Rip Rap Installation	Crane	4	20			June 22 to	July 11
		Bulldozer	2	20				
		Hydraulic Excavator	2	20				
		Towboat	1	20	1.5	180		

		Worker Commute	9	20	1	22	

Worker Commute	**20**	**244**	**1**	**22**

CMA #2 PHASE 1 Off-Site Material Borrow Activities							
S	**Construction Phase**	**Equipment**	**#**	**Days**	**Truck Trips**	**RT Miles**	**Projected Time Frame**
C	Off-Site Material Borrow	Scraper	14	14			August 4 to October 3
		Excavator	6	14			
		Dump Truck	84	14	8	6.6	
		Sheeps Foot Compactor	1	14			
		Bulldozer	2	14			
		Motor Grader	1	14			
		Water Truck	2	2			
		Worker Commute	26	14	1	22	
		Dust Emission	2.2	14			
D	Off-Site Material Borrow	Scraper	14	14			June 16 to June 30
		Excavator	6	14			
		Dump Truck	84	14	8	6.6	
		Sheeps Foot Compactor	1	14			
		Bulldozer	2	14			
		Motor Grader	1	14			
		Water Truck	2	2			
		Worker Commute	26	14	1	22	
		Dust Emission	2.2	14			
E	Off-Site Material Borrow	Scraper	14	14			June 9 to July 1
		Excavator	6	14			
		Dump Truck	95	14	7	6.6	
		Sheeps Foot Compactor	1	14			
		Bulldozer	2	14			
		Motor Grader	1	14			
		Water Truck	2	2			
		Worker Commute	26	14	1	22	
		Dust Emission	2.2	14			
F	Off-Site Material Borrow	Scraper	14	14			September 11 to November 11
		Excavator	6	14			
		Dump Truck	84	14	8	6.6	
		Sheeps Foot Compactor	1	14			
		Bulldozer	2	14			
		Motor Grader	1	14			
		Water Truck	2	2			
		Worker Commute	26	14	1	22	
		Dust Emission	2.2	14			
G	Off-Site Material Borrow	Scraper	14	14			June 10 to June 19
		Excavator	6	14			
		Dump Truck	95	14	7	6.6	
		Sheeps Foot Compactor	1	14			
		Bulldozer	2	14			
		Motor Grader	1	14			
		Water Truck	2	2			
		Worker Commute	26	14	1	22	
		Dust Emission	2.2	14			

SOUTHPORT SACRAMENTO RIVER EIP SITE
HIGH EMISSIONS ESTIMATE SUMMARY - (Unfavorable Scenario)
(Sequential Borrow Restoration)
CMA #2 PHASE 2 Project Site Related Activities

S	Construction Phase	Equipment	#	Days	Truck Trips	RT Miles	Daily Earthwork Rate	Projected Time Frame	
	Building Demo	Bulldozer	2	25				May 1 to	May 25
		Front End Loader	2	25					
		Excavator	2	25					
		Haul Truck	1	4	13	20			
		Worker Commute	6	25	1	22			
		Dust Emission	1.9	4					
	Roadway Removal	Cold Planer	1	2				May 1 to	September 20
		Scraper	2	2					
		Dump Truck	5	2	15	20			
		Bulldozer	1	2					
		Excavator	1	1					
		Worker Commute	5	2	1	22			
	Roadway Replace	Dump Truck	9	2	15	20		October 8 to	October 10
		Vibratory Compactor	1	3					
		Asphalt Paver	1	2					
		Asphalt Compactor	1	3					
		Motor Grader	1	3					
		Bulldozer	1	3					
		Worker Commute	5	3	1	22			
	Stripping	Wheel Tractor Scraper	3	13			4.47 Ac per day	June 13 to	June 29
		Bulldozer	1	17					
		Dump Truck	10	17	17	20			
		Excavator	1	17					
		Worker Commute	5	17	1	22			
		Dust Emission	4.5	17					
	Levee Degrade	Scraper	6	54			3,682 CY per day	June 30 to	September 7
		Bulldozer	1	70					
		Dump Truck	10	70	17	20			
		Excavator	1	70					
		Worker Commute	8	70	1	22			
A		Dust Emission	0.4	70					
	SB Cutoff Wall Installation	Dump Truck	3	9	53	0.25		September 8 to	September 16
		Bulldozer	1	9					
		Long Reach Excavator	1	9					
		Hydraulic Excavator	1	9					
		Rough Terrain/Telehandle	1	9					
		Worker Commute	4	9	1	22			
	Soil Borrow Extraction/Leve e Placement	Scraper	10	19			14,024 CY per day	September 17 to	October 5
		Excavator	4	19					
		Dump Truck	84	19	0	0			
		Sheeps Foot Compactor	1	19					
		Bulldozer	2	19					
		Motor Grader	1	19					

	Water Truck	2	4				
	Worker Commute	20	19	1	22		
	Dust Emission	1.4	19				
Rip Rap Installation	Crane	8	21				October 11 to October 31
	Bulldozer	4	21				
	Hydraulic Excavator	4	21				
	Towboat	1	21	1.5	180		
	Worker Commute	17	21	1	22		
Utility Relocation	Utility/Pole Truck	4	18				May 26 to June 12
	Utility/Pole Truck	4	18				
	Worker Commute	8	21	1	22		
Drainage	Excavator	3	2				October 6 to October 7
	Front end loader	1	2				
	Dump Truck	6	2				
	Compressor	1	2				
	Worker Commute	5	2	1	22		
Building Demo	Bulldozer	3	23				May 1 to May 23
	Front End Loader	3	23				
	Excavator	3	23				
	Haul Truck	1	7	13	20		
	Worker Commute	9	23	1	22		
	Dust Emission	1.9	7				
Roadway Removal	Cold Planer	1	1				May 1
	Scraper	2	1				
	Dump Truck	6	1	17	20		
	Bulldozer	1	1				
	Excavator	1	1				
	Worker Commute	5	1	1	22		
Roadway Replace	Dump Truck	18	3	15	20		August 29 to September 3
	Vibratory Compactor	2	6				
	Asphalt Paver	1	1				
	Asphalt Compactor	1	6				
	Motor Grader	1	3				
	Bulldozer	1	3				
	Worker Commute	6	6	1	22		
Stripping	Wheel Tractor Scraper	3	24			4.74 Ac per day	June 16 to July 16
	Bulldozer	1	31				
	Dump Truck	10	31	17	20		
	Excavator	1	31				
	Worker Commute	5	31	1	22		
	Dust Emission	4.7	31				

	Levee Degrade	Scraper	6	31			3,873 CY per day	July 17 to August 24
		Bulldozer	1	39				
		Dump Truck	10	38	17	20		
		Excavator	1	39				
		Worker Commute	8	39	1	22		
		Dust Emission	0.4	39				
	SB Cutoff Wall Installation	Dump Truck	3	1	53	0.25		September 4 to September 4
		Bulldozer	1	1				
		Long Reach Excavator	1	1				
		Hydraulic Excavator	1	1				
		Rough Terrain/Telehandle	1	1				
		Worker Commute	4	1	1	22		
B	Soil Borrow Extraction/Levee Placement	Scraper	10	67			14,956 CY per day	September 5 to November 10
		Excavator	9	67				
		Dump Truck	95	67	0	0		
		Sheeps Foot Compactor	1	67				
		Bulldozer	2	67				
		Motor Grader	1	67				
		Water Truck	2	14				
		Worker Commute	25	67	1	22		
		Dust Emission	1.5	67				
	Rip Rap Installation	Crane	6	38				November 11 to December 18
		Bulldozer	3	38				
		Hydraulic Excavator	3	38				
		Towboat	1	38	1.5	180		
		Worker Commute	13	38	1	22		
	On-Site Material Borrow Restoration	Scraper	0	0			21,518 CY per day	October 9 to October 20
		Excavator	0	0				
		Dump Truck	0	0	0	0		
		Sheeps Foot Compactor	0	0				
		Bulldozer	0	0				
		Motor Grader	0	0				
		Water Truck	0	0				
		Worker Commute	0	0	0	0		
		Dust Emission	0.0	0				
	Off-Site Material Borrow Restoration	Scraper	0	0			22,186 CY per day	October 9 to November 1
		Excavator	0	0				
		Dump Truck	0	0	0	0		
		Sheeps Foot Compactor	0	0				
		Bulldozer	0	0				
		Motor Grader	0	0				
		Water Truck	0	0				
		Worker Commute	0	0	0	0		
	Utility Relocation	Utility/Pole Truck	4	23				May 24 to June 15
		Utility/Pole Truck	4	23				
		Worker Commute	8	23	1	22		
	Drainage	Excavator	3	2				August 25 to August 28
		Front end loader	1	2				
		Dump Truck	6	2				
		Compressor	1	4				
		Worker Commute	5	4	1	22		

	Planting	Worker Commute	10	3	1	22		October 1 to October 3
		Pickup	1	3	1	10		
		OffRoad Truck	2	3	1	10		
	Irrigation	Trencher	1	4	0	0		October 2 to October 5
		Worker Commute	5	4	1	22		
		Pickup	1	4	1	10		

Worker Commute	**20**	**231**	**1**	**22**

CMA #2 PHASE 2 Off-Site Material Borrow Activities

S	Construction Phase	Equipment	#	Days	Truck Trips	RT Miles	Daily Earthwork Rate	Projected Time Frame
A	Off-Site Material Borrow	Scraper	14	24			22,186 CY per day	September 17 to October 5
		Excavator	6	24				
		Dump Truck	84	24	8	6.6		
		Sheeps Foot Compactor	1	24				
		Bulldozer	2	24				
		Motor Grader	1	24				
		Water Truck	2	4				
		Worker Commute	26	24	1	22		
		Dust Emission	2.2	24				
B	Off-Site Material Borrow	Scraper	14	24			22,186 CY per day	September 5 to November 10
		Excavator	6	24				
		Dump Truck	95	24	7	6.6		
		Sheeps Foot Compactor	1	24				
		Bulldozer	2	24				
		Motor Grader	1	24				
		Water Truck	2	4				
		Worker Commute	26	24	1	22		
		Dust Emission	2.2	24				

SOUTHPORT SACRAMENTO RIVER EIP SITE
HIGH EMISSIONS ESTIMATE SUMMARY - (Unfavorable Scenario)

CMA #3 PHASE 1 Project Site Related Activities

S	Construction Phase	Equipment	#	Days	Truck Trips	RT Miles	Projected Time Frame
C	Roadway Removal	Cold Planer	1	1			May 1
		Scraper	2	1			
		Dump Truck	6	1	17	20	
		Bulldozer	1	1			
		Excavator	1	1			
		Worker Commute	5	1	1	22	
	Roadway Replace	Dump Truck	14	1	17	20	June 29
		Vibratory Compactor	1	1			
		Asphalt Paver	1	1			
		Asphalt Compactor	1	1			
		Motor Grader	1	1			
		Bulldozer	1	1			
		Worker Commute	5	1	1	22	
	Stripping	Wheel Tractor Scraper	3	13			May 2 to May 19
		Bulldozer	1	18			
		Dump Truck	10	18	17	20	
		Excavator	1	18			
		Worker Commute	5	18	1	22	
		Dust Emission	4.4	18			
	Soil Borrow Extraction/Levee Placement	Scraper	10	40			May 20 to June 28
		Excavator	4	40			
		Dump Truck	84	40	0	0	
		Sheeps Foot Compactor	1	40			
		Bulldozer	2	40			
		Motor Grader	1	40			
		Water Truck	2	8			
		Worker Commute	20	40	1	22	
		Dust Emission	1.4	40			
	Rip Rap Installation	Crane	6	87	10	20	June 30 to September 24
		Bulldozer	3	87			
		Hydraulic Excavator	3	87			
		Towboat	1	87	1.5	180	
		Worker Commute	13	87	1	22	
	Utility Relocation	Utility/Pole Truck	4	22			May 10 to May 31
		Utility/Pole Truck	4	22			
		Worker Commute	8	22	1	22	
	Drainage	Excavator	2	1			October 4 to October 4
		Front End Loader	1	1			
		Dump Truck	3	1			
		Compressor	1	1			
		Worker Commute	4	1	1	22	
	Building Demo	Bulldozer	1	5			May 1 to May 5
		Front End Loader	1	5			
		Excavator	1	5			
		Haul Truck	1	1	2	20	
		Worker Commute	3	5	1	22	
		Dust Emission	0.3	1			
	Roadway	Cold Planer	1	1			
		Scraper	1	1			

	Roadway Removal	Dump Truck	3	1	17	20	May 1	
		Bulldozer	1	1				
		Excavator	1	1				
		Worker Commute	4	1	1	22		
	Roadway Replace	Dump Truck	16	2	17	20	June 12 to	June 13
		Vibratory Compactor	1	2				
		Asphalt Paver	1	1				
		Asphalt Compactor	1	2				
		Motor Grader	1	2				
		Bulldozer	1	2				
		Worker Commute	5	2	1	22		
	Stripping	Wheel Tractor Scraper	3	4			May 6 to	May 9
		Bulldozer	1	4				
		Dump Truck	10	4	17	20		
		Excavator	1	4				
		Worker Commute	5	4	1	22		
		Dust Emission	4.8	4				
	Levee Degrade	Scraper	17	6			May 10 to	May 31
		Bulldozer	1	22				
		Dump Truck	10	22	17	20		
		Excavator	1	22				
		Worker Commute	19	22	1	22		
D		Dust Emission	0.4	22				
	SB Cutoff Wall Installation	Dump Truck	3	2	53	0.25	June 1 to	June 2
		Bulldozer	1	2				
		Long Reach Excavator	1	2				
		Hydraulic Excavator	1	2				
		Rough Terrain/Telehandle	1	2				
		Worker Commute	4	2	1	22		
	Soil Borrow Extraction/Levee Placement	Scraper	10	9			June 3 to	June 11
		Excavator	4	9				
		Dump Truck	84	9	0	0		
		Sheeps Foot Compactor	1	9				
		Bulldozer	2	9				
		Motor Grader	1	9				
		Water Truck	2	2				
		Worker Commute	20	9	1	22		
		Dust Emission	1.4	9				
	Rip Rap Installation	Crane	2	62			June 14 to	August 14
		Bulldozer	1	62				
		Hydraulic Excavator	1	62				
		Towboat	1	62	1.5	180		
		Worker Commute	5	62	1	22		
	Utility Relocation	Utility/Pole Truck	3	11			May 18 to	May 28
		Utility/Pole Truck	3	11				
		Worker Commute	6	11	1	22		
	Drainage	Excavator	3	3			July 1 to	July 8
		Front End Loader	1	3				
		Dump Truck	6	3				
		Compressor	1	8				
		Worker Commute	5	8	1	22		
	Roadway	Dump Truck	17	2	17	20		
		Vibratory Compactor	2	2				
		Asphalt Paver	1	1				

	Replace	Asphalt Compactor	1	2			July 4 to	July 5
		Motor Grader	2	2				
		Bulldozer	2	2				
		Worker Commute	8	2	1	22		

	Stripping	Wheel Tractor Scraper	3	4			
		Bulldozer	1	6			
		Dump Truck	10	6	17	20	May 1 to May 6
		Excavator	1	6			
		Worker Commute	5	6	1	22	
		Dust Emission	4.1	6			
	Levee Degrade	Scraper	17	10			
		Bulldozer	1	35			
		Dump Truck	10	35	17	20	May 7 to June 10
		Excavator	1	35			
		Worker Commute	19	35	1	22	
		Dust Emission	0.4	35			
	SB Cutoff Wall Installation	Dump Truck	3	9	53	0.25	
		Bulldozer	1	9			
		Long Reach Excavator	1	9			June 11 to June 19
		Hydraulic Excavator	1	9			
		Rough Terrain/Telehandle	1	9			
		Worker Commute	4	9	1	22	
	Soil Borrow Extraction/Levee Placement	Scraper	10	14			
		Excavator	4	14			
		Dump Truck	84	14	0	0	
		Sheeps Foot Compactor	1	14			
		Bulldozer	2	14			June 20 to July 3
		Motor Grader	1	14			
		Water Truck	2	3			
E		Worker Commute	20	14	1	22	
		Dust Emission	1.4	14			
	Rip Rap Installation	Crane	4	4			
		Bulldozer	2	4			
		Hydraulic Excavator	2	4			July 10 to September 7
		Towboat	5	4	1.5	180	
		Worker Commute	0	0	0	0	
	Wet Well Excavation/Installation	Crane	1	2			
		Front End Loader	1	1			July 6 to July 7
		Dump Truck	2	1	1	20	
		Worker Commute	2	2	1	22	
	Pump Station Installation	Crane	0	0			
		Front End Loader	0	0			July 8 to July 9
		Concrete Truck	0	0	0	0	
		Worker Commute	0	0	0	0	
	Trench Excavation & Forcemain Installation	Excavator	1	1			
		Dump Truck	3	1	1	20	
		Front End Loader	1	1			July 10 to July 14
		Pipe Layer	1	5			
		Worker Commute	3	5	1	22	
		Dust Emission	0.1	5			
	Utility Relocation	Utility/Pole Truck	3	18			
		Utility/Pole Truck	3	18			May 11 to May 28
		Worker Commute	6	18	1	22	
	Drainage	Excavator	2	1			
		Front End Loader	1	1			
		Dump Truck	3	1			July 2 to July 2
		Compressor	1	1			

		Worker Commute	4	1	1	22		
F	Building Demo	Bulldozer	2	18			May 1 to	May 18
		Front End Loader	2	18				
		Excavator	2	18				
		Haul Truck	1	2	13	20		
		Worker Commute	6	18	1	22		
		Dust Emission	1.9	2				
	Roadway Removal	Cold Planer	1	1			May 1	
		Scraper	2	1				
		Dump Truck	6	1	17	20		
		Bulldozer	1	1				
		Excavator	1	1				
		Worker Commute	5	1	1	22		
	Roadway Replace	Dump Truck	17	2	17	20	June 29 to	June 30
		Vibratory Compactor	2	2				
		Asphalt Paver	1	1				
		Asphalt Compactor	1	2				
		Motor Grader	2	2				
		Bulldozer	2	2				
		Worker Commute	8	2	1	22		
	Stripping	Wheel Tractor Scraper	3	4			May 19 to	May 23
		Bulldozer	1	5				
		Dump Truck	10	5	17	20		
		Excavator	1	5				
		Worker Commute	5	5	1	22		
		Dust Emission	4.2	5				
	Soil Borrow Extraction/Levee Placement	Scraper	10	36			May 24 to	June 28
		Excavator	4	36				
		Dump Truck	84	36	0	0		
		Sheeps Foot Compactor	1	36				
		Bulldozer	2	36				
		Motor Grader	1	36				
		Water Truck	2	8				
		Worker Commute	20	36	1	22		
		Dust Emission	1.5	36				
	Rip Rap Installation	Crane	6	74			July 1 to	September 12
		Bulldozer	3	74				
		Hydraulic Excavator	3	74				
		Towboat	1	74	1.5	180		
		Worker Commute	13	74	1	22		
	Existing Pump Station Removal	Bulldozer	1	2			May 1 to	May 2
		Front End Loader	1	2				
		Excavator	1	2				
		Haul Truck	1	2	1	20		
		Worker Commute	3	2	1	22		
		Dust Emission	0.1	2				
	Utility Relocation	Utility/Pole Truck	3	29			May 31 to	June 28
		Utility/Pole Truck	3	29				
		Worker Commute	6	29	1	22		
	Drainage	Excavator	3	2			November 12 to	November 14
		Front End Loader	1	2				
		Dump Truck	6	2				
		Compressor	1	3				
		Worker Commute	5	3	1	22		

	Building Demo	Bulldozer	1	5			May 1 to	May 5
		Front End Loader	1	5				
		Excavator	1	5				
		Haul Truck	1	1	1	20		
		Worker Commute	3	5	1	22		
		Dust Emission	0.1	1				
	Roadway Replace	Dump Truck	12	1	17	20	June 24	
		Vibratory Compactor	1	1				
		Asphalt Paver	1	1				
		Asphalt Compactor	1	1				
		Motor Grader	1	1				
		Bulldozer	1	1				
		Worker Commute	5	1	1	22		
	Stripping	Wheel Tractor Scraper	3	4			May 6 to	May 10
		Bulldozer	1	5				
		Dump Truck	10	5	17	20		
		Excavator	1	5				
		Worker Commute	5	5	1	22		
		Dust Emission	4.2	5				
	Levee Degrade	Scraper	17	7			May 11 to	June 4
		Bulldozer	1	25				
		Dump Truck	10	25	17	20		
		Excavator	1	25				
		Worker Commute	19	25	1	22		
		Dust Emission	0.4	25				
G	SB Cutoff Wall Installation	Dump Truck	3	9	53	0.25	June 5 to	June 13
		Bulldozer	1	9				
		Long Reach Excavator	1	9				
		Hydraulic Excavator	1	9				
		Rough Terrain/Telehandle	1	9				
		Worker Commute	4	9	1	22		
	Soil Borrow Extraction/Levee Placement	Scraper	10	10			June 14 to	June 23
		Excavator	4	10				
		Dump Truck	84	10	0	0		
		Sheeps Foot Compactor	1	10				
		Bulldozer	2	10				
		Motor Grader	1	10				
		Water Truck	2	2				
		Worker Commute	20	10	1	22		
		Dust Emission	1.5	10				
	Utility Relocation	Utility/Pole Truck	3	13			May 6 to	May 18
		Utility/Pole Truck	3	13				
		Worker Commute	6	13	1	22		
	Drainage	Excavator	3	1			June 20 to	June 20
		Front End Loader	1	1				
		Dump Truck	6	1				
		Compressor	1	1				
		Worker Commute	5	1	1	22		
	Rip Rap Installation	Crane	4	43			June 25 to	August 6
		Bulldozer	2	43				
		Hydraulic Excavator	2	43				
		Towboat	1	43	1.5	180		
		Worker Commute	9	43	1	22		

Worker Commute	**20**	**146**	**1**	**22**

CMA #3 PHASE 1 Off-Site Material Borrow Activities

CMA #3 PHASE 1 Off-Site Material Borrow Activities

S	Construction Phase	Equipment	#	Days	Truck Trips	RT Miles	Projected Time Frame
C	Off-Site Material Borrow	Scraper	6	40			May 20 to June 28
		Excavator	6	40			
		Dump Truck	84	40	8	6.6	
		Sheeps Foot Compactor	0	40			
		Bulldozer	6	40			
		Motor Grader	0	40			
		Water Truck	2	8			
		Worker Commute	20	40	1	22	
		Dust Emission	1.4	40			
D	Off-Site Material Borrow	Scraper	6	9			June 3 to June 11
		Excavator	6	9			
		Dump Truck	84	9	8	6.6	
		Sheeps Foot Compactor	0	9			
		Bulldozer	6	9			
		Motor Grader	0	9			
		Water Truck	2	2			
		Worker Commute	20	9	1	22	
		Dust Emission	1.4	9			
E	Off-Site Material Borrow	Scraper	6	14			June 20 to July 3
		Excavator	6	14			
		Dump Truck	84	14	8	6.6	
		Sheeps Foot Compactor	0	14			
		Bulldozer	6	14			
		Motor Grader	0	14			
		Water Truck	2	3			
		Worker Commute	20	14	1	22	
		Dust Emission	1.4	14			
F	Off-Site Material Borrow	Scraper	6	36			May 24 to June 28
		Excavator	6	36			
		Dump Truck	84	36	8	6.6	
		Sheeps Foot Compactor	0	36			
		Bulldozer	6	36			
		Motor Grader	0	36			
		Water Truck	2	8			
		Worker Commute	20	36	1	22	
		Dust Emission	1.5	36			
G	Off-Site Material Borrow	Scraper	6	10			June 14 to June 23
		Excavator	6	10			
		Dump Truck	84	10	8	6.6	
		Sheeps Foot Compactor	0	10			
		Bulldozer	6	10			
		Motor Grader	0	10			
		Water Truck	2	2			
		Worker Commute	20	10	1	22	
		Dust Emission	1.5	10			

SOUTHPORT SACRAMENTO RIVER EIP SITE
HIGH EMISSIONS ESTIMATE SUMMARY - (Unfavorable Scenario)

CMA #3 PHASE 2 Project Site Related Activities

S	Construction Phase	Equipment	#	Days	Truck Trips	RT Miles	Daily Earthwork Rate	Projected Time Frame	
A	Roadway Removal	Cold Planer	1	2				May 1 to	May 2
		Scraper	2	2					
		Dump Truck	5	2	17	20			
		Bulldozer	1	2					
		Excavator	1	2					
		Worker Commute	5	2	1	22			
	Roadway Replace	Dump Truck	18	3	17	20		July 23 to	July 26
		Vibratory Compactor	2	4					
		Asphalt Paver	1	2					
		Asphalt Compactor	1	4					
		Motor Grader	2	4					
		Bulldozer	2	4					
		Worker Commute	8	4	1	22			
	Stripping	Wheel Tractor Scraper	3	9			4.17 Ac per day	May 3 to	May 14
		Bulldozer	1	12					
		Dump Truck	10	12	17	20			
		Excavator	1	12					
		Worker Commute	5	12	1	22			
		Dust Emission	4.2	12					
	Levee Degrade	Scraper	17	12			3,667 CY per day	May 15 to	June 26
		Bulldozer	1	43					
		Dump Truck	10	43	17	20			
		Excavator	1	43					
		Worker Commute	19	43	1	22			
		Dust Emission	0.4	43					
	SB Cutoff Wall Installation	Dump Truck	3	7	53	0.25		June 27 to	July 3
		Bulldozer	1	7					
		Long Reach Excavator	1	7					
		Hydraulic Excavator	1	7					
		Rough Terrain/Telehandle	1	7					
		Worker Commute	4	7	1	22			
	Soil Borrow Extraction/Levee Placement	Scraper	10	19			14,024 CY per day	July 4 to	July 22
		Excavator	4	19					
		Dump Truck	84	19	0	0			
		Sheeps Foot Compactor	1	19					
		Bulldozer	2	19					
		Motor Grader	1	19					
		Water Truck	2	4					
		Worker Commute	20	19	1	22			
		Dust Emission	1.4	19					

	Rip Rap Installation	Crane	6	59				July 27 to	September 23
		Bulldozer	3	59					
		Hydraulic Excavator	3	59					
		Towboat	1	59	1.5	180			
		Worker Commute	13	59	1	22			
	Utility Relocation	Utility/Pole Truck	4	18				May 26 to	June 12
		Utility/Pole Truck	4	18					
		Worker Commute	8	59	1	22			
	Drainage	Excavator	3	2				October 6 to	October 7
		Front end loader	1	2					
		Dump Truck	6	2					
		Compressor	1	2					
		Worker Commute	5	2	1	22			
	Building Demo	Bulldozer	6	31				May 1 to	May 31
		Front End Loader	6	31					
		Excavator	6	31					
		Haul Truck	1	6	13	20			
		Worker Commute	18	31	1	22			
		Dust Emission	1.9	6					
	Roadway Removal	Cold Planer	1	1				May 1	
		Scraper	2	1					
		Dump Truck	6	1	17	20			
		Bulldozer	1	1					
		Excavator	1	1					
		Worker Commute	5	1	1	22			
	Roadway Replace	Dump Truck	15	3	15	20		July 13 to	July 17
		Vibratory Compactor	2	5					
		Asphalt Paver	1	1					
		Asphalt Compactor	1	5					
		Motor Grader	2	5					
		Bulldozer	2	5					
		Worker Commute	8	5	1	22			
	Stripping	Wheel Tractor Scraper	3	6			4.43 Ac per day	June 1 to	June 7
		Bulldozer	1	7					
		Dump Truck	10	7	17	20			
		Excavator	1	7					
		Worker Commute	5	7	1	22			
B		Dust Emission	4.4	7					

	Soil Borrow Extraction/Levee Placement	Scraper	10	35			14,487 CY per day	June 8 to	July 12
		Excavator	4	35					
		Dump Truck	84	35	0	0			
		Sheeps Foot Compactor	1	35					
		Bulldozer	2	35					
		Motor Grader	1	35					
		Water Truck	2	7					
		Worker Commute	20	35	1	22			
		Dust Emission	1.4	35					
	Utility Relocation	Utility/Pole Truck	4	23				May 24 to	June 15
		Utility/Pole Truck	4	23					
		Worker Commute	8.0	35	1	22			
	Drainage	Excavator	3	2				August 26 to	August 29
		Front end loader	1	2					
		Dump Truck	6	2					
		Compressor	1	4					
		Worker Commute	5	4	1	22			
	Rip Rap Installation	Crane	6	68				July 18 to	September 23
		Bulldozer	3	68					
		Hydraulic Excavator	3	68					
		Towboat	1	68	1.5	180			
		Worker Commute	13	68	1	22			

Worker Commute	**20**	**145**	**1**	**22**	

CMA #3 PHASE 2 Off-Site Material Borrow Activities

S	Construction Phase	Equipment	#	Days	Truck Trips	RT Miles	Daily Earthwork Rate	Projected Time Frame	
A	Off-Site Material Borrow	Scraper	6	19			14,024 CY per day	July 4 to	July 22
		Excavator	6	19					
		Dump Truck	84	19	8	6.6			
		Sheeps Foot Compactor	0	19					
		Bulldozer	6	19					
		Motor Grader	0	19					
		Water Truck	2	4					
		Worker Commute	20	19	1	22			
		Dust Emission	1.4	19					
B	Off-Site Material Borrow	Scraper	6	35			14,487 CY per day	June 8 to	July 12
		Excavator	6	35					
		Dump Truck	84	35	8	6.6			
		Sheeps Foot Compactor	0	35					
		Bulldozer	6	35					
		Motor Grader	0	35					
		Water Truck	2	7					
		Worker Commute	20	35	1	22			
		Dust Emission	1.4	35					

SOUTHPORT SACRAMENTO RIVER EIP SITE
HIGH EMISSIONS ESTIMATE SUMMARY - (Unfavorable Scenario)
(Sequential Borrow Restoration)
CMA #4 PHASE 1 Project Site Related Activities

S	Construction Phase	Equipment	#	Days	Truck Trips	RT Miles	Daily Earthwork Rate	Projected Time Frame	
	Building Demo	Bulldozer	1	7				May 1 to	May 7
		Front End Loader	1	7					
		Excavator	1	7					
		Haul Truck	1	1	3	20			
		Worker Commute	3	7	1	22			
		Dust Emission	0.4	1					
	Roadway Removal	Cold Planer	1	1				May 1	
		Scraper	2	1					
		Dump Truck	7	1	15	20			
		Bulldozer	1	1					
		Excavator	1	1					
		Worker Commute	5	1	1	22			
	Roadway Replace	Dump Truck	12	2	15	20		October 3 to	October 4
		Vibratory Compactor	1	2					
		Asphalt Paver	1	1					
		Asphalt Compactor	1	2					
		Motor Grader	1	2					
		Bulldozer	1	2					
		Worker Commute	5	2	1	22			
	Stripping	Wheel Tractor Scraper	3	21			4.78 Ac per day	May 30 to	June 25
		Bulldozer	1	27					
		Dump Truck	10	27	17	20			
		Excavator	1	27					
		Worker Commute	5	27	1	22			
		Dust Emission	4.8	27					
	Levee Degrade	Scraper	6	29			3,861 CY per day	June 26 to	August 1
		Bulldozer	1	37					
		Dump Truck	10	36	17	20			
		Excavator	1	37					
		Worker Commute	8	37	1	22			
		Dust Emission	0.4	37					
C									
	Soil Borrow Extraction/Levee Placement	Scraper	10	60			14,736 CY per day	August 2 to	October 1
		Excavator	4	60					
		Dump Truck	84	60	0	0			
		Sheeps Foot Compactor	1	61					
		Bulldozer	2	60					
		Motor Grader	1	61					
		Water Truck	2	13					
		Worker Commute	20	61	1	22			
		Dust Emission	1.5	61					
	Rip Rap Installation	Crane	4	44				October 5 to	November 1
		Bulldozer	2	44					
		Hydraulic Excavator	2	44					
		Towboat	1	44	1.5	180			
		Worker Commute	9	44	1	22			
	Planting	Worker Commute	10	27	1	22		October 1	October 27
		Pickup	1	27	1	10			
		OffRoad Truck	2	27	1	10			
	Irrigation	Trencher	1	15	0	0		October 1	October 15
		Worker Commute	5	15	1	22			
		Pickup	1	15	1	10			
		Drill Rig	1	1	0	0			

	Utility Relocation	Utility/Pole Truck	4	22				May 8 to May 29
		Utility/Pole Truck	4	22				
		Worker Commute	8	22	1	22		
	Drainage	Excavator	2	1				October 2 to October 2
		Front End Loader	1	1				
		Dump Truck	3	1				
		Compressor	1	1				
		Worker Commute	4	1	1	22		
	Building Demo	Bulldozer	1	17				May 1 to May 17
		Front End Loader	1	17				
		Excavator	1	17				
		Haul Truck	1	1	7	20		
		Worker Commute	3	17	1	22		
		Dust Emission	1.0	1				
	Roadway Removal	Cold Planer	1	1				May 1
		Scraper	1	1				
		Dump Truck	3	1	15	20		
		Bulldozer	1	1				
		Excavator	1	1				
		Worker Commute	4	1	1	22		
	Roadway Replace	Dump Truck	11	2	14	20		July 9 to July 10
		Vibratory Compactor	1	2				
		Asphalt Paver	1	1				
		Asphalt Compactor	1	2				
		Motor Grader	1	2				
		Bulldozer	1	2				
		Worker Commute	5	2	1	22		
	Stripping	Wheel Tractor Scraper	3	9			4.55 Ac per day	May 29 to June 8
		Bulldozer	1	11				
		Dump Truck	10	11	17	20		
		Excavator	1	11				
		Worker Commute	5	11	1	22		
		Dust Emission	4.5	11				
D	SB Cutoff Wall Installation	Dump Truck:	3	7	53	0.25		June 9 to June 15
		Bulldozer	1	7				
		Long Reach Excavator	1	7				
		Hydraulic Excavator	1	7				
		Rough Terrain/Telehandler	1	7				
		Worker Commute	4	7	1	22		
	Soil Borrow Extraction/Levee Placement	Scraper	10	15			14,077 CY per day	June 16 to June 30
		Excavator	4	15				
		Dump Truck	84	15	0	0		
		Sheeps Foot Compactor	1	15				
		Bulldozer	2	15				
		Motor Grader	1	15				
		Water Truck	2	3				
		Worker Commute	20	15	1	22		
		Dust Emission	1.4	15				

	Rip Rap Installation	Crane	4	1				July 11 to July 16
		Bulldozer	2	1				
		Hydraulic Excavator	2	1				
		Towboat	1	1	1.5	180		
		Worker Commute	9	1	1	22		
	Utility Relocation	Utility/Pole Truck	3	11				May 18 to May 28
		Utility/Pole Truck	3	11				
		Worker Commute	6	11	1	22		
	Drainage	Excavator	3	3				July 1 to July 8
		Front End Loader	1	3				
		Dump Truck	6	3				
		Compressor	1	8				
		Worker Commute	5	8	1	22		
	Roadway Replace	Dump Truck	15	3	14	20		July 3 to July 6
		Vibratory Compactor	2	4				
		Asphalt Paver	1	1				
		Asphalt Compactor	1	4				
		Motor Grader	2	4				
		Bulldozer	2	4				
		Worker Commute	8	4	1	22		
	Stripping	Wheel Tractor Scraper	3	8			4.41 Ac per day	May 1 to May 10
		Bulldozer	1	10				
		Dump Truck	10	10	17	20		
		Excavator	1	10				
		Worker Commute	5	10	1	22		
		Dust Emission	4.4	10				
	SB Cutoff Wall Installation	Dump Truck	3	11	53	0.25		May 29 to June 8
		Bulldozer	1	11				
		Long Reach Excavator	1	11				
		Hydraulic Excavator	1	11				
		Rough Terrain/Telehandler	1	11				
		Worker Commute	4	11	1	22		
	Soil Borrow Extraction/Levee Placement	Scraper	10	23			14,806 CY per day	June 9 to July 1
		Excavator	9	23				
		Dump Truck	95	23	0	0		
		Sheeps Foot Compactor	1	23				
		Bulldozer	2	23				
		Motor Grader	1	23				
		Water Truck	2	5				
		Worker Commute	25	23	1	22		
		Dust Emission	1.5	23				
E	Rip Rap Installation	Crane	4	4				June 26 to June 29
		Bulldozer	2	4				
		Hydraulic Excavator	2	4				
		Towboat	5	4	1.5	180		
		Worker Commute	0	4	1	22		
	Wet Well Excavation/Installation	Crane	0	2				June 13 to June 14
		Front End Loader	0	1				
		Dump Truck	0	1	1	20		
		Worker Commute	0	2	1	22		
	Pump Station Installation	Crane	0	0				June 15 to June 16
		Front End Loader	0	0				
		Concrete Truck	0	0	0	0		
		Worker Commute	0	0	0	0		
	Trench	Excavator	0	1				

	Excavation & Forcemain Installation	Dump Truck	0	1	1	20	596 CY per day	June 17 to	June 21
		Front End Loader	0	1					
		Pipe Layer	0	5					
		Worker Commute	0	5	1	22			
		Dust Emission	0.0	5					
	Utility Relocation	Utility/Pole Truck	3	18				May 11 to	May 28
		Utility/Pole Truck	3	18					
		Worker Commute	6	18	1	22			
	Drainage	Excavator	2	1				July 2 to	July 2
		Front End Loader	1	1					
		Dump Truck	3	1					
		Compressor	1	1					
		Worker Commute	4	1	1	22			
F	Building Demo	Bulldozer	2	30				May 1 to	May 30
		Front End Loader	2	30					
		Excavator	2	30					
		Haul Truck	1	2	13	20			
		Worker Commute	6	30	1	22			
		Dust Emission	1.9	2					
	Roadway Removal	Cold Planer	1	1				May 1	
		Scraper	2	1					
		Dump Truck	7	1	15	20			
		Bulldozer	1	1					
		Excavator	1	1					
		Worker Commute	5	1	1	22			
	Roadway Replace	Dump Truck	16	3	14	20		August 30 to	September 3
		Vibratory Compactor	2	5					
		Asphalt Paver	1	1					
		Asphalt Compactor	1	5					
		Motor Grader	2	5					
		Bulldozer	2	5					
		Worker Commute	8	5	1	22			
	Stripping	Wheel Tractor Scraper	3	23			4.78 Ac per day	June 29 to	July 27
		Bulldozer	1	29					
		Dump Truck	10	29	17	20			
		Excavator	1	29					
		Worker Commute	5	29	1	22			
		Dust Emission	4.8	29					
	Soil Borrow Extraction/Levee Placement	Scraper	14	30			22,462 CY per day	July 28 to	August 26
		Excavator	6	30					
		Dump Truck	117	30	0	0			
		Sheeps Foot Compactor	1	30					
		Bulldozer	2	30					
		Motor Grader	1	30					
		Water Truck	2	5					
		Worker Commute	26	30	1	22			
		Dust Emission	2.2	30					
	Rip Rap Installation	Crane	10	20				September 4 to	September 23
		Bulldozer	5	20					
		Hydraulic Excavator	5	20					
		Towboat	1	20	1.5	180			
		Worker Commute	21	20	1	22			
	Existing Pump Station Removal	Bulldozer	1	2				May 1 to	May 2
		Front End Loader	1	2					
		Excavator	1	2					
		Haul Truck	1	2	1	20			
		Worker Commute	3	2	1	22			

		Dust Emission	0.1	2				
	Utility Relocation	Utility/Pole Truck	3	29				May 31 to June 28
		Utility/Pole Truck	3	29				
		Worker Commute	6	29	1	22		
	Drainage	Excavator	3	2				August 27 to August 29
		Front End Loader	1	2				
		Dump Truck	6	2				
		Compressor	1	3				
		Worker Commute	5	3	1	22		

G	Building Demo	Bulldozer	1	5				May 1 to	May 5
		Front End Loader	1	5					
		Excavator	1	5					
		Haul Truck	1	1	1	20			
		Worker Commute	3	5	1	22			
		Dust Emission	0.1	1					
	Roadway Replace	Dump Truck	8	1	14	20		June 9	
		Vibratory Compactor	1	1					
		Asphalt Paver	0	0					
		Asphalt Compactor	0	0					
		Motor Grader	1	1					
		Bulldozer	1	1					
		Worker Commute	3	1	1	22			
	Stripping	Wheel Tractor Scraper	3	8			4.40 Ac per day	May 19 to	May 28
		Bulldozer	1	10					
		Dump Truck	10	10	17	20			
		Excavator	1	10					
		Worker Commute	5	10	1	22			
		Dust Emission	4.4	10					
	SB Cutoff Wall Installation	Dump Truck	3	10	53	0.25		May 29 to	June 7
		Bulldozer	1	10					
		Long Reach Excavator	1	10					
		Hydraulic Excavator	1	10					
		Rough Terrain/Telehandler	1	10					
		Worker Commute	4	10	1	22			
	Soil Borrow Extraction/Levee Placement	Scraper	10	10			14,235 CY per day	June 8 to	June 17
		Excavator	9	10					
		Dump Truck	95	10	14	20			
		Sheeps Foot Compactor	1	10					
		Bulldozer	2	10					
		Motor Grader	1	10					
		Water Truck	2	2					
		Worker Commute	25	10	1	22			
		Dust Emission	1.4	10					
	Utility Relocation	Utility/Pole Truck	3	13				May 6 to	May 18
		Utility/Pole Truck	3	13					
		Worker Commute	6	13	1	22			
	Drainage	Excavator	3	1				June 8 to	June 8
		Front End Loader	1	1					
		Dump Truck	6	1					
		Compressor	1	1					
		Worker Commute	5	1	1	22			
	Rip Rap Installation	Crane	8	10				June 10 to	June 19
		Bulldozer	4	10					
		Hydraulic Excavator	4	10					
		Towboat	1	10	1.5	180			
		Worker Commute	17	10	1	22			

Worker Commute	**20**	**244**	**1**	**22**

CMA #4 PHASE 1 Off-Site Material Borrow Activities

S	Construction Phase	Equipment	#	Days	Truck Trips	RT Miles	Daily Earthwork Rate	Projected Time Frame	
C	Off-Site Material Borrow	Scraper	14	25			21,772 CY per day	August 2 to	October 1
		Excavator	6	25					
		Dump Truck	84	25	16	6.6			
		Sheeps Foot Compactor	1	25					
		Bulldozer	2	25					
		Motor Grader	1	25					
		Water Truck	2	4					
		Worker Commute	26	25	1	22			
		Dust Emission	2.2	25					

D	Off-Site Material Borrow	Scraper	14	25			14,077 CY per day	June 16 to	June 30
		Excavator	6	25					
		Dump Truck	84	25	17	6.6			
		Sheeps Foot Compactor	1	25					
		Bulldozer	2	25					
		Motor Grader	1	25					
		Water Truck	2	4					
		Worker Commute	26	25	1	22			
		Dust Emission	1.4	25					
E	Off-Site Material Borrow	Scraper	14	25			14,928 CY per day	June 9 to	July 1
		Excavator	6	25					
		Dump Truck	95	25	14	6.6			
		Sheeps Foot Compactor	1	25					
		Bulldozer	2	25					
		Motor Grader	1	25					
		Water Truck	2	4					
		Worker Commute	26	25	1	22			
		Dust Emission	1.5	25					
F	Off-Site Material Borrow	Scraper	14	25			22,196 CY per day	July 28 to	August 26
		Excavator	6	25					
		Dump Truck	117	25	17	6.6			
		Sheeps Foot Compactor	1	25					
		Bulldozer	2	25					
		Motor Grader	1	25					
		Water Truck	2	4					
		Worker Commute	26	25	1	22			
		Dust Emission	2.2	25					
G	Off-Site Material Borrow	Scraper	14	25			14,235 CY per day	June 8 to	June 17
		Excavator	6	25					
		Dump Truck	95	25	14	6.6			
		Sheeps Foot Compactor	1	25					
		Bulldozer	2	25					
		Motor Grader	1	25					
		Water Truck	2	4					
		Worker Commute	26	25	1	22			
		Dust Emission	1.4	25					

SOUTHPORT SACRAMENTO RIVER EIP SITE
HIGH EMISSIONS ESTIMATE SUMMARY - (Unfavorable Scenario)
(Sequential Borrow Restoration)
CMA #4 PHASE 2 Project Site Related Activities

S	Construction Phase	Equipment	#	Days	Truck Trips	RT Miles	Daily Earthwork Rate	Projected Time Frame	
	Building Demo	Bulldozer	2	25				May 1 to	May 25
		Front End Loader	2	25					
		Excavator	2	25					
		Haul Truck	1	4	13	20			
		Worker Commute	6	25	1	22			
		Dust Emission	1.9	4					
	Roadway Removal	Cold Planer	1	2				May 1 to	May 2
		Scraper	2	2					
		Dump Truck	5	2	15	20			
		Bulldozer	1	2					
		Excavator	1	1					
		Worker Commute	5	2	1	22			
	Roadway Replace	Dump Truck	9	2	15	20		October 7 to	October 9
		Vibratory Compactor	1	3					
		Asphalt Paver	1	2					
		Asphalt Compactor	1	3					
		Motor Grader	1	3					
		Bulldozer	1	3					
		Worker Commute	5	3	1	22			
	Stripping	Wheel Tractor Scraper	3	13			4.47 Ac per day	June 13 to	June 29
		Bulldozer	1	17					
		Dump Truck	10	17	17	20			
		Excavator	1	17					
		Worker Commute	5	17	1	22			
		Dust Emission	4.5	17					
	Levee Degrade	Scraper	6	54			3,736 CY per day	June 30 to	September 6
		Bulldozer	1	69					
		Dump Truck	10	69	17	20			
		Excavator	1	69					
		Worker Commute	8	69	1	22			
A		Dust Emission	0.4	69					
	SB Cutoff Wall Installation	Dump Truck	3	9	53	0.25		September 7 to	September 15
		Bulldozer	1	9					
		Long Reach Excavator	1	9					
		Hydraulic Excavator	1	9					
		Rough Terrain/Telehandler	1	9					
		Worker Commute	4	9	1	22			
	Soil Borrow Extraction/Levee Placement	Scraper	10	19			14,024 CY per day	September 16 to	October 4
		Excavator	4	19					
		Dump Truck	84	19	0	0			
		Sheeps Foot Compactor	1	19					
		Bulldozer	2	19					
		Motor Grader	1	19					

		Water Truck	2	4				
		Worker Commute	20	19	1	22		
		Dust Emission	1.4	19				
	Rip Rap Installation	Crane	8	9				October 10 to October 18
		Bulldozer	4	9				
		Hydraulic Excavator	4	9				
		Towboat	1	9	1.5	180		
		Worker Commute	17	9	1	22		
	Utility Relocation	Utility/Pole Truck	4	18				May 26 to June 12
		Utility/Pole Truck	4	18				
		Worker Commute	8	18	1	22		
	Drainage	Excavator	3	2				October 5 to October 6
		Front end loader	1	2				
		Dump Truck	6	2				
		Compressor	1	2				
		Worker Commute	5	2	1	22		
	Building Demo	Bulldozer	3	23				May 1 to May 23
		Front End Loader	3	23				
		Excavator	3	23				
		Haul Truck	1	7	13	20		
		Worker Commute	9	23	1	22		
		Dust Emission	1.9	7				
	Roadway Removal	Cold Planer	1	1				May 1
		Scraper	2	1				
		Dump Truck	6	1	17	20		
		Bulldozer	1	1				
		Excavator	1	1				
		Worker Commute	5	1	1	22		
	Roadway Replace	Dump Truck	18	3	15	20		November 4 to November 9
		Vibratory Compactor	2	6				
		Asphalt Paver	1	1				
		Asphalt Compactor	1	6				
		Motor Grader	1	3				
		Bulldozer	1	3				
		Worker Commute	6	6	1	22		
	Stripping	Wheel Tractor Scraper	3	24			4.74 Ac per day	June 16 to July 16
		Bulldozer	1	31				
		Dump Truck	10	31	17	20		
		Excavator	1	31				
		Worker Commute	5	31	1	22		
		Dust Emission	4.7	31				

B	Levee Degrade	Scraper	6	31			3,873 CY per day	July 17 to	August 24
		Bulldozer	1	39					
		Dump Truck	10	38	17	20			
		Excavator	1	39					
		Worker Commute	8	39	1	22			
		Dust Emission	0.4	39					
	SB Cutoff Wall Installation	Dump Truck	3	1	53	0.25		August 25 to	August 25
		Bulldozer	1	1					
		Long Reach Excavator	1	1					
		Hydraulic Excavator	1	1					
		Rough Terrain/Telehandler	1	1					
		Worker Commute	4	1	1	22			
	Soil Borrow Extraction/Levee Placement	Scraper	10	67			14,956 CY per day	August 25 to	October 30
		Excavator	9	67					
		Dump Truck	95	67	0	0			
		Sheeps Foot Compactor	1	67					
		Bulldozer	2	67					
		Motor Grader	1	67					
		Water Truck	2	14					
		Worker Commute	25	67	1	22			
		Dust Emission	1.5	67					
	Utility Relocation	Utility/Pole Truck	4	23				May 24 to	June 15
		Utility/Pole Truck	4	23					
		Worker Commute	8.0	67	1	22			
	Drainage	Excavator	3	2				October 31 to	November 3
		Front end loader	1	2					
		Dump Truck	6	2					
		Compressor	1	4					
		Worker Commute	5	4	1	22			
	Rip Rap Installation	Crane	6	40				November 10 to	December 19
		Bulldozer	3	40					
		Hydraulic Excavator	3	40					
		Towboat	1	40	1.5	180			
		Worker Commute	13	40	1	22			
		Worker Commute	**20**	**232**	**1**	**22**			

CMA #4 PHASE 2 Off-Site Material Borrow Activities								
S	**Construction Phase**	**Equipment**	**#**	**Days**	**Truck Trips**	**RT Miles**	**Daily Earthwork Rate**	**Projected Time Frame**
	Off-Site	Scraper	14	26				
		Excavator	6	26				
		Dump Truck	84	26	8	6.6		
		Sheeps Foot Compactor	1	26				

A	Material Borrow	Bulldozer	2	26			14,024 CY per day	September 16 to	October 4
		Motor Grader	1	26					
		Water Truck	2	4					
		Worker Commute	26	26	1	22			
		Dust Emission	1.4	26					
B	Off-Site Material Borrow	Scraper	14	26			14,024 CY per day	August 25 to	October 30
		Excavator	6	26					
		Dump Truck	95	26	14	6.6			
		Sheeps Foot Compactor	1	26					
		Bulldozer	2	26					
		Motor Grader	1	26					
		Water Truck	2	4					
		Worker Commute	26	26	1	22			
		Dust Emission	1.4	26					

SOUTHPORT SACRAMENTO RIVER EIP SITE
HIGH EMISSIONS ESTIMATE SUMMARY - (Unfavorable Scenario)
(Sequential Borrow Restoration)
CMA #5 PHASE 1 Project Site Related Activities

S	Construction Phase	Equipment	#	Days	Truck Trips	RT Miles	Projected Time Frame
	Building Demo	Bulldozer	1	7			May 1 to May 9
		Front End Loader	1	7			
		Excavator	1	7			
		Haul Truck	1	1	3	20	
		Worker Commute	3	7	1	22	
		Dust Emission	0.4	1			
	Roadway Removal	Cold Planer	1	1			May 1
		Scraper	2	1			
		Dump Truck	7	1	15	20	
		Bulldozer	1	1			
		Excavator	1	1			
		Worker Commute	5	1	1	22	
	Roadway Replace	Dump Truck	12	2	15	20	October 5 to October 6
		Vibratory Compactor	1	2			
		Asphalt Paver	1	1			
		Asphalt Compactor	1	2			
		Motor Grader	1	2			
		Bulldozer	1	2			
		Worker Commute	5	2	1	22	
	Stripping	Wheel Tractor Scraper	3	21			June 1 to June 27
		Bulldozer	1	27			
		Dump Truck	10	27	17	20	
		Excavator	1	27			
		Worker Commute	5	27	1	22	
		Dust Emission	4.8	27			
	Levee Degrade	Scraper	6	29			June 28 to August 3
		Bulldozer	1	37			
		Dump Truck	10	36	17	20	
		Excavator	1	37			
		Worker Commute	8	37	1	22	
		Dust Emission	0.4	37			
C							
	Soil Borrow Extraction/Levee Placement	Scraper	10	60			August 4 to October 3
		Excavator	4	60			
		Dump Truck	84	60	0	0	
		Sheeps Foot Compactor	1	61			
		Bulldozer	2	60			
		Motor Grader	1	61			
		Water Truck	2	13			
		Worker Commute	20	61	1	22	
		Dust Emission	1.5	61			
	Rip Rap Installation	Crane	4	44			October 7 to November 19
		Bulldozer	2	44			
		Hydraulic Excavator	2	44			
		Towboat	1	44	1.5	180	
		Worker Commute	9	44	1	22	
	Planting	Worker Commute	10	27	1	22	October 1 October 27
		Pickup	1	27	1	10	
		OffRoad Truck	2	27	1	10	
	Irrigation	Trencher	1	15	0	0	October 1 October 15
		Worker Commute	5	15	1	22	
		Pickup	1	15	1	10	
		Drill Rig	1	1	0	0	

	Utility Relocation	Utility/Pole Truck	4	22			May 10 to May 31
		Utility/Pole Truck	4	22			
		Worker Commute	8	22	1	22	
	Drainage	Excavator	2	1			October 4 to October 4
		Front End Loader	1	1			
		Dump Truck	3	1			
		Compressor	1	1			
		Worker Commute	4	1	1	22	
	Building Demo	Bulldozer	1	17			May 1 to May 17
		Front End Loader	1	17			
		Excavator	1	17			
		Haul Truck	1	1	7	20	
		Worker Commute	3	17	1	22	
		Dust Emission	1.0	1			
	Roadway Removal	Cold Planer	1	1			May 1
		Scraper	1	1			
		Dump Truck	3	1	15	20	
		Bulldozer	1	1			
		Excavator	1	1			
		Worker Commute	4	1	1	22	
	Roadway Replace	Dump Truck	11	2	14	20	July 9 to July 10
		Vibratory Compactor	1	2			
		Asphalt Paver	1	1			
		Asphalt Compactor	1	2			
		Motor Grader	1	2			
		Bulldozer	1	2			
		Worker Commute	5	2	1	22	
	Stripping	Wheel Tractor Scraper	3	9			May 29 to June 8
		Bulldozer	1	11			
		Dump Truck	10	11	17	20	
		Excavator	1	11			
		Worker Commute	5	11	1	22	
		Dust Emission	4.5	11			
D	SB Cutoff Wall Installation	Dump Truck	3	7	53	0.25	June 9 to June 15
		Bulldozer	1	7			
		Long Reach Excavator	1	7			
		Hydraulic Excavator	1	7			
		gh Terrain/Telehandler For	1	7			
		Worker Commute	4	7	1	22	
	Soil Borrow Extraction/Levee Placement	Scraper	10	15			June 16 to June 30
		Excavator	4	15			
		Dump Truck	84	15	0	0	
		Sheeps Foot Compactor	1	15			
		Bulldozer	2	15			
		Motor Grader	1	15			
		Water Truck	2	3			
		Worker Commute	20	15	1	22	
		Dust Emission	1.4	15			

	Rip Rap Installation	Crane	4	1			July 11 to July 11
		Bulldozer	2	1			
		Hydraulic Excavator	2	1			
		Towboat	1	1	1.5	180	
		Worker Commute	9	1	1	22	
	Utility Relocation	Utility/Pole Truck	3	11			May 18 to May 28
		Utility/Pole Truck	3	11			
		Worker Commute	6	11	1	22	
	Drainage	Excavator	3	3			July 1 to July 8
		Front End Loader	1	3			
		Dump Truck	6	3			
		Compressor	1	8			
		Worker Commute	5	8	1	22	
	Roadway Replace	Dump Truck	15	3	14	20	June 22 to June 25
		Vibratory Compactor	2	4			
		Asphalt Paver	1	1			
		Asphalt Compactor	1	4			
		Motor Grader	2	4			
		Bulldozer	2	4			
		Worker Commute	8	4	1	22	
	Stripping	Wheel Tractor Scraper	3	8			May 1 to May 10
		Bulldozer	1	10			
		Dump Truck	10	10	17	20	
		Excavator	1	10			
		Worker Commute	5	10	1	22	
		Dust Emission	4.4	10			
	SB Cutoff Wall Installation	Dump Truck	3	11	53	0.25	June 26 to July 6
		Bulldozer	1	11			
		Long Reach Excavator	1	11			
		Hydraulic Excavator	1	11			
		gh Terrain/Telehandler For	1	11			
		Worker Commute	4	11	1	22	
E	Soil Borrow Extraction/Levee Placement	Scraper	10	23			May 29 to June 20
		Excavator	9	23			
		Dump Truck	95	23	0	0	
		Sheeps Foot Compactor	1	23			
		Bulldozer	2	23			
		Motor Grader	1	23			
		Water Truck	2	5			
		Worker Commute	25	23	1	22	
		Dust Emission	1.5	23			
	Rip Rap Installation	Crane	4	4			June 26 to June 29
		Bulldozer	2	4			
		Hydraulic Excavator	2	4			
		Towboat	5	4	1.5	180	
		Worker Commute	13	4	1	22	
	Utility Relocation	Utility/Pole Truck	3	18			May 11 to May 28
		Utility/Pole Truck	3	18			
		Worker Commute	6	18	1	22	
	Drainage	Excavator	2	1			June 21 to June 21
		Front End Loader	1	1			
		Dump Truck	3	1			
		Compressor	1	1			
		Worker Commute	4	1	1	22	
		Bulldozer	2	30			

	Building Demo	Front End Loader	2	30			May 1 to May 30
		Excavator	2	30			
		Haul Truck	1	2	13	20	
		Worker Commute	6	30	1	22	
		Dust Emission	1.9	2			
	Roadway Removal	Cold Planer	1	1			May 1
		Scraper	2	1			
		Dump Truck	7	1	15	20	
		Bulldozer	1	1			
		Excavator	1	1			
		Worker Commute	5	1	1	22	
	Roadway Replace	Dump Truck	16	3	14	20	November 15 to November 19
		Vibratory Compactor	2	5			
		Asphalt Paver	1	1			
		Asphalt Compactor	1	5			
		Motor Grader	2	5			
		Bulldozer	2	5			
		Worker Commute	8	5	1	22	
	Stripping	Wheel Tractor Scraper	3	23			June 29 to July 27
		Bulldozer	1	29			
		Dump Truck	10	29	17	20	
		Excavator	1	29			
		Worker Commute	5	29	1	22	
		Dust Emission	4.8	29			
	Levee Degrade	Scraper	6	36			July 28 to September 10
		Bulldozer	1	45			
		Dump Truck	10	45	17	20	
		Excavator	1	45			
		Worker Commute	8	45	1	22	
F		Dust Emission	0.4	45			
	Soil Borrow Extraction/Levee Placement	Scraper	10	62			September 11 to November 11
		Excavator	4	62			
		Dump Truck	84	62	0	0	
		Sheeps Foot Compactor	1	62			
		Bulldozer	2	62			
		Motor Grader	1	62			
		Water Truck	2	13			
		Worker Commute	20	62	1	22	
		Dust Emission	1.5	62			
	Rip Rap Installation	Crane	4	58			November 20 to January 16
		Bulldozer	2	58			
		Hydraulic Excavator	2	58			
		Towboat	1	58	1.5	180	
		Worker Commute	9	58	1	22	

	Existing Pump Station Removal	Bulldozer	1	2			May 1 to May 2
		Front End Loader	1	2			
		Excavator	1	2			
		Haul Truck	1	2	1	20	
		Worker Commute	3	2	1	22	
		Dust Emission	0.1	2			
	Utility Relocation	Utility/Pole Truck	3	29			May 31 to June 28
		Utility/Pole Truck	3	29			
		Worker Commute	6	29	1	22	
	Drainage	Excavator	3	2			November 12 to November 14
		Front End Loader	1	2			
		Dump Truck	6	2			
		Compressor	1	3			
		Worker Commute	5	3	1	22	
G	Building Demo	Bulldozer	1	5			May 1 to May 5
		Front End Loader	1	5			
		Excavator	1	5			
		Haul Truck	1	1	1	20	
		Worker Commute	3	5	1	22	
		Dust Emission	0.1	1			
	Roadway Replace	Dump Truck	8	1	14	20	June 19
		Vibratory Compactor	1	1			
		Asphalt Paver	0	0			
		Asphalt Compactor	0	0			
		Motor Grader	1	1			
		Bulldozer	1	1			
		Worker Commute	3	1	1	22	
	Stripping	Wheel Tractor Scraper	3	8			May 19 to May 28
		Bulldozer	1	10			
		Dump Truck	10	10	17	20	
		Excavator	1	10			
		Worker Commute	5	10	1	22	
		Dust Emission	4.4	10			
	SB Cutoff Wall Installation	Dump Truck	3	10	53	0.25	May 29 to June 7
		Bulldozer	1	10			
		Long Reach Excavator	1	10			
		Hydraulic Excavator	1	10			
		gh Terrain/Telehandler For	1	10			
		Worker Commute	4	10	1	22	
	Soil Borrow Extraction/Levee Placement	Scraper	10	10			June 8 to June 17
		Excavator	9	10			
		Dump Truck	95	10	0	0	
		Sheeps Foot Compactor	1	10			
		Bulldozer	2	10			
		Motor Grader	1	10			
		Water Truck	2	2			
		Worker Commute	25	10	1	22	
		Dust Emission	1.4	10			
	Utility Relocation	Utility/Pole Truck	3	13			May 6 to May 18
		Utility/Pole Truck	3	13			
		Worker Commute	6	13	1	22	
	Drainage	Excavator	3	1			June 18 to June 18
		Front End Loader	1	1			
		Dump Truck	6	1			
		Compressor	1	1			
		Worker Commute	5	1	1	22	
	Rip Rap Installation	Crane	4	20			June 20 to July 9
		Bulldozer	2	20			
		Hydraulic Excavator	2	20			
		Towboat	1	20	1.5	180	

		Worker Commute	9	20	1	22	

Worker Commute	**20**	**244**	**1**	**22**

CMA #2 PHASE 1 Off-Site Material Borrow Activities							
S	**Construction Phase**	**Equipment**	**#**	**Days**	**Truck Trips**	**RT Miles**	**Projected Time Frame**
C	Off-Site Material Borrow	Scraper	14	14			August 4 to October 3
		Excavator	6	14			
		Dump Truck	84	14	8	6.6	
		Sheeps Foot Compactor	1	14			
		Bulldozer	2	14			
		Motor Grader	1	14			
		Water Truck	2	2			
		Worker Commute	26	14	1	22	
		Dust Emission	2.2	14			
D	Off-Site Material Borrow	Scraper	14	14			June 16 to June 30
		Excavator	6	14			
		Dump Truck	84	14	8	6.6	
		Sheeps Foot Compactor	1	14			
		Bulldozer	2	14			
		Motor Grader	1	14			
		Water Truck	2	2			
		Worker Commute	26	14	1	22	
		Dust Emission	2.2	14			
E	Off-Site Material Borrow	Scraper	14	14			May 29 to June 20
		Excavator	6	14			
		Dump Truck	95	14	7	6.6	
		Sheeps Foot Compactor	1	14			
		Bulldozer	2	14			
		Motor Grader	1	14			
		Water Truck	2	2			
		Worker Commute	26	14	1	22	
		Dust Emission	2.2	14			
F	Off-Site Material Borrow	Scraper	14	14			September 11 to November 11
		Excavator	6	14			
		Dump Truck	84	14	8	6.6	
		Sheeps Foot Compactor	1	14			
		Bulldozer	2	14			
		Motor Grader	1	14			
		Water Truck	2	2			
		Worker Commute	26	14	1	22	
		Dust Emission	2.2	14			
G	Off-Site Material Borrow	Scraper	14	14			June 8 to June 17
		Excavator	6	14			
		Dump Truck	95	14	7	6.6	
		Sheeps Foot Compactor	1	14			
		Bulldozer	2	14			
		Motor Grader	1	14			
		Water Truck	2	2			
		Worker Commute	26	14	1	22	
		Dust Emission	2.2	14			

SOUTHPORT SACRAMENTO RIVER EIP SITE
HIGH EMISSIONS ESTIMATE SUMMARY - (Unfavorable Scenario)
(Sequential Borrow Restoration)
CMA #5 PHASE 2 Project Site Related Activities

S	Construction Phase	Equipment	#	Days	Truck Trips	RT Miles	Daily Earthwork Rate	Projected Time Frame	
	Building Demo	Bulldozer	2	25				May 1 to	May 25
		Front End Loader	2	25					
		Excavator	2	25					
		Haul Truck	1	4	13	20			
		Worker Commute	6	25	1	22			
		Dust Emission	1.9	4					
	Roadway Removal	Cold Planer	1	2				May 1 to	September 20
		Scraper	2	2					
		Dump Truck	5	2	15	20			
		Bulldozer	1	2					
		Excavator	1	1					
		Worker Commute	5	2	1	22			
	Roadway Replace	Dump Truck	12	3	15	20		October 8 to	October 11
		Vibratory Compactor	1	4					
		Asphalt Paver	1	2					
		Asphalt Compactor	1	4					
		Motor Grader	1	4					
		Bulldozer	1	4					
		Worker Commute	5	4	1	22			
	Stripping	Wheel Tractor Scrape	3	13			4.47 Ac per day	June 13 to	June 29
		Bulldozer	1	17					
		Dump Truck	10	17	17	20			
		Excavator	1	17					
		Worker Commute	5	17	1	22			
		Dust Emission	4.5	17					
	Levee Degrade	Scraper	6	54			3,682 CY per day	June 30 to	September 7
		Bulldozer	1	70					
		Dump Truck	10	70	17	20			
		Excavator	1	70					
		Worker Commute	8	70	1	22			
A		Dust Emission	0.4	70					
	SB Cutoff Wall Installation	Dump Truck	3	9	53	0.25		September 8 to	September 16
		Bulldozer	1	9					
		Long Reach Excavato	1	9					
		Hydraulic Excavator	1	9					
		Rough Terrain/Telehand	1	9					
		Worker Commute	4	9	1	22			
	Soil Borrow Extraction/Leve e Placement	Scraper	10	19			14,024 CY per day	September 17 to	October 5
		Excavator	4	19					
		Dump Truck	84	19	0	0			
		Sheeps Foot Compac	1	19					
		Bulldozer	2	19					
		Motor Grader	1	19					

	Water Truck	2	4				
	Worker Commute	20	19	1	22		
	Dust Emission	1.4	19				
Rip Rap Installation	Crane	8	21				October 12 to November 1
	Bulldozer	4	21				
	Hydraulic Excavator	4	21				
	Towboat	1	21	1.5	180		
	Worker Commute	17	21	1	22		
Utility Relocation	Utility/Pole Truck	4	18				May 26 to June 12
	Utility/Pole Truck	4	18				
	Worker Commute	8	21	1	22		
Drainage	Excavator	3	2				October 6 to October 7
	Front end loader	1	2				
	Dump Truck	6	2				
	Compressor	1	2				
	Worker Commute	5	2	1	22		
Building Demo	Bulldozer	3	23				May 1 to May 23
	Front End Loader	3	23				
	Excavator	3	23				
	Haul Truck	1	7	13	20		
	Worker Commute	9	23	1	22		
	Dust Emission	1.9	7				
Roadway Removal	Cold Planer	1	1				May 1
	Scraper	2	1				
	Dump Truck	6	1	17	20		
	Bulldozer	1	1				
	Excavator	1	1				
	Worker Commute	5	1	1	22		
Roadway Replace	Dump Truck	18	3	15	20		August 30 to September 4
	Vibratory Compactor	2	6				
	Asphalt Paver	1	1				
	Asphalt Compactor	1	6				
	Motor Grader	1	3				
	Bulldozer	1	3				
	Worker Commute	6	6	1	22		
Stripping	Wheel Tractor Scrape	3	24			4.74 Ac per day	June 16 to July 16
	Bulldozer	1	31				
	Dump Truck	10	31	17	20		
	Excavator	1	31				
	Worker Commute	5	31	1	22		
	Dust Emission	4.7	31				

	Levee Degrade	Scraper	6	31			3,873 CY per day	July 17 to August 24
		Bulldozer	1	39				
		Dump Truck	10	38	17	20		
		Excavator	1	39				
		Worker Commute	8	39	1	22		
		Dust Emission	0.4	39				
	SB Cutoff Wall Installation	Dump Truck	3	1	53	0.25		August 25 to August 25
		Bulldozer	1	1				
		Long Reach Excavato	1	1				
		Hydraulic Excavator	1	1				
		Rough Terrain/Teleha	1	1				
		Worker Commute	4	1	1	22		
B	Soil Borrow Extraction/Leve e Placement	Scraper	10	80			14,854 CY per day	August 26 to November 13
		Excavator	9	80				
		Dump Truck	95	80	0	0		
		Sheeps Foot Compac	1	80				
		Bulldozer	2	80				
		Motor Grader	1	80				
		Water Truck	2	16				
		Worker Commute	25	80	1	22		
		Dust Emission	1.5	80				
	Rip Rap Installation	Crane	6	38				November 14 to December 21
		Bulldozer	3	38				
		Hydraulic Excavator	3	38				
		Towboat	1	38	1.5	180		
		Worker Commute	13	38	1	22		
	On-Site Material Borrow Restoration	Scraper	0	0			21,518 CY per day	October 9 to October 20
		Excavator	0	0				
		Dump Truck	0	0	0	0		
		Sheeps Foot Compactor	0	0				
		Bulldozer	0	0				
		Motor Grader	0	0				
		Water Truck	0	0				
		Worker Commute	0	0	0	0		
		Dust Emission	0.0	0				
	Off-Site Material Borrow Restoration	Scraper	0	0			22,186 CY per day	October 9 to November 1
		Excavator	0	0				
		Dump Truck	0	0	0	0		
		Sheeps Foot Compactor	0	0				
		Bulldozer	0	0				
		Motor Grader	0	0				
		Water Truck	0	0				
		Worker Commute	0	0	0	0		
	Utility Relocation	Utility/Pole Truck	4	23				May 24 to June 15
		Utility/Pole Truck	4	23				
		Worker Commute	8	23	1	22		
	Drainage	Excavator	3	2				August 26 to August 29
		Front end loader	1	2				
		Dump Truck	6	2				
		Compressor	1	4				
		Worker Commute	5	4	1	22		

Planting	Worker Commute	10	3	1	22		October 1 to	October 3
	Pickup	1	3	1	10			
	OffRoad Truck	2	3	1	10			
Irrigation	Trencher	1	4	0	0		October 2 to	October 5
	Worker Commute	5	4	1	22			
	Pickup	1	4	1	10			

Worker Commute	**20**	**234**	**1**	**22**

CMA #2 PHASE 2 Off-Site Material Borrow Activities

S	Construction Phase	Equipment	#	Days	Truck Trips	RT Miles	Daily Earthwork Rate	Projected Time Frame	
A	Off-Site Material Borrow	Scraper	14	24			22,186 CY per day	September 17 to	October 5
		Excavator	6	24					
		Dump Truck	84	24	8	6.6			
		Sheeps Foot Compac	1	24					
		Bulldozer	2	24					
		Motor Grader	1	24					
		Water Truck	2	4					
		Worker Commute	26	24	1	22			
		Dust Emission	2.2	24					
B	Off-Site Material Borrow	Scraper	14	24			22,186 CY per day	August 26 to	November 13
		Excavator	6	24					
		Dump Truck	95	24	7	6.6			
		Sheeps Foot Compac	1	24					
		Bulldozer	2	24					
		Motor Grader	1	24					
		Water Truck	2	4					
		Worker Commute	26	24	1	22			
		Dust Emission	2.2	24					

Activities Removed from Levee Degrade								
S	**Construction Phase**	**Equipment**	**#**	**Days**	**Truck Trips**	**RT Miles**	**Daily Earthwork Rate**	**Projected Time Frame**
C	Inlet Outlet Degrade	Scraper	6	8.3333				Removed from last two weeks of Levee Degrade
		Bulldozer	1	10.667				
		Dump Truck	10	10.667	17	20		
		Excavator	1	10.667				
		Worker Commute	8	10.6667	1	22		
F	Inlet Outlet Degrade	Scraper	6	8.3333				Removed from last two weeks of Levee Degrade
		Bulldozer	1	10.667				
		Dump Truck	10	10.667	17	20		
		Excavator	1	10.667				
		Worker Commute	8	10.6667	1	22		

Appendix F

Vegetation and Wildlife Technical Appendix

Appendix F.1

Plant and Wildlife Species Observed in the Project Area

Appendix F.1

Plant and Wildlife Species Observed in the Project Area

F.1.1 Species Observed

Table F-1a. Plant Species Observed in the Project Area

Scientific Name	Common Name
Acer negundo var. *californicum*	Box elder
Acmispon americanus var. *americanus* [*Lotus purshianus*]	Spanish lotus
Agrostis exarata	Spike bentgrass
*Ailanthus altissima**	Tree-of-heaven
Artemisia douglasiana	Mugwort
*Avena barbata**	Slender wild oat
*Avena fatua**	Wild oat
Bacchanris glutinosa [*douglasii*]	Marsh baccharis
Baccharis pilularis	Coyote brush
*Brassica nigra**	Black mustard
*Brassica rapa**	Field mustard
*Bromus diandrus**	Ripgut brome
*Bromus hordeaceus**	Soft chess
Bromus madritensis ssp. *rubens**	Red brome
Campsis radicans	Trumpet creeper
*Carduus pycnocephalus**	Italian thistle
Carex barbarae	Santa Barbara sedge
Carya illinoinensis	Pecan
*Centaurea solstitialis**	Yellow star-thistle
Cephalanthus occidentalis var. *californicus*	Common buttonbush
Chenopodium album	Lamb's quarters
Cichorium intybus	Chicory
*Cirsium vulgare**	Bull thistle
*Convolvulus arvensis**	Bindweed
Conyza canadensis	Horseweed
Croton setigerus	Turkey mullein
*Cynodon dactylon**	Bermuda grass
Cyperus eragrostis	Tall flatsedge
Echinochloa crus-galli	Barnyard grass
Elymus [*Leymus*] *triticoides*	Beardless wildrye
Equisetum arvense	Horsetail
Erodium botrys	Big heronbill
*Eucalyptus globulus**	Blue gum
*Festuca arundinacea**	Tall fescue

Scientific Name	Common Name
Festuca perenne [*Lolium perenne*]*	Italian ryegrass
*Ficus carica**	Edible fig
*Foeniculum vulgare**	Sweet fennel
Frangula [*Rhamnus*] *californica*	Coffeeberry
Fraxinus latifolia	Oregon ash
Galium aparine	Common bedstraw
Gleditsia triacanthos	Honey locust
Gnaphalium palustre	Lowland cudweed
*Hedera helix**	English ivy
Heliotropium curassavicum	Salt heliotrope
Helminthotheca [*Picris*] *echioides**	Bristly ox-tongue
Hordeum murinum ssp. *leporinum**	Foxtail barley
Juglans californica var. *hindsii*	Black walnut
Juncus balticus[2]	Baltic rush
Lactuca serriola	Prickly lettuce
*Lepidium latifolium**	Perennial peppergrass
Lotus corniculatus	Birdsfoot trefoil
Lupinus bicolor	Bicolor lupine
Malva neglecta	Common mallow
Malvella leprosa	Alkali mallow
*Medicago polymorpha**	Bur clover
Medicago sativa	Alfalfa
Melilotus alba	White sweetclover
Mimulus guttatus	Monkeyflower
Morus alba	Mulberry
*Nicotiana glauca**	Tree-tobacco
Olea europaea	Olive
Paspalum dilatatum	Dallisgrass
Persicaria hydropiperoides	Knotweed
Phalaris aquatic*	Harding grass
Phoenix canariensis*	Canary Island date palm
Phoradendron macrophyllum	Big-leaf mistletoe
Plantago lanceolata*	English plantain
Platanus x hispanica	London plane tree
Platanus racemosa	California sycamore
Polygonum arenastrum *ssp.* depressum	Common knotweed
Polygonum aviculare	Prostrate knotweed
Polypogon monspeliensis*	Rabbitsfoot grass
Polypogon interruptus	Ditch rabbitsfoot grass
Populus fremontii ssp. *fremontii*[2]	Fremont cottonwood
Quercus agrifolia	Coast live oak
Quercus lobata	Valley oak

Scientific Name	Common Name
*Raphanus sativus**	Wild radish
*Robinia pseudoacacia**	Black locust
Rubus armeniacus [*discolor*]*	Himalayan blackberry
Rubus ursinus	California blackberry
*Rumex crispus**	Curly dock
Salix exigua	Sandbar willow
Salix gooddingii	Black willow
Salix lasiolepis	Arroyo willow
Sambucus nigra [*mexicana*]	Blue elderberry
Schoenoplectus acutus	Tule
Senecio vulgaris	Old man of spring
*Sesbania punicea**	Purple river-hemp/scarlet wisteria
*Silybum marianum**	Milk-thistle
Sisymbrium officinale	Hedge mustard
Sonchus oleraceus	Common sow thistle
*Sorghum halepense**	Johnsongrass
*Trifolium hirtum**	Rose clover
Triticum aestivum	Common wheat
Typha angustifolia	Narrow-leaved cattail
Ulmus minor	English elm
Verbascum blatteria	Moth mullein
Verbena bonariensis	Purpletop vervain
Vicia villosa	Hairy vetch
Vitis californica	California wild grape

* Species is included on the CDFA Noxious Weed Species List (California Department of Food and Agriculture 2010) (A, B, or C rating) and/or the California Invasive Plant Council California Invasive Plant Inventory (California Invasive Plant Council 2006 and 2007) (High, Moderate, or Limited rating).

1 **Table F-1b. Wildlife Species Observed in the Project Area**

Common Name	Scientific Name
Reptiles	
American bullfrog	*Rana catesbeianna*
Red-eared slider	*Trachemys scripta elegans*
Western pond turtle	*Actinemys marmorata*
Birds	
American crow	*Corvus brachyrhynchos*
Black phoebe (nest)	*Sayornis nigricans*
Brewer's blackbird	*Euphagus cyanocephalus*
European starling	*Sturnus vulgaris*
House finch	*Carpodacus mexicanus)*
House wren	*Troglodytes aedon*
Killdeer (nest)	*Charadrius vociferous*
Mallard	*Anas platyrhynchos*
Mockingbird	*Mimus polyglottos*
Mourning dove	*Zenaida macroura*
Northern flicker	*Colaptes auratus*
Ring-necked pheasant	*Phasianus colchicus*
Red-winged blackbird	*Agelaius phoeniceus*
Red-shouldered hawk	*Buteo lineatus*
Red-tailed hawk (nest)	*Buteo jamaicensis*
Rock dove	*Columba livia*
Swainson's hawk	*Buteo swainsoni*
Turkey vulture	*Cathartes aura*
Western meadow lark	*Sturnella neglecta*
Western scrub jay	*Aphelocoma californica*
White-tailed kite	*Elanus leucaurus*
Yellow-billed magpie	*Pica nuttalli*
Mammals	
California ground squirrel	*Spermophilus beecheyi*
Black-tailed jack rabbit	*Lepus californicus*

2

F.1.2 References

California Department of Food and Agriculture. 2010. *Pest Ratings of Noxious Weed Species and Noxious Weed Seeds.* Available: <http://www.cdfa.ca.gov/phpps/ipc/weedinfo/winfo_pestrating_2010.pdf>. Accessed: July 2011.

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Appendix F.2

Wildlife Species Accounts

Appendix F.2

Species Accounts for Special-Status Wildlife Potentially Occurring in the Project Area

F.2.1 Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle (VELB) is federally listed as threatened under the Federal Endangered Species Act (ESA). The range of the beetle extends throughout the Central Valley of California and associated foothills, from the 3,000-foot-high contour in the east foothills, through the valley floor to the watershed of the Central Valley in the west foothills (U.S. Fish and Wildlife Service 1999a). Elderberry shrubs are found in the remaining riparian forests and grasslands of the Central Valley and adjacent foothills. The beetle often is associated with various plant species, such as Fremont's cottonwood, California sycamore, willow, and oak (U.S. Fish and Wildlife Service 1999a).

Elderberry shrubs are the host plant for VELB and are a common component of the remaining riparian forests of the Central Valley. Elderberry shrubs are also common in upland habitats. Field surveys have found that adult VELB feed on elderberry foliage and perhaps flowers and are present from March through early June. It is during this time that the adults mate. The females lay their eggs, either singly or in small clusters, in bark crevices or at the junction of stem and trunk or leaf petriole and stem. After hatching, a larva burrows into the stem of the elderberry where it creates a gallery that it fills with grass and shredded wood. After the larva transforms into an adult beetle, it chews an exit hole and emerges from the elderberry. The life span of VELB ranges from 1 to 2 years. Studies of the spatial distribution of occupied shrubs suggest that the beetle is a poor disperser. (U.S. Fish and Wildlife Service 1999a.)

F.2.1.1 Status in the Project Area

There are two California Natural Diversity Database (CNDDB) (2013) records of VELB occurrence in the study area (Plate 3.10-1 in the EIS/EIR). One hundred and six elderberry shrubs were identified during the spring and fall 2011–2013 surveys in the study area (Table F.2-1). Not all of these shrubs would be affected by the proposed project. VELB has potential to occur wherever elderberry shrubs sized 1 inch in diameter or more at ground level occur. For the most part stem counts were conducted only for shrubs that could be directly or indirectly affected by the proposed project. See the tables below (Table F.2-2 through Table F.2-6) and the impact discussion (Section 3.10.3) for the number of shrubs and stems directly and indirectly affected for each alternative.

Table F.2-1. Summary of Stem Counts for All Elderberry Shrubs In the Study Area

Shrub	Presence of Exit Holes?	Riparian Habitat?	Number of Stems (by Diameter) 1–3 Inches	3–5 Inches	>5 Inches	Comments
1	N	N	3	4	2	No impact
2	Y	Y	0	1	1	
3	Y	Y	13	5	5	
4	N	Y	19	2	2	
5	N	Y	18	0	1	
6	N	Y	60	5	9	
7	N	Y	33	10	18	
8	N	Y	8	5	2	
9	N	Y	30	2	8	
10	Y	Y	8	4	2	
11	–	Y	–	–	–	Covered in grapevines
12	–	Y	–	–	–	Covered in grapevines
13	–	Y	–	–	–	Covered with poison oak
14	–	Y	–	–	–	Covered with poison oak
15	–	Y	–	–	–	Covered with poison oak
16	Y	Y	1	1	2	
17	Y	Y	1	0	1	
18	Y	Y	3	0	2	
19	Y	Y	17	2	3	
20	Y	Y	11	1	1	
21	Y	Y	8	2	2	
22	–	Y	–	–	–	Covered in grapevines
23	N	Y	3	3	1	No impact
24	N	Y	18	7	7	
25	N	N	19	6	1	
26	N	N	18	2	0	
27	N	Y	9	0	2	Covered in blackberry brambles; best estimate of stems
28	N	Y	2	0	0	
29	–	–	–	–	–	No impact
30	Y	Y	0	0	1	
31	–	N	–	–	–	No Access
32	N	N	3	1	1	
33	–	N	–	–	–	No Access
34	Y	N	12	6	10	
35	N	N	9	1	8	
36	N	Y	0	0	1	
37	–	Y	–	–	–	Covered in blackberry and poison oak
38	–	Y	–	–	–	Covered in blackberry and poison oak
39a	N	N	3	0	0	
39b	–	N	–	–	–	Covered in blackberry and poison oak

Shrub	Presence of Exit Holes?	Riparian Habitat?	Number of Stems (by Diameter) 1–3 Inches	3–5 Inches	>5 Inches	Comments
40	–	–	–	–	–	No impact
41a	–	N	–	–	–	Covered in blackberry
41b	–	N	–	–	–	Covered in blackberry
41c	Y	N	5	7	2	
42	–	–	–	–	–	No impact
43	–	–	–	–	–	No impact
44a	–	–	–	–	–	No impact
44b	–	–	–	–	–	No impact
44c	–	–	–	–	–	No impact
44d	–	–	–	–	–	No impact
45	–	–	–	–	–	No impact
46	–	–	–	–	–	No impact
47	Y	Y	42	8	2	
48	–	–	–	–	–	No impact
49	N	N	0	0	1	
50	Y	N	16	7	7	
51	Y	N	14	4	7	
52	Y	Y	6	1	1	
53	Y	N	29	17	3	
54	N	Y	17	1	0	
55	–	–	–	–	–	No impact
56	–	–	–	–	–	No impact
57	–	–	–	–	–	No impact
58	–	–	–	–	–	No impact
59	–	–	–	–	–	No impact
60	–	–	–	–	–	No impact
61	–	–	–	–	–	No impact
62	–	–	–	–	–	No impact
63	–	–	–	–	–	No impact
64	N	Y	31	12	0	Best estimate of stem count; shrub surrounded by thick willow/ blackberry/ fennel
65	N	Y	2	2	4	Thick grapevine surrounding shrub, best estimate of stem count.
66	N	Y	38	12	7	
67	N	Y	10	12	4	
68	Y	Y	16	4	2	
69	–	Y	–	–	–	Impenetrable blackberry around most of the shrub
70	N	Y	6	3	2	
71	–	Y	–	v	–	Impenetrable blackberry around most of the shrub
72	Y	Y	5	2	5	

Shrub	Presence of Exit Holes?	Riparian Habitat?	Number of Stems (by Diameter) 1–3 Inches	3–5 Inches	>5 Inches	Comments
73	N	Y	3	0	2	
74	Y	Y	24	7	7	
75	N	Y	47	5	1	
76	Y	Y	12	3	2	
77	Y	Y	11	3	0	
78	Y	Y	13	3	9	
79	Y	Y	9	4	5	
80	–	Y	–	–	–	Impenetrable blackberry
81	–	Y	–	–	–	Impenetrable blackberry
82	–	Y	–	–	–	Impenetrable blackberry
83	–	Y	–	–	–	Impenetrable blackberry
84	–	Y	–	–	–	Impenetrable blackberry
85	–	Y	–	–	–	Impenetrable blackberry
86	–	Y	–	–	–	Impenetrable blackberry
87	–	–	–	–	–	No impact
88	–	Y	–	–	–	Impenetrable blackberry around the shrub
89	–	Y	–	–	–	Impenetrable blackberry around the shrub
90	–	Y	–	–	–	Impenetrable blackberry and poison oak around the shrub
91	–	Y	–	–	–	Impenetrable blackberry and poison oak around the shrub
92	N	Y	10	15	8	
93	–	Y	–	–	–	Impenetrable blackberry
94	–	Y	–	–	–	Impenetrable blackberry
95	–	Y	–	–	–	Impenetrable blackberry
96	–	Y	–	–	–	Covered in grapes and poison oak
97	Y	Y	3	0	1	
98	Y-	Y	4	0	0	
99	N	Y	1	0	0	No impact
100	Y	Y	8	2	0	

Table F.2-2. Summary of Stem Counts for All Elderberry Shrubs in Alternative 1

Shrub	Presence of Exit Holes?	Riparian Habitat?	Number of Stems (by Diameter) 1–3 Inches	3–5 Inches	>5 Inches	Effect on Shrub (Direct or Indirect)
3	Y	Y	13	5	5	Direct
4	N	Y	19	2	2	Direct
5	N	Y	18	0	1	Direct
6	N	Y	60	5	9	Direct
7	N	Y	33	10	18	Direct
8	N	Y	8	5	2	Direct
9	N	Y	30	2	8	Direct

Shrub	Presence of Exit Holes?	Riparian Habitat?	Number of Stems (by Diameter)			Effect on Shrub (Direct or Indirect)
			1–3 Inches	3–5 Inches	>5 Inches	
10	Y	Y	8	4	2	Direct
30	Y	Y	0	0	1	Direct
31 [1]	UNK	N	UNK	UNK	UNK	Direct
32	N	N	3	1	1	Direct
33 [1]	UNK	N	UNK	UNK	UNK	Direct
34	Y	N	12	6	10	Direct
35	N	N	9	1	8	Indirect
37 [2]	UNK	Y	UNK	UNK	UNK	Indirect
38 [2]	UNK	Y	UNK	UNK	UNK	Indirect
39a	N	N	3	0	0	Direct
39b [2]	UNK	N	UNK	UNK	UNK	Direct
41a [2]	UNK	N	UNK	UNK	UNK	Direct
41b [2]	UNK	N	UNK	UNK	UNK	Direct
41c	Y	N	5	7	2	Direct
49	N	N	0	0	1	Direct
50	Y	N	16	7	7	Direct
88 [2]	UNK	Y	UNK	UNK	UNK	Indirect
89 [2]	UNK	Y	UNK	UNK	UNK	Indirect
92 [2]	N	Y	10	15	8	Indirect
93 [2]	UNK	Y	UNK	UNK	UNK	Indirect
94 [2]	UNK	Y	UNK	UNK	UNK	Indirect
95 [2]	UNK	Y	UNK	UNK	UNK	Indirect
Indirect total			19	16	16	
Direct total			228	54	69	
Overall total			247	70	85	

[1] No property access.
[2] UNK = Unknown because shrubs covered in grapevines or poison oak and cannot count stems or see exit holes.

Table F.2-3. Summary of Stem Counts for All Elderberry Shrubs in Alternative 2

Shrub	Presence of Exit Holes?	Riparian Habitat?	Number of Stems (by Diameter)			Effect on Shrub (Direct or Indirect)
			1–3 Inches	3–5 Inches	>5 Inches	
3	Y	Y	13	5	5	Direct
4	N	Y	19	2	2	Direct
5	N	Y	18	0	1	Direct
6	N	Y	60	5	9	Direct
7	N	Y	33	10	18	Direct
8	N	Y	8	5	2	Direct
9	N	Y	30	2	8	Direct
10	Y	Y	8	4	2	Indirect
11 [1]	UNK	Y	UNK	UNK	UNK	Indirect
12 [1]	UNK	Y	UNK	UNK	UNK	Direct
13 [1]	UNK	Y	UNK	UNK	UNK	Direct

Shrub	Presence of Exit Holes?	Riparian Habitat?	Number of Stems (by Diameter)			Effect on Shrub (Direct or Indirect)
			1–3 Inches	3–5 Inches	>5 Inches	
14 [1]	UNK	Y	UNK	UNK	UNK	Direct
15 [1]	UNK	Y	UNK	UNK	UNK	Indirect
30	Y	Y	0	0	1	Indirect
31 [2]	UNK	N	UNK	UNK	UNK	Direct
32	N	N	3	1	1	Direct
33 [2]	UNK	N	UNK	UNK	UNK	Direct
34	Y	N	12	6	10	Direct
35	N	N	9	1	8	Direct
36	N	Y	0	0	1	Direct
37 [1]	UNK	Y	UNK	UNK	UNK	Direct
38 [1]	UNK	Y	UNK	UNK	UNK	Direct
39a	N	N	3	0	0	Direct
39b [1]	UNK	N	UNK	UNK	UNK	Direct
41a [1]	UNK	N	UNK	UNK	UNK	Direct
41b [1]	UNK	N	UNK	UNK	UNK	Direct
41c	Y	N	5	7	2	Direct
49	N	N	0	0	1	Direct
50	Y	N	16	7	7	Direct
52	Y	Y	6	1	1	Indirect
53	Y	N	29	17	3	Indirect
54	N	Y	17	1	0	Indirect
75	N	Y	47	5	1	Indirect
77	Y	Y	11	3	0	Indirect
84 [1]	UNK	Y	UNK	UNK	UNK	Indirect
85 [1]	UNK	Y	UNK	UNK	UNK	Indirect
88 [1]	UNK	Y	UNK	UNK	UNK	Direct
89 [1]	UNK	Y	UNK	UNK	UNK	Direct
90 [1]	UNK	Y	UNK	UNK	UNK	Direct
91[1]	UNK	Y	UNK	UNK	UNK	Direct
92	N	Y	10	15	8	Direct
93 [1]	UNK	Y	UNK	UNK	UNK	Direct
94 [1]	UNK	Y	UNK	UNK	UNK	Direct
95 [1]	UNK	Y	UNK	UNK	UNK	Direct
96[1]	UNK	Y	UNK	UNK	UNK	Direct
97	Y	Y	3	0	1	Direct
Indirect total			118	31	8	
Direct total			242	66	84	
Overall total			360	97	92	

[1] UNK = Unknown because shrubs covered in grapevines or poison oak and cannot count stems or see exit holes.
[2] No property access.

Table F.2-4. Summary of Stem Counts for All Elderberry Shrubs in Alternative 3

Shrub	Presence of Exit Holes?	Riparian Habitat?	Number of Stems (by Diameter)			Effect on Shrub (Direct or Indirect)
			1–3 Inches	3–5 Inches	>5 Inches	
3	Y	Y	13	5	5	Direct
4	N	Y	19	2	2	Direct
5	N	Y	18	0	1	Direct
6	N	Y	60	5	9	Direct
7	N	Y	33	10	18	Direct
8	N	Y	8	5	2	Direct
9	N	Y	30	2	8	Direct
10	Y	Y	8	4	2	Direct
11 [1]	UNK	Y	UNK	UNK	UNK	Direct
12 [1]	UNK	Y	UNK	UNK	UNK	Direct
13 [1]	UNK	Y	UNK	UNK	UNK	Direct
14 [1]	UNK	Y	UNK	UNK	UNK	Direct
15 [1]	UNK	Y	UNK	UNK	UNK	Direct
30	Y	Y	0	0	1	Indirect
31 [2]	UNK	N	UNK	UNK	UNK	Direct
32	N	N	3	1	1	Direct
33 [2]	UNK	N	UNK	UNK	UNK	Direct
34	Y	N	12	6	10	Direct
35	N	N	9	1	8	Indirect
36	N	Y	0	0	1	Indirect
41a [1]	UNK	N	UNK	UNK	UNK	Direct
41b [1]	UNK	N	UNK	UNK	UNK	Direct
41c	Y	N	5	7	2	Direct
49	N	N	16	7	7	Direct
50	Y	N	0	0	1	Direct
88 [1]	UNK	Y	UNK	UNK	UNK	Indirect
89 [1]	UNK	Y	UNK	UNK	UNK	Indirect
90 [1]	UNK	Y	UNK	UNK	UNK	Indirect
Indirect Total			9	1	10	
Direct Total			225	54	68	
Overall Total			234	55	78	

[1] UNK = Unknown because shrubs covered in grapevines or poison oak and cannot count stems or see exit holes.
[2] No property access.

Table F.2-5. Summary of Stem Counts for All Elderberry Shrubs in Alternative 4

Shrub	Presence of Exit Holes?	Riparian Habitat?	Number of Stems (by Diameter)			Effect on Shrub (Direct or Indirect)
			1–3 Inches	3–5 Inches	>5 Inches	
2	Y	Y	0	1	1	Indirect
3	Y	Y	13	5	5	Direct
4	N	Y	19	2	2	Direct
5	N	Y	18	0	1	Direct
6	N	Y	60	5	9	Direct
7	N	Y	33	10	18	Direct
8	N	Y	8	5	2	Direct
9	N	Y	30	2	8	Direct
10	Y	Y	8	4	2	Indirect
30	Y	Y	0	0	1	Indirect
31 [2]	UNK	N-	UNK	UNK	UNK	Direct
32	N	N	3	1	1	Direct
33 [2]	UNK	N	UNK	UNK	UNK	Direct
34	Y	N	12	6	10	Direct
37 [1]	UNK	Y	UNK	UNK	UNK	Indirect
38 [1]	UNK	Y	UNK	UNK	UNK	Indirect
39a	N	N	3	0	0	Direct
39b [1]	UNK	N	UNK	UNK	UNK	Direct
41a [1]	UNK	N	UNK	UNK	UNK	Direct
41b [1]	UNK	N	UNK	UNK	UNK	Direct
41c	Y	N	5	7	2	Direct
47	Y	Y	42	8	2	Indirect
49	N	N	16	7	7	Direct
50	Y	N	0	0	1	Direct
52	Y	Y	6	1	1	Indirect
53	Y	N	29	17	3	Direct
54	N	Y	17	1	0	Indirect
75	N	Y	47	5	1	Indirect
76	Y	Y	12	3	2	Indirect
77	Y	Y	11	3	0	Indirect
78	Y	Y	13	3	9	Indirect
79	Y	Y	9	4	5	Indirect
80 [1]	UNK	Y	UNK	UNK	UNK	Indirect
81 [1]	UNK	Y	UNK	UNK	UNK	Indirect
82 [1]	UNK	Y	UNK	UNK	UNK	Indirect
84 [1]	UNK	Y	UNK	UNK	UNK	Indirect
85 [1]	UNK	Y	UNK	UNK	UNK	Indirect
86 [1]	UNK	Y	UNK	UNK	UNK	Indirect
87 [1]	UNK	Y	UNK	UNK	UNK	Indirect
92	N	Y	10	15	8	Indirect
93 [1]	UNK	Y	UNK	UNK	UNK	Indirect
94 [1]	UNK	Y	UNK	UNK	UNK	Indirect

Shrub	Presence of Exit Holes?	Riparian Habitat?	Number of Stems (by Diameter)			Effect on Shrub (Direct or Indirect)
			1–3 Inches	3–5 Inches	>5 Inches	
95 [1]	UNK	Y	UNK	UNK	UNK	Indirect
97	Y	Y	3	0	1	Direct
98	UNK	Y	4	0	0	Indirect
100	Y	Y	8	2	0	Indirect
Indirect Total			187	50	32	
Direct Total			252	67	70	
Overall Total			439	117	102	

[1] UNK = Unknown because shrubs covered in grapevines or poison oak and can't count stems or see exit holes.
[2] No property access.

Table F.2-6. Summary of Stem Counts for All Elderberry Shrubs in Alternative 5

Shrub	Presence of Exit Holes?	Riparian Habitat?	Number of Stems (by Diameter)			Effect on Shrub (Direct or Indirect)
			1–3 Inches	3–5 Inches	>5 Inches	
2	Y	Y	0	1	1	Indirect
3	Y	Y	13	5	5	Direct
4	N	Y	19	2	2	Direct
5	N	Y	18	0	1	Direct
6	N	Y	60	5	9	Direct
7	N	Y	33	10	18	Direct
8	N	Y	8	5	2	Direct
9	N	Y	30	2	8	Direct
10	Y	Y	8	4	2	Indirect
30	Y	Y	0	0	1	Indirect
31 [2]	UNK	N	UNK	UNK	UNK	Direct
32	N	N	3	1	1	Direct
33 [2]	UNK	N	UNK	UNK	UNK	Direct
37 [1]	UNK	Y	UNK	UNK	UNK	Indirect
38 [1]	UNK	Y	UNK	UNK	UNK	Indirect
39a	N	N	3	0	0	Direct
39b [1]	UNK	N	UNK	UNK	UNK	Direct
41a [1]	UNK	N	UNK	UNK	UNK	Direct
41b [1]	UNK	N	UNK	UNK	UNK	Direct
41c	Y	N	5	7	2	Direct
47	Y	Y	42	8	2	Indirect
49	N	N	0	0	1	Direct
50	Y	N	16	7	7	Direct
52	Y	Y	6	1	1	Indirect
53	Y	N	29	17	3	Direct
54	N	Y	17	1	0	Indirect
75	N	Y	47	5	1	Indirect
76	Y	Y	12	3	2	Indirect
77	Y	Y	11	3	0	Indirect

Shrub	Presence of Exit Holes?	Riparian Habitat?	Number of Stems (by Diameter)			Effect on Shrub (Direct or Indirect)
			1–3 Inches	3–5 Inches	>5 Inches	
78	Y	Y	13	3	9	Indirect
79	Y	Y	9	4	5	Indirect
80 [1]	UNK	Y	UNK	UNK	UNK	Indirect
81 [1]	UNK	Y	UNK	UNK	UNK	Indirect
82 [1]	UNK	Y	UNK	UNK	UNK	Indirect
84 [1]	UNK	Y	UNK	UNK	UNK	Indirect
85 [1]	UNK	Y	UNK	UNK	UNK	Indirect
86 [1]	UNK	Y	UNK	UNK	UNK	Indirect
87 [1]	UNK	Y	UNK	UNK	UNK	Indirect
92	N	Y	10	15	8	Indirect
93 [1]	UNK	Y	UNK	UNK	UNK	Indirect
94 [1]	UNK	Y	UNK	UNK	UNK	Indirect
95 [1]	UNK	Y	UNK	UNK	UNK	Indirect
97	Y	Y	3	0	1	Direct
98	UNK	Y	4	0	0	Indirect
100	Y	Y	8	2	0	Indirect
Indirect Total			187	50	32	
Direct Total			240	61	60	
Overall Total			380	111	92	

[1] UNK = Unknown because shrubs covered in grapevines or poison oak and cannot count stems or see exit holes.
[2] No property access.

F.2.2 Giant Garter Snake

The giant garter snake is listed as threatened under the ESA and the California Endangered Species Act (CESA). The giant garter snake is the largest garter snake, reaching a total length of 64 inches or more. Dorsal background coloration varies from brownish to olive with a checkered pattern of black spots, separated by a yellow dorsal stripe and two light-colored lateral stripes. (U.S. Fish and Wildlife Service 1999b.)

Giant garter snakes are endemic to wetlands in the Sacramento and San Joaquin Valleys and inhabit marshes, sloughs, ponds, small lakes, low-gradient streams and other waterways, and agricultural wetlands such as irrigation and drainage canals and rice fields, as well as the adjacent uplands. Essential habitat components are:

- Adequate water during the species' active season (early spring through mid-fall) to provide food and cover.
- Emergent herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat during the active season.
- Upland habitat with grassy banks and openings in waterside vegetation for basking.

- Higher-elevation uplands for cover and refuge from floodwaters during the dormant season in winter. (U.S. Fish and Wildlife Service 1999b.)

The giant garter snake is extremely aquatic and rarely found away from water. Giant garter snakes actively forage in the water and retreat to water to escape from predators and when disturbed. The predominant prey species are crayfish, carp (*Cyprinus carpio*), mosquitofish (*Gambusia affinis*), bullfrogs, and Pacific tree frogs. Giant garter snakes are typically absent from larger rivers and other water bodies that support introduced populations of large predatory fish and from wetlands with sand, gravel, or rock substrates. Riparian woodlands do not typically provide suitable habitat because of excessive shade, lack of basking sites, and absence of prey populations. (U.S. Fish and Wildlife Service 1999b.)

Giant garter snakes hibernate in small mammal burrows and other soil crevices located near aquatic habitat above prevailing flood levels throughout the winter months (November until early spring). They typically select burrows with sunny exposure along south- and west-facing slopes. Giant garter snakes also use burrows as refuge from extreme heat during their active period. The U.S. Geological Survey (USGS) Biological Resources Division has documented giant garter snakes using burrows in summer as much as 165 feet away from the marsh edge. Overwintering giant garter snakes have been documented using burrows as far as 820 feet from the edge of marsh habitat (U.S. Fish and Wildlife Service 1999b).

F.2.2.1 Status in the Project Area

There are no CNDDB (2013) records for giant garter snakes in the project area, although there are 55 occurrences within 10 miles of the project area. No giant garter snakes were observed during the April and May 2011 reconnaissance-level surveys, but this does not eliminate the possibility that they inhabit the site. The project area is within the current range of giant garter snake (U.S. Fish and Wildlife Service 1999b). The closest reported occurrence of giant garter snake is approximately 3 miles west of the project area in the Yolo Bypass (California Natural Diversity Database 2013).

In the project area, the Main Drain and several agricultural ditches, Bees Lakes, and emergent marshes provide suitable aquatic habitat for giant garter snake (Plate 3.10-1 in the EIS/EIR). Water is pumped into the Main Canal from the Sacramento River and then flows into several adjoining irrigation ditches that are used to irrigate agricultural fields in the project area. The flow of water through these ditches is variable and depends on the need for irrigation water. Most of the canals in the project area were wet at the time of the April and May 2011 surveys. The supply of irrigation water to many of these ditches was terminated after the land was recently sold. Most of the active fields in the project area during the spring 2011 survey were planted in wheat that does not require irrigation.

Upland basking and overwintering habitat is also present in the project area. Upland habitat consists of nonnative annual grasslands along the irrigation ditches and adjacent fallow agricultural lands within 200 feet of suitable aquatic habitat.

F.2.3 Western Pond Turtle

The western pond turtle is a California species of special concern. The western pond turtle is the only abundant turtle native to California (California Department of Fish and Game 2005). It was

found historically in most Pacific slope drainages between the Oregon and Mexican borders. It is still found in suitable habitats west of the Sierra-Cascade crest (Jennings and Hayes 1994).

Western pond turtles require some slow-water aquatic habitat and are uncommon in high-gradient streams (Jennings and Hayes 1994). The banks of inhabited waters usually have thick vegetation, but basking sites such as logs, rocks, or open banks also must be present (California Department of Fish and Game 2005). Depending on the latitude, elevation, and habitat type, the western pond turtle may become inactive over winter or remain active year-round. Nest sites typically are found on slopes that are unshaded and have high clay or silt composition (Jennings and Hayes 1994). Eggs are laid from March to August, depending on local conditions, and incubation lasts from 73 to 80 days. Western pond turtles are omnivorous and feed on aquatic plant material, aquatic invertebrates, fishes, frogs, and even carrion (California Department of Fish and Game 2005).

F.2.3.1 Status in the Project Area

There are no CNDDB (2013) occurrences of this species in the project area. There are six CNDDB (2013) records for western pond turtle occurrences within a 10-mile radius of the project area. Fifteen western pond turtles were observed during the 2011 field survey in Bees Lakes in the project area (Plate 3.10-1 in the EIS/EIR). Up to 38 basking turtles were observed in Bees Lakes during the March 26, 2013 survey. The 38 turtles were a mixed group of western pond turtles (4) and red-eared sliders (6) with the 28 remaining turtles unidentified because of thick coatings of vegetation on their shells and heads. Red-eared sliders are a non-native species which may outcompete for basking sites and food sources with pond turtles, and may also spread diseases. (Holland 1994). Open water (including agricultural ditches and ponds) and emergent wetland habitats provide suitable aquatic habitat; annual grassland, riparian forest, and other upland areas adjacent to aquatic habitats provide potential winter hibernacula and nesting habitat.

F.2.4 Swainson's Hawk

Swainson's hawks are protected under the Migratory Bird Treaty Act (MBTA) and are state-listed as threatened. Swainson's hawks inhabit grasslands, sage-steppe plains, and agricultural regions of western North America during the breeding season and winter in grassland and agricultural regions from central Mexico to southern South America (England et al. 1997).

In California, the nesting distribution includes the Sacramento and San Joaquin Valleys, the Great Basin sage-steppe communities and associated agricultural valleys in extreme northeastern California, isolated valleys in the Sierra Nevada in Mono and Inyo Counties, and limited areas of the Mojave Desert region (California Department of Fish and Game 1994).

Since 1980, based on nesting records alone, populations in California appear relatively stable. However, continued agricultural conversion and practices, urban development, and water development have reduced available habitat for Swainson's hawks throughout their range in California; this habitat reduction potentially could result in a long-term declining trend. The status of populations, particularly with respect to juvenile survivorship, remains unclear.

In California, Swainson's hawk habitat generally consists of large, flat, open, undeveloped landscapes that include suitable grassland or agricultural foraging habitat and sparsely distributed trees for nesting (England et al. 1997). Foraging habitat includes open fields and pastures. Preferred foraging

habitats for Swainson's hawk include alfalfa fields, fallow fields, low-growing row or field crops, rice fields during the nonflooded period, and cereal grain crops. Prey species include ground squirrels, California voles, pocket gophers, deer mice, reptiles, and insects (Swainson's Hawk Technical Advisory Committee2000; England et al. 1997).

Swainson's hawks usually nest in large native trees such as valley oak, cottonwood, and willows, although nonnative trees such as eucalyptus (*Eucalyptus* spp.) occasionally are used. Nests occur in riparian woodlands, roadside trees, trees along field borders, isolated trees and small groves, trees in windbreaks, and trees on the edges of remnant oak woodlands. In some locales, urban nest sites have been recorded. The breeding season is typically March to August (England et al. 1997).

F.2.4.1 Status in the Project Area

There are four nest locations in the project area and an additional 11 nests within 1 mile, 56 nests within 5 miles, and 147 nests within 10 miles of the project area (California Natural Diversity Database 2013) (Plate 3.10-1 in the EIS/EIR). Not all of these nests would be active in a given year because hawks can use different nest site locations. Therefore, it is difficult to determine the population numbers in the project area. Several adult Swainson's hawks were observed foraging in the project area during the reconnaissance surveys in April and May 2011. Large trees located in and adjacent to the project area provide suitable nesting habitat, and agricultural lands and grasslands provide suitable foraging habitat.

F.2.5 Western Burrowing Owl

Western burrowing owls are a California species of special concern and are protected under the MBTA. Western burrowing owls were formerly a common permanent resident throughout much of California, but population declines became noticeable by the 1940s and have continued to the present. Farming has taken a major toll on western burrowing owl populations and their habitat by destroying nesting burrows and exposing breeders and their young to the toxic effects of pesticides. (Haug et al. 1993.)

Western burrowing owls prefer open, dry, short grassland habitats with few trees and are often associated with burrowing mammals such as California ground squirrels. They occupy burrows typically abandoned by ground squirrels or other burrowing mammals but also may use artificial burrows such as abandoned pipes, culverts, and debris piles (California Department of Fish and Game 2012; Haug et al. 1993). Prey includes arthropods, amphibians, small reptiles, small mammals, and birds, particularly horned larks (Haug et al. 1993).

The breeding season usually extends from late February through August. Western burrowing owls often nest in roadside embankments, on levees, and along irrigation canals. This species is more diurnal than most owls and often can be observed during the day standing outside the entrance to its burrow. (Haug et al. 1993.)

F.2.5.1 Status in the Project Area

There are no CNDDB (2013) occurrences of this species in the project area. There are 68 occurrences within a 10-mile radius of the project area CNDDB (2013). The closest of these include nesting records located along the DWSC and the northwest corner of Sacramento Executive Airport.

The ruderal fields, levees, and irrigation ditches provide suitable nesting habitat where ground squirrel burrows are present, and open areas near suitable nesting habitat provide suitable foraging habitat.

F.2.6 White-Tailed Kite

The white-tailed kite is protected under the MBTA and is a fully protected species under the California Fish and Game Code (CFGC). White-tailed kites were threatened with extinction in North America during the early twentieth century. Populations recovered throughout the species' range in the United States from small populations that survived in California, Texas, and Florida. However, since the 1980s, white-tailed kite populations have been declining, apparently because of loss of habitat and increased disturbance of nests. (Dunk 1995.)

The breeding season generally extends from early February through early August. White-tailed kites usually nest in large native trees, although nonnative trees also are used occasionally. Nest trees are generally at the edge of wooded habitat next to open fields. Large trees in developed areas also may be used, although the trees need to be close to open fields for foraging (Dunk 1995). White-tailed kites feed primarily on small mammals, including voles (*Microtus* sp.), pocket mice (*Perognathus* sp.), and western harvest mice (*Reithrodontomys megalotis*).

F.2.6.1 Status in the Project Area

There are no CNDDB (2013) occurrences of this species in the project area. CNDDB (2013) records indicate 20 white-tailed kite nesting occurrences within 10 miles of the project area. Large trees in and adjacent to the project area provide suitable nesting habitat, and agricultural fields and other open areas provide suitable foraging habitat. A white-tailed kite was observed perched on a tree in the project area during the March 26, 2013 field survey.

F.2.7 Loggerhead Shrike

The loggerhead shrike (*Lanius ludovicianus*) is designated as a California species of special concern. Loggerhead shrikes are a widespread species in North America, occurring from the southern Canadian provinces across most of the United States into Mexico (Yosef 1996). In California, loggerhead shrikes occur in open habitats with scattered shrubs, trees, posts, fences, utility lines, and other perches. Habitats include valley foothill forests, pinyon-juniper, desert riparian, and Joshua tree habitats (California Department of Fish and Game 2005). Loggerhead shrikes are adaptable to urban environments as long as preferred habitat characteristics and abundant prey supplies are present (Yosef 1996).

The loggerhead shrike is a predatory songbird. As opportunistic predators, loggerhead shrikes feed on a wide variety of prey, including insects, small mammals and birds, reptiles, amphibians, and occasionally carrion. Prey is often impaled on sharp objects such as thorns and barbed wire fences (Yosef 1996). Nesting habitat includes dense-foliage shrubs and trees near open habitats (California Department of Fish and Game 2005).

F.2.7.1 Status in the Project Area

CNDDB (2013) records do not indicate any loggerhead shrike occurrences within 10 miles of the project area. Shrikes could nest in riparian and valley oak woodlands as well as in landscape shrubs throughout the project area.

F.2.8 Tricolored Blackbird

The tricolored blackbird is a California species of special concern. In California, active breeding colonies occur in 46 California counties, with the largest colonies in the Central Valley. In the Central Valley, breeding extends east into the foothills of the Sierra Nevada. Historically, most California colonies have been located in the Sacramento and San Joaquin Valleys, but habitat loss has reduced breeding considerably in this area in recent years (Beedy and Hamilton 1999). Tricolored blackbirds have three basic requirements for selecting their breeding colonies: open, accessible water; a protected nesting substrate, including either flooded vegetation or thorny/spiny vegetation; and a suitable foraging space providing adequate insect prey within a few miles of the nesting colony. They often change their nest locations from year to year. An increasing percentage of tricolored blackbirds are using Himalayan blackberry for nesting habitat (Beedy and Hamilton 1999).

Suitable breeding habitats within the Central Valley have been found to include emergent marsh areas with tules or cattail and upland habitats consisting of thistle, nettle, blackberry, wheat, and other shrubby upland substrates (Meese 2006). Foraging habitats in all seasons include annual grasslands, wet and dry vernal pools and other seasonal wetlands, agricultural fields (e.g., large tracts of alfalfa with continuous mowing schedules and recently tilled fields), cattle feedlots, and dairies. Tricolored blackbirds also occasionally forage in riparian scrub habitats and along marsh borders. Weed-free row crops and intensively managed vineyards and orchards do not serve as regular forage sites (Beedy and Hamilton 1999).

F.2.8.1 Status in the Project Area

There are no CNDDB (2013) occurrences of this species in the project area. CNDDB (2013) indicated 13 nesting sites within a 10-mile radius. Emergent wetlands and Himalayan blackberry brambles (which occur throughout the project area) provide suitable nesting habitat, and agricultural fields and annual grasslands provide suitable foraging habitat.

F.2.9 Purple Martin

Purple martin is a California species of special concern. This species breeds locally along eastern slopes of the Cascade Mountains of California south to extreme southwestern California. The species winters in South America in lowlands east of the Andes south to northern Argentina (rarely) and southern Brazil. Purple martin is the largest swallow in North America and among the largest in the world. These martins inhabit montane forest or Pacific lowlands, restricted to areas with dead snags containing woodpecker holes, generally patchy and local in occurrence. This species is reported typically to avoid deserts and grasslands. (Brown 1997.)

Purple martin is a diurnal, aerial feeder that feeds on insects at higher elevations than other swallows, sometimes up to 490 feet. Because of the height of foraging, individuals rarely are observed foraging, with the exception being late afternoons and near dusk when birds feed low and close to nest sites. The species presumably ranges over areas immediately surrounding the nest site, although there is no information on typical travel distance while foraging. Cold, rainy weather in spring forces purple martins, especially migrants, to feed low over ponds and lakes, apparently in pursuit of aquatic insects along the water surface. (Brown 1997.)

F.2.9.1 Status in the Project Area

There are no CNDDB (2013) occurrences of this species in the project area. There are 10 occurrences reported within a 10-mile radius of colonies nesting under freeway or street overpasses. Suitable nesting habitat for this species occurs in the riparian forest and other woodland and forest areas throughout the project area.

F.2.10 Bank Swallow

The bank swallow is a state-listed threatened species. In California, bank swallow is a regular breeder from Monterey County to San Francisco County, and in northern California in Siskiyou, Shasta, and Lassen Counties and along the Sacramento River from Shasta County south to Yolo County. Bank swallows nest in erodible soils on vertical or near-vertical banks and bluffs in lowland areas dominated by rivers, streams, lakes, and oceans. Based on the often ephemeral nature of nesting areas, bank swallow has low nest site fidelity. Foraging habitats surrounding nesting colony sites include wetlands, open water, grasslands, riparian forests, agricultural lands, shrublands, and occasionally upland woodlands. (Garrison 1999.)

Bank swallow is an aerial feeder from dawn to dusk that takes flying or jumping insects almost exclusively on the wing. The species is reported occasionally to eat terrestrial and aquatic insects or larvae and less often to consume vegetable matter. Bank swallow may feed on the ground where high concentrations of suitable insect prey are present. (Garrison 1999.)

F.2.10.1 Status in the Project Area

There are no CNDDB (2013) occurrences of this species in the project area. There is one nesting record for this species approximately 5 miles from the project area along the American River. Additionally, this species is recorded to nest approximately 12 miles north of the project area along the Sacramento River. In the project area, suitable breeding habitat includes areas along the Sacramento River where banks are vertical to near-vertical.

F.2.11 Northern Harrier

The northern harrier is a California species of special concern and is protected under the MBTA and CFGC 3503 and 3503.5. The northern harrier is a medium-sized hawk raptor of upland grasslands and fresh- and saltwater marshes. In California, northern harriers are a permanent resident of the northeastern plateau, coastal areas, and Central Valley (Macwhirter and Bildstein 1996). Northern

harriers breed in California in the Central Valley and Sierra Nevada (California Department of Fish and Game 2005).

Northern harriers frequent meadows, grasslands, desert sinks, open rangelands, and fresh- and saltwater emergent wetlands; they seldom are found associated with wooded habitats. Harriers feed mostly on voles and other small mammals, birds, frogs, small reptiles, crustaceans, insects, and rarely on fish (California Department of Fish and Game 2005). Harriers mostly nest in emergent wetland or along rivers or lakes but may nest in grasslands, grain fields, or sagebrush flats several miles from water (Macwhirter and Bildstein 1996). The nest is built of a large mound of sticks on wet areas and a smaller cup of grasses on dry sites.

F.2.11.1 Status in the Project Area

There are no CNDDB (2013) occurrences of this species nesting in the project area. Similarly, CNDDB (2013) records do not indicate any nesting northern harrier occurrences within 10 miles of the project area. Non-orchard agricultural fields and annual grasslands provide suitable foraging habitat, and the annual grassland, irrigated pasture, and emergent wetland habitat in the project area provide suitable nesting and foraging habitat.

F.2.12 Hoary Bat

The hoary bat is a California species of special concern and has been classified as moderate priority by the Western Bat Working Group (WBWG). The *moderate priority* designation indicates a level of concern that should warrant closer evaluation, more research, and conservation actions for the species. Hoary bats are found primarily in forested habitats, including riparian forests, and may occur in park and garden settings in urban areas (Brown and Pierson 1996). Habitats that are suitable for providing maternity roosts include all woodlands that have medium- to large-sized trees with dense foliage. Females and young tend to roost at higher sites in trees (California Department of Fish and Game 2005).

F.2.12.1 Status in the Project Area

There are no CNDDB (2013) occurrences of this species in the project area. CNDDB (2013) records indicate two hoary bat observations within 10 miles of the project area. Suitable habitat in the project area occurs in riparian forests and other forests and woodlands.

F.2.13 Western Red Bat

Western red bat is a California species of special concern and a WBWG high priority species. The *high priority* designation is for species at high risk of imperilment. The western red bat occurs throughout much of California at lower elevations. It is found primarily in riparian and wooded habitats but also occurs seasonally in urban areas (Brown and Pierson 1996). Western red bats roost in the foliage of trees that often are located on the edge of habitats adjacent to streams, fields, or urban areas. This species breeds in August and September, and young are born in May through July (Zeiner et al. 1990b).

F.2.13.1 Status in the Project Area

There are no occurrences of this species in the project area or within a 10-mile radius (CNDDB 2013). There are recent acoustical records for western red bat heard during maternity season in riparian habitat along the Sacramento River in West Sacramento (ICF International 2011). Suitable habitat in the project area occurs in riparian forests and other forests and woodlands.

F.2.14 Pallid Bat

The pallid bat is a California species of special concern and is designated as high priority by the WBWG. Pallid bats are found in a variety of habitats but are associated particularly with oak woodlands, ponderosa pine, redwood, and sequoia habitats in central and northern California. Pallid bats have a high reliance on trees for day roosts. (Brown and Pierson 1996.)

F.2.14.1 Status in the Project Area

There are no CNDDB (2013) occurrences of this species in the project area. CNDDB (2013) records indicate one pallid bat observation within 10 miles of the project area. Suitable habitat in the project area occurs in riparian forests and other forests and woodland.

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Appendix F.3

USFWS, CNPS, and CNDDB Species Lists

United States Department of the Interior

Department of the Interior logo

FISH AND WILDLIFE SERVICE

Fish & Wildlife Service logo

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

July 15, 2011

Document Number: 110715125143

Stephanie Myers
ICF International
630 K Street
Sacramento, CA 95814

Subject: Species List for Southport Levee Project

Dear: Ms. Myers

We are sending this official species list in response to your July 15, 2011 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be October 13, 2011.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found at file:///U:/branches.htm.

Endangered Species Division

Take Pride in America

These buttons will not appear on your list.

Revise Selection

Print this page

Print species list before going on to letter.

Make Official Letter

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 110715010311

Database Last Updated: April 29, 2010

No quad species lists requested.

County Lists

Yolo County

Listed Species

Invertebrates

- Branchinecta conservatio
  - Conservancy fairy shrimp (E)
- Branchinecta lynchi
  - vernal pool fairy shrimp (T)
- Desmocerus californicus dimorphus
  - valley elderberry longhorn beetle (T)
- Lepidurus packardi
  - Critical habitat, vernal pool tadpole shrimp (X)
  - vernal pool tadpole shrimp (E)

Fish

- Acipenser medirostris
  - green sturgeon (T) (NMFS)

- Hypomesus transpacificus
  - Critical habitat, delta smelt (X)
  - delta smelt (T)

- Oncorhynchus mykiss
  - Central Valley steelhead (T) (NMFS)
  - Critical habitat, Central Valley steelhead (X) (NMFS)

- Oncorhynchus tshawytscha
  - Central Valley spring-run chinook salmon (T) (NMFS)
  - Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
  - Critical habitat, winter-run chinook salmon (X) (NMFS)
  - winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

- Ambystoma californiense
  - California tiger salamander, central population (T)
  - Critical habitat, CA tiger salamander, central population (X)

- Rana draytonii
  - California red-legged frog (T)

Reptiles

- Thamnophis gigas
  - giant garter snake (T)

Birds

- Strix occidentalis caurina
  - northern spotted owl (T)

Plants

- Cordylanthus palmatus
  - palmate-bracted bird's-beak (E)

- Neostapfia colusana

  - Colusa grass (T)
  - Critical habitat, Colusa grass (X)

- Tuctoria mucronata
  - Critical habitat, Solano grass (=Crampton's tuctoria) (X)
  - Solano grass (=Crampton's tuctoria) (E)

Candidate Species

Birds

- Coccyzus americanus occidentalis
  - Western yellow-billed cuckoo (C)

Key:

- (E) Endangered - Listed as being in danger of extinction.
- (T) Threatened - Listed as likely to become endangered within the foreseeable future.
- (P) Proposed - Officially proposed in the Federal Register for listing as endangered or threatened.
- (NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.
- Critical Habitat - Area essential to the conservation of a species.
- (PX) Proposed Critical Habitat - The species is already listed. Critical habitat is being proposed for it.
- (C) Candidate - Candidate to become a proposed species.
- (V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
- (X) Critical Habitat designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, or may be affected by projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list.
See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.
- During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.
- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.
- Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this

on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6520.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be October 13, 2011.

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the SACRAMENTO WEST (513D) U.S.G.S. 7 1/2 Minute Quad

Database last updated: September 18, 2011
Report Date: September 25, 2012

Listed Species

Invertebrates

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Hypomesus transpacificus
Critical habitat, delta smelt (X)
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
Critical habitat, winter-run chinook salmon (X) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Thamnophis gigas
giant garter snake (T)

Birds

Vireo bellii pusillus
Least Bell's vireo (E)

Key:

- (E) Endangered - Listed as being in danger of extinction.
- (T) Threatened - Listed as likely to become endangered within the foreseeable future.
- (P) Proposed - Officially proposed in the Federal Register for listing as endangered or threatened.
- (NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.
- Critical Habitat - Area essential to the conservation of a species.
- (PX) Proposed Critical Habitat - The species is already listed. Critical habitat is being proposed for it.
- (C) Candidate - Candidate to become a proposed species.
- (V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
- (X) Critical Habitat designated for this species

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

January 3, 2013

Document Number: 130103032349

Stephanie Myers
ICF International
630 K Street, Suite 400
Sacramento, CA 95814

Subject: Species List for Southport Sacramento River Early Implementation Project

Dear: Ms. Myers

We are sending this official species list in response to your January 3, 2013 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be April 03, 2013.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found here.

Endangered Species Division

TAKE PRIDE IN AMERICA

U.S. Fish & Wildlife Service
Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 130103032349

Database Last Updated: September 18, 2011

No quad species lists requested.

County Lists

Yolo County

Listed Species

Invertebrates

Branchinecta conservatio
Conservancy fairy shrimp (E)

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Elaphrus viridis
delta green ground beetle (T)

Lepidurus packardi
Critical habitat, vernal pool tadpole shrimp (X)
vernal pool tadpole shrimp (E)

Syncaris pacifica
California freshwater shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Hypomesus transpacificus
Critical habitat, delta smelt (X)
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
Critical habitat, winter-run chinook salmon (X) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)
Critical habitat, CA tiger salamander, central population (X)

Rana draytonii
California red-legged frog (T)

Reptiles

Thamnophis gigas
giant garter snake (T)

Birds

Charadrius alexandrinus nivosus
western snowy plover (T)

Strix occidentalis caurina
northern spotted owl (T)

Vireo bellii pusillus
Least Bell's vireo (E)

Plants

Cordylanthus palmatus
palmate-bracted bird's-beak (E)

Neostapfia colusana
Colusa grass (T)
Critical habitat, Colusa grass (X)

Sidalcea keckii
Keck's checker-mallow (=checkerbloom) (E)

Tuctoria mucronata
Critical habitat, Solano grass (=Crampton's tuctoria) (X)
Solano grass (=Crampton's tuctoria) (E)

Candidate Species

Birds

Coccyzus americanus occidentalis
Western yellow-billed cuckoo (C)

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6520.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be April 03, 2013.

Inventory of Rare and Endangered Plants

v7-11jun 6-9-11

Status: search results - Wed, Jul. 6, 2011, 16:41 b

{QUADS_123} =~ m/513D|497A|497B|512B|512C|496B|513A|513B|513C/

Search

Tip: Want to search by county? Try the **county index**.[all tips and help.][search history]

Your Quad Selection: Sacramento West (513D) 3812155, Clarksburg (497A) 3812145, Saxon (497B) 3812146, Rio Linda (512B) 3812164, Sacramento East (512C) 3812154, Florin (496B) 3812144, Taylor Monument (513A) 3812165, Grays Bend (513B) 3812166, Davis (513C) 3812156

Hits 1 to 19 of 19

Requests that specify topo quads will return only Lists 1-3.

To save selected records for later study, click the ADD button.

ADD checked items to Plant Press | check all | check none

Selections will appear in a new window.

open	save	hits	scientific	common	family	CNPS
		1	**Astragalus tener var. ferrisiae**	Ferris' milk-vetch	Fabaceae	List 1B.1
		1	**Astragalus tener var. tener**	alkali milk-vetch	Fabaceae	List 1B.2
		1	**Atriplex cordulata**	heartscale	Chenopodiaceae	List 1B.2
		1	**Atriplex depressa**	brittlescale	Chenopodiaceae	List 1B.2
		1	**Atriplex joaquiniana**	San Joaquin spearscale	Chenopodiaceae	List 1B.2
		1	**Chloropyron palmatum**	palmate-bracted bird's-beak	Orobanchaceae	List 1B.1
		1	**Downingia pusilla**	dwarf downingia	Campanulaceae	List 2.2

		1	**Gratiola heterosepala**	Boggs Lake hedge-hyssop	Plantaginaceae	List 1B.2
		1	**Hibiscus lasiocarpos var. occidentalis**	woolly rose-mallow	Malvaceae	List 1B.2
		1	**Juglans hindsii**	Northern California black walnut	Juglandaceae	List 1B.1
		1	**Legenere limosa**	legenere	Campanulaceae	List 1B.1
		1	**Lepidium latipes var. heckardii**	Heckard's pepper-grass	Brassicaceae	List 1B.2
		1	**Lilaeopsis masonii**	Mason's lilaeopsis	Apiaceae	List 1B.1
		1	**Myosurus minimus ssp. apus**	little mousetail	Ranunculaceae	List 3.1
		1	**Navarretia leucocephala ssp. bakeri**	Baker's navarretia	Polemoniaceae	List 1B.1
		1	**Neostapfia colusana**	Colusa grass	Poaceae	List 1B.1
		1	**Sagittaria sanfordii**	Sanford's arrowhead	Alismataceae	List 1B.2
		1	**Symphyotrichum lentum**	Suisun Marsh aster	Asteraceae	List 1B.2
		1	**Tuctoria mucronata**	Crampton's tuctoria or Solano grass	Poaceae	List 1B.1

To save selected records for later study, click the ADD button.

ADD checked items to Plant Press | check all | check none

Selections will appear in a new window.

No more hits.

CNPS Inventory of Rare and Endangered Plants

Status: Plant Press Manager window with 23 items - Tue, Sep. 25, 2012 19:04 c

- During each visit, we provide you with an empty "Plant Press" for collecting items of interest.
- Several report formats are available. Use the CSV and XML options to download raw data.

Reformat list as: Standard List - with Plant Press controls

DELETE unchecked items | check all | check none

open	save	scientific	common	family	CNPS
	☑	**Astragalus tener var. ferrisiae**	Ferris' milk-vetch	Fabaceae	List 1B.1
	☑	**Astragalus tener var. tener**	alkali milk-vetch	Fabaceae	List 1B.2
	☑	**Atriplex cordulata var. cordulata**	heartscale	Chenopodiaceae	List 1B.2
	☑	**Atriplex depressa**	brittlescale	Chenopodiaceae	List 1B.2
	☑	**Atriplex joaquinana**	San Joaquin spearscale	Chenopodiaceae	List 1B.2
	☑	**Carex comosa**	bristly sedge	Cyperaceae	List 2.1
	☑	**Chloropyron palmatum**	palmate-bracted bird's-beak	Orobanchaceae	List 1B.1
	☑	**Cuscuta obtusiflora var. glandulosa**	Peruvian dodder	Convolvulaceae	List 2.2
	☑	**Downingia pusilla**	dwarf downingia	Campanulaceae	List 2.2
	☑	**Gratiola heterosepala**	Boggs Lake hedge-hyssop	Plantaginaceae	List 1B.2
	☑	**Hibiscus lasiocarpos var. occidentalis**	woolly rose-mallow	Malvaceae	List 1B.2
	☑	**Juglans hindsii**	Northern California black walnut	Juglandaceae	List 1B.1
	☑	**Legenere limosa**	legenere	Campanulaceae	List 1B.1
	☑	**Lepidium latipes var. heckardii**	Heckard's pepper-grass	Brassicaceae	List 1B.2
	☑	**Lilaeopsis masonii**	Mason's lilaeopsis	Apiaceae	List 1B.1
	☑	**Myosurus minimus ssp. apus**	little mousetail	Ranunculaceae	List 3.1
	☑	**Navarretia leucocephala ssp. bakeri**	Baker's navarretia	Polemoniaceae	List 1B.1
	☑	**Neostapfia colusana**	Colusa grass	Poaceae	List 1B.1
	☑	**Plagiobothrys hystriculus**	bearded popcorn-flower	Boraginaceae	List 1B.1
	☑	**Sagittaria sanfordii**	Sanford's arrowhead	Alismataceae	List 1B.2
	☑	**Symphyotrichum lentum**	Suisun Marsh aster	Asteraceae	List 1B.2
	☑	**Trifolium hydrophilum**	saline clover	Fabaceae	List 1B.2

	Tuctoria mucronata	Crampton's tuctoria or Solano grass	Poaceae	List 1B.1

DELETE unchecked items | check all | check none

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1	***Accipiter cooperii*** Cooper's hawk	ABNKC12040			G5	S3	
2	***Agelaius tricolor*** tricolored blackbird	ABPBXB0020			G2G3	S2	SC
3	***Ammodramus savannarum*** grasshopper sparrow	ABPBXA0020			G5	S2	SC
4	***Antrozous pallidus*** pallid bat	AMACC10010			G5	S3	SC
5	***Archoplites interruptus*** Sacramento perch	AFCQB07010			G3	S1	SC
6	***Ardea alba*** great egret	ABNGA04040			G5	S4	
7	***Ardea herodias*** great blue heron	ABNGA04010			G5	S4	
8	***Astragalus tener var. ferrisiae*** Ferris' milk-vetch	PDFAB0F8R3			G1T1	S1.1	1B.1
9	***Astragalus tener var. tener*** alkali milk-vetch	PDFAB0F8R1			G1T1	S1.1	1B.2
10	***Athene cunicularia*** burrowing owl	ABNSB10010			G4	S2	SC
11	***Atriplex cordulata*** heartscale	PDCHE040B0			G2?	S2.2?	1B.2
12	***Atriplex depressa*** brittlescale	PDCHE042L0			G2Q	S2.2	1B.2
13	***Atriplex joaquiniana*** San Joaquin spearscale	PDCHE041F3			G2	S2	1B.2
14	***Branchinecta conservatio*** Conservancy fairy shrimp	ICBRA03010	Endangered		G1	S1	
15	***Branchinecta lynchi*** vernal pool fairy shrimp	ICBRA03030	Threatened		G3	S2S3	
16	***Branchinecta mesovallensis*** midvalley fairy shrimp	ICBRA03150			G2	S2	
17	***Buteo regalis*** ferruginous hawk	ABNKC19120			G4	S3S4	
18	***Buteo swainsoni*** Swainson's hawk	ABNKC19070		Threatened	G5	S2	
19	***Charadrius alexandrinus nivosus*** western snowy plover	ABNNB03031	Threatened		G4T3	S2	SC
20	***Charadrius montanus*** mountain plover	ABNNB03100	Proposed Threatened		G2	S2?	SC
21	***Cicindela hirticollis abrupta*** Sacramento Valley tiger beetle	IICOL02106			G5TH	SH	
22	***Coccyzus americanus occidentalis*** western yellow-billed cuckoo	ABNRB02022	Candidate	Endangered	G5T3Q	S1	
23	***Cordylanthus palmatus*** palmate-bracted bird's-beak	PDSCR0J0J0	Endangered	Endangered	G1	S1.1	1B.1

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
24	***Desmocerus californicus dimorphus*** valley elderberry longhorn beetle	IICOL48011	Threatened		G3T2	S2	
25	***Downingia pusilla*** dwarf downingia	PDCAM060C0			G2	S2	2.2
26	***Egretta thula*** snowy egret	ABNGA06030			G5	S4	
27	***Elanus leucurus*** white-tailed kite	ABNKC06010			G5	S3	
28	***Elderberry Savanna***	CTT63440CA			G2	S2.1	
29	***Emys marmorata*** western pond turtle	ARAAD02030			G3G4	S3	SC
30	***Falco columbarius*** merlin	ABNKD06030			G5	S3	
31	***Fritillaria agrestis*** stinkbells	PMLIL0V010			G3	S3.2	4.2
32	***Gratiola heterosepala*** Boggs Lake hedge-hyssop	PDSCR0R060		Endangered	G2	S2	1B.2
33	***Great Valley Cottonwood Riparian Forest***	CTT61410CA			G2	S2.1	
34	***Hibiscus lasiocarpos var. occidentalis*** woolly rose-mallow	PDMAL0H0R3			G4	S2.2	2.2
35	***Juglans hindsii*** Northern California black walnut	PDJUG02040			G1	S1.1	1B.1
36	***Lasionycteris noctivagans*** silver-haired bat	AMACC02010			G5	S3S4	
37	***Lasiurus cinereus*** hoary bat	AMACC05030			G5	S4?	
38	***Legenere limosa*** legenere	PDCAM0C010			G2	S2.2	1B.1
39	***Lepidium latipes var. heckardii*** Heckard's pepper-grass	PDBRA1M0K1			G4T1	S1.2	1B.2
40	***Lepidurus packardi*** vernal pool tadpole shrimp	ICBRA10010	Endangered		G3	S2S3	
41	***Lilaeopsis masonii*** Mason's lilaeopsis	PDAPI19030		Rare	G2	S2	1B.1
42	***Linderiella occidentalis*** California linderiella	ICBRA06010			G3	S2S3	
43	***Myrmosula pacifica*** Antioch multilid wasp	IIHYM15010			GH	SH	
44	***Navarretia leucocephala ssp. bakeri*** Baker's navarretia	PDPLM0C0E1			G4T2	S2.1	1B.1
45	***Neostapfia colusana*** Colusa grass	PMPOA4C010	Threatened	Endangered	G2	S2	1B.1
46	***Northern Claypan Vernal Pool***	CTT44120CA			G1	S1.1	
47	***Northern Hardpan Vernal Pool***	CTT44110CA			G3	S3.1	
48	***Nycticorax nycticorax*** black-crowned night heron	ABNGA11010			G5	S3	
49	***Oncorhynchus tshawytscha*** chinook salmon - Central Valley spring-run ESU	AFCHA0205A	Threatened	Threatened	G5	S1	

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
50	***Oncorhynchus tshawytscha*** chinook salmon - Sacramento River winter-run ESU	AFCHA0205B	Endangered	Endangered	G5	S1	
51	***Phalacrocorax auritus*** double-crested cormorant	ABNFD01020			G5	S3	
52	***Plegadis chihi*** white-faced ibis	ABNGE02020			G5	S1	
53	***Pogonichthys macrolepidotus*** Sacramento splittail	AFCJB34020			G2	S2	SC
54	***Progne subis*** purple martin	ABPAU01010			G5	S3	SC
55	***Riparia riparia*** bank swallow	ABPAU08010		Threatened	G5	S2S3	
56	***Sagittaria sanfordii*** Sanford's arrowhead	PMALI040Q0			G3	S3	1B.2
57	***Taxidea taxus*** American badger	AMAJF04010			G5	S4	SC
58	***Thamnophis gigas*** giant garter snake	ARADB36150	Threatened	Threatened	G2G3	S2S3	
59	***Tuctoria mucronata*** Crampton's tuctoria or Solano grass	PMPOA6N020	Endangered	Endangered	G1	S1.1	1B.1
60	***Xanthocephalus xanthocephalus*** yellow-headed blackbird	ABPBXB3010			G5	S3S4	SC

Selected Elements by Scientific Name

California Department of Fish and Game

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFG SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S3	WL
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	None	G2G3	S2	SSC
Ammodramus savannarum grasshopper sparrow	ABPBXA0020	None	None	G5	S2	SSC
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Archoplites interruptus Sacramento perch	AFCQB07010	None	None	G3	S1	SSC
Ardea alba great egret	ABNGA04040	None	None	G5	S4	
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Astragalus tener var. ferrisiae Ferris' milk-vetch	PDFAB0F8R3	None	None	G1T1	S1	1B.1
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T2	S2	1B.2
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S2	SSC
Atriplex cordulata var. cordulata heartscale	PDCHE040B0	None	None	G3T2	S2.2?	1B.2
Atriplex depressa brittlescale	PDCHE042L0	None	None	G2Q	S2.2	1B.2
Atriplex joaquinana San Joaquin spearscale	PDCHE041F3	None	None	G2	S2	1B.2
Branchinecta conservatio Conservancy fairy shrimp	ICBRA03010	Endangered	None	G1	S1	
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S2S3	
Branchinecta mesovallensis midvalley fairy shrimp	ICBRA03150	None	None	G2	S2	
Buteo regalis ferruginous hawk	ABNKC19120	None	None	G4	S3S4	WL
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S2	
Carex comosa bristly sedge	PMCYP032Y0	None	None	G5	S2	2.1
Charadrius alexandrinus nivosus western snowy plover	ABNNB03031	Threatened	None	G4T3	S2	SSC
Charadrius montanus mountain plover	ABNNB03100	Proposed Threatened	None	G2	S2?	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFG SSC or FP
Chloropyron palmatum palmate-bracted bird's-beak	PDSCR0J0J0	Endangered	Endangered	G1	S1	1B.1
Cicindela hirticollis abrupta Sacramento Valley tiger beetle	IICOL02106	None	None	G5TH	SH	
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Candidate	Endangered	G5T3Q	S1	
Cuscuta obtusiflora var. glandulosa Peruvian dodder	PDCUS01111	None	None	G5T4T5	SH	2.2
Desmocerus californicus dimorphus valley elderberry longhorn beetle	IICOL48011	Threatened	None	G3T2	S2	
Downingia pusilla dwarf downingia	PDCAM060C0	None	None	G2	S2	2.2
Egretta thula snowy egret	ABNGA06030	None	None	G5	S4	
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3	FP
Elderberry Savanna Elderberry Savanna	CTT63440CA	None	None	G2	S2.1	
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Falco columbarius merlin	ABNKD06030	None	None	G5	S3	WL
Fritillaria agrestis stinkbells	PMLIL0V010	None	None	G3	S3.2	4.2
Gratiola heterosepala Boggs Lake hedge-hyssop	PDSCR0R060	None	Endangered	G2	S2	1B.2
Great Valley Cottonwood Riparian Forest Great Valley Cottonwood Riparian Forest	CTT61410CA	None	None	G2	S2.1	
Hibiscus lasiocarpos var. occidentalis woolly rose-mallow	PDMAL0H0R3	None	None	G4	S2.2	1B.2
Juglans hindsii Northern California black walnut	PDJUG02040	None	None	G1	S1.1	1B.1
Lasionycteris noctivagans silver-haired bat	AMACC02010	None	None	G5	S3S4	
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4?	
Legenere limosa legenere	PDCAM0C010	None	None	G2	S2.2	1B.1
Lepidium latipes var. heckardii Heckard's pepper-grass	PDBRA1M0K1	None	None	G4T1	S1.2	1B.2
Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered	None	G3	S2S3	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFG SSC or FP
Lilaeopsis masonii Mason's lilaeopsis	PDAPI19030	None	Rare	G2	S2	1B.1
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G3	S2S3	
Myrmosula pacifica Antioch multilid wasp	IIHYM15010	None	None	GH	SH	
Navarretia leucocephala ssp. bakeri Baker's navarretia	PDPLM0C0E1	None	None	G4T2	S2	1B.1
Neostapfia colusana Colusa grass	PMPOA4C010	Threatened	Endangered	G2	S2	1B.1
Northern Claypan Vernal Pool Northern Claypan Vernal Pool	CTT44120CA	None	None	G1	S1.1	
Northern Hardpan Vernal Pool Northern Hardpan Vernal Pool	CTT44110CA	None	None	G3	S3.1	
Nycticorax nycticorax black-crowned night heron	ABNGA11010	None	None	G5	S3	
Oncorhynchus tshawytscha chinook salmon - Central Valley spring-run ESU	AFCHA0205A	Threatened	Threatened	G5	S1	
Oncorhynchus tshawytscha chinook salmon - Sacramento River winter-run ESU	AFCHA0205B	Endangered	Endangered	G5	S1	
Phalacrocorax auritus double-crested cormorant	ABNFD01020	None	None	G5	S3	WL
Plagiobothrys hystriculus bearded popcornflower	PDBOR0V0H0	None	None	G1G2	S1S2	1B.1
Plegadis chihi white-faced ibis	ABNGE02020	None	None	G5	S1	WL
Pogonichthys macrolepidotus Sacramento splittail	AFCJB34020	None	None	G2	S2	SSC
Progne subis purple martin	ABPAU01010	None	None	G5	S3	SSC
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2S3	
Sagittaria sanfordii Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
Symphyotrichum lentum Suisun Marsh aster	PDASTE8470	None	None	G2	S2	1B.2
Taxidea taxus American badger	AMAJF04010	None	None	G5	S4	SSC
Thamnophis gigas giant garter snake	ARADB36150	Threatened	Threatened	G2G3	S2S3	
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFG SSC or FP
Tuctoria mucronata	PMPOA6N020	Endangered	Endangered	G1	S1	1B.1
Crampton's tuctoria or Solano grass						
Vireo bellii pusillus	ABPBW01114	Endangered	Endangered	G5T2	S2	
least Bell's vireo						
Xanthocephalus xanthocephalus	ABPBXB3010	None	None	G5	S3S4	SSC
yellow-headed blackbird						

Record Count: 66

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S3	WL
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	None	G2G3	S2	SSC
Ammodramus savannarum grasshopper sparrow	ABPBXA0020	None	None	G5	S2	SSC
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Archoplites interruptus Sacramento perch	AFCQB07010	None	None	G3	S1	SSC
Ardea alba great egret	ABNGA04040	None	None	G5	S4	
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Astragalus tener var. ferrisiae Ferris' milk-vetch	PDFAB0F8R3	None	None	G1T1	S1	1B.1
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T2	S2	1B.2
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S2	SSC
Atriplex cordulata var. cordulata heartscale	PDCHE040B0	None	None	G3T2	S2.2?	1B.2
Atriplex depressa brittlescale	PDCHE042L0	None	None	G2Q	S2.2	1B.2
Atriplex joaquinana San Joaquin spearscale	PDCHE041F3	None	None	G2	S2	1B.2
Branchinecta conservatio Conservancy fairy shrimp	ICBRA03010	Endangered	None	G1	S1	
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S2S3	
Branchinecta mesovallensis midvalley fairy shrimp	ICBRA03150	None	None	G2	S2	
Buteo regalis ferruginous hawk	ABNKC19120	None	None	G4	S3S4	WL
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S2	
Carex comosa bristly sedge	PMCYP032Y0	None	None	G5	S2	2.1
Charadrius alexandrinus nivosus western snowy plover	ABNNB03031	Threatened	None	G4T3	S2	SSC
Charadrius montanus mountain plover	ABNNB03100	Proposed Threatened	None	G2	S2?	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Chloropyron palmatum palmate-bracted bird's-beak	PDSCR0J0J0	Endangered	Endangered	G1	S1	1B.1
Cicindela hirticollis abrupta Sacramento Valley tiger beetle	IICOL02106	None	None	G5TH	SH	
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Candidate	Endangered	G5T3Q	S1	
Cuscuta obtusiflora var. glandulosa Peruvian dodder	PDCUS01111	None	None	G5T4T5	SH	2.2
Desmocerus californicus dimorphus valley elderberry longhorn beetle	IICOL48011	Threatened	None	G3T2	S2	
Downingia pusilla dwarf downingia	PDCAM060C0	None	None	G2	S2	2.2
Egretta thula snowy egret	ABNGA06030	None	None	G5	S4	
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3	FP
Elderberry Savanna Elderberry Savanna	CTT63440CA	None	None	G2	S2.1	
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Falco columbarius merlin	ABNKD06030	None	None	G5	S3	WL
Fritillaria agrestis stinkbells	PMLIL0V010	None	None	G3	S3.2	4.2
Gratiola heterosepala Boggs Lake hedge-hyssop	PDSCR0R060	None	Endangered	G2	S2	1B.2
Great Valley Cottonwood Riparian Forest Great Valley Cottonwood Riparian Forest	CTT61410CA	None	None	G2	S2.1	
Hibiscus lasiocarpos var. occidentalis woolly rose-mallow	PDMAL0H0R3	None	None	G4	S2.2	1B.2
Juglans hindsii Northern California black walnut	PDJUG02040	None	None	G1	S1	1B.1
Lasionycteris noctivagans silver-haired bat	AMACC02010	None	None	G5	S3S4	
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4?	
Legenere limosa legenere	PDCAM0C010	None	None	G2	S2.2	1B.1
Lepidium latipes var. heckardii Heckard's pepper-grass	PDBRA1M0K1	None	None	G4T2	S2	1B.2
Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered	None	G3	S2S3	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Lilaeopsis masonii Mason's lilaeopsis	PDAPI19030	None	Rare	G2	S2	1B.1
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G3	S2S3	
Myrmosula pacifica Antioch multilid wasp	IIHYM15010	None	None	GH	SH	
Navarretia leucocephala ssp. bakeri Baker's navarretia	PDPLM0C0E1	None	None	G4T2	S2	1B.1
Neostapfia colusana Colusa grass	PMPOA4C010	Threatened	Endangered	G2	S2	1B.1
Northern Claypan Vernal Pool Northern Claypan Vernal Pool	CTT44120CA	None	None	G1	S1.1	
Northern Hardpan Vernal Pool Northern Hardpan Vernal Pool	CTT44110CA	None	None	G3	S3.1	
Nycticorax nycticorax black-crowned night heron	ABNGA11010	None	None	G5	S3	
Oncorhynchus tshawytscha chinook salmon - Central Valley spring-run ESU	AFCHA0205A	Threatened	Threatened	G5	S1	
Oncorhynchus tshawytscha chinook salmon - Sacramento River winter-run ESU	AFCHA0205B	Endangered	Endangered	G5	S1	
Phalacrocorax auritus double-crested cormorant	ABNFD01020	None	None	G5	S3	WL
Plagiobothrys hystriculus bearded popcornflower	PDBOR0V0H0	None	None	G1G2	S1S2	1B.1
Plegadis chihi white-faced ibis	ABNGE02020	None	None	G5	S1	WL
Pogonichthys macrolepidotus Sacramento splittail	AFCJB34020	None	None	G2	S2	SSC
Progne subis purple martin	ABPAU01010	None	None	G5	S3	SSC
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2S3	
Sagittaria sanfordii Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
Symphyotrichum lentum Suisun Marsh aster	PDASTE8470	None	None	G2	S2	1B.2
Taxidea taxus American badger	AMAJF04010	None	None	G5	S4	SSC
Thamnophis gigas giant garter snake	ARADB36150	Threatened	Threatened	G2G3	S2S3	
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Tuctoria mucronata	PMPOA6N020	Endangered	Endangered	G1	S1	1B.1
Crampton's tuctoria or Solano grass						
Vireo bellii pusillus	ABPBW01114	Endangered	Endangered	G5T2	S2	
least Bell's vireo						
Xanthocephalus xanthocephalus	ABPBXB3010	None	None	G5	S3S4	SSC
yellow-headed blackbird						

Record Count: 66

Appendix G

Utility Assessment for Basin-Wide Problem Identification Report

PREVIOUS EXISTING UTILITIES AND ENCROACHMENT DOCUMENTS

Southport EIP TO3 ***October 25, 2011***

Reviewed by: Richard Dirks

Prepared by: Sean McNeil

1.0 Introduction

The following utility and encroachments information is based on the *Civil Design Considerations* appendix in the *Southport Sacramento River EIP Interim Preliminary Design* dated September 2011. After this report was completed there has been more research on the docking facility encroachments and this new information is provided in Section 2 below. This Technical Memorandum will be revised as new docking facilities/utility and encroachment information is gathered. Modifications to the tables will be tracked in the footer as new information is discovered.

2.0 Existing Utilities and Encroachments

An inventory of existing utilities and permitted encroachments that may require modification or relocation was compiled in the *Interim Preliminary Planning Report* (dated January 28, 2011) from a variety of data sources. Data sources included field inspection reports, research conducted by Kjeldsen, Sinnock, and Neudeck, Inc., as part of the levee evaluation survey work which was adopted into the *Draft Problem Identification Report* (dated April 2008), and review of Central Valley Flood Protection Board encroachment permits.

The inventory of permitted or observed utilities and permitted encroachments has been reduced to include only those that may impact the project. If a utility is in close proximity to the project footprint, it was considered to potentially impact the project. The potentially impacted utilities and permitted encroachments are noted **in Table 1 – Existing Utilities and Encroachments** and shown in **Exhibit 1 – Existing Utilities and Encroachments Map**. The location designators are Levee Mile (LM) indicators and Project Station (PS). The utilities are shown on Exhibit 1 as overhead, underground or miscellaneous encroachments. The utility modifications associated with each Combined Measure Alternative (CMA) are noted in the table. A modification means the utility or encroachment will either be abandoned or relocated. The following paragraphs provide additional information on the more significant utilities and encroachments.

An irrigation pump station (**LM 3.35, PS 236+81**) near Linden Road will need to be relocated for all alternatives. It is located on the Southwest corner of Linden Road and South River Road (SRR) on the landside of the levee. It has an 80-hp pump and a 30-inch intake pipe under the existing levee. The intake is at approximate elevation 16.0 in the Sacramento River. It discharges into a distribution box located nearby which controls flow to the North, West and South through gated pipelines.

A cellular communications tower (**LM 3.35, PS 236+81**) located immediately adjacent to the pump station will also have to be relocated for all alternatives.

A 120" sanitary sewer trunk main (**See Exhibit 1, PS 0+00 through 60+00**) is located approximately 950' west of SRR from station 0+00 to 50+00. This facility will be impacted by the setback levee alternative (CMA 2) and will require manhole adjustments to grade where the proposed new road crosses the existing sewer trunk main alignment. The other alternatives will not be impacted by this sewer trunk main.

An 8" Chevron Fuel line (**Table 1, PS - 0+00 through 60+00**) is located approximately 25' west of SRR from station 0+00 to 50+00. This facility will be impacted by all alternatives and will require relocation outside of the construction footprint.

The main overhead line along the existing SRR and the impacted portions of Linden and Davis Roads are assumed to be relocated for all alternatives. The associated services that will remain may need to be relocated as well. Note that this is not shown on the table or exhibit.

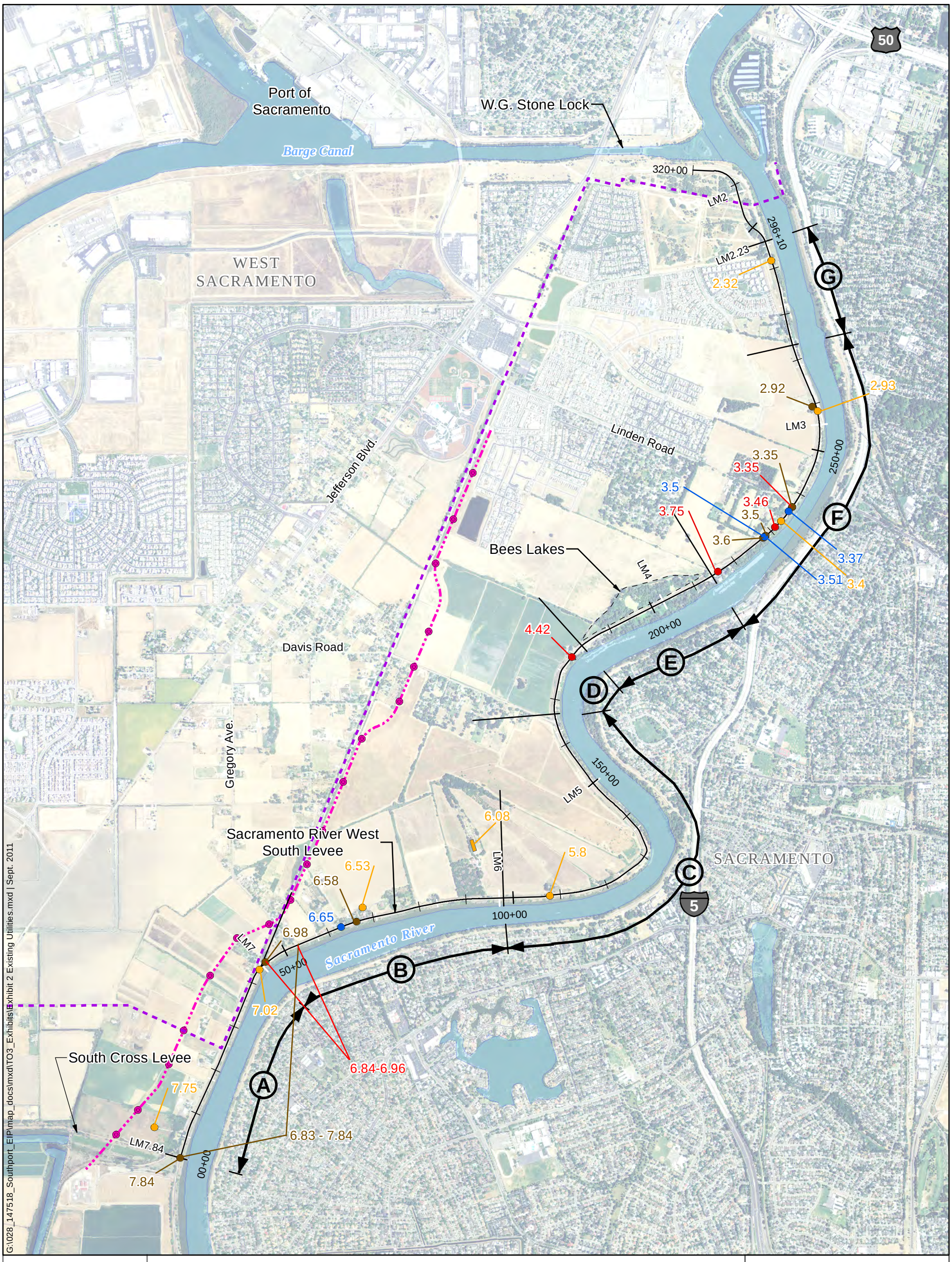
The abandoned septic tanks and water wells associated with the structures to be purchased are also not shown in the table or exhibit.

Table 1-Existing Utilities and Encroachments

Levee Mile	Project Station	Permit No.	Permittee	Contact Information	Encroachment	Utility Status During and Post Construction		
						CMA 1	CMA 2	CMA 3
2.23 – 7.84, 3.46	180+00, 231+30	13969, 8535	PG&E	5555 Florin - Perkins Road P.O. Box 7444 Sacramento, CA 1-877-743-7782	12 kV pole lines located along levee.	Provide new electrical service to relocated power line.	Provide new electrical service to relocated power line.	Provide new electrical service to relocated power line.
2.32	293+00	N/A	–	–	12" Metal Pipe (concrete filled)	–	Will be removed due to construction activities.	–
2.93	258+50	N/A	–	–	12" Metal Pipe (concrete filled)	–	Will be removed due to construction activities.	–
3.35	236+81	N/A	–	Reclamation District 900	RD 900 Irrigation Pump Station and supporting infrastructure.	Facility requires relocation.	Facility requires relocation.	Facility requires relocation.
3.35	236+81	–	–	–	Cellular Facility (Tower and Buildings).	Must relocate and remain active.	Must relocate and remain active.	Must relocate and remain active.
3.37	236+80	No Permit	–	–	Private Property - Boat	–	Facility will be removed due to construction activities.	–
3.4	239+00	N/A	–	–	Proposed relocation of pumphouse and Cellular Facility	-–	Will require temporary power and electrical drop from utility corridor.	-–
3.5	228+50	13014	Clyde W. Perkins	Reclamation District 900	Construct a 4' X 100' boat dock anchored to driven piling in the Sacramento River near the right bank. Also to construct a walkway and ramp on the waterside of the levee and place electric and water lines through levee at walkway.	No action required.	Electric and Water lines will be removed due to construction activities.	Electric and Water lines will be removed due to construction activities.
3.5	228+50	13014	Clyde W. Perkins	Reclamation District 900	Construct a 4' X 100' boat dock anchored to driven piling in the Sacramento River near the right bank. Also to construct a walkway and ramp on the waterside of the levee and place electric and water lines through levee at walkway.	No action required.	Facility will be removed due to construction activities.	Facility will be removed due to construction activities.
3.51	228+60	No Permit	(Abandon)	–	Abandoned boat dock.	–	Facility will be removed due to construction activities.	–

Levee Mile	Project Station	Permit No.	Permittee	Contact Information	Encroachment	Utility Status During and Post Construction		
						CMA 1	CMA 2	CMA 3
3.6	227+78	15332	Sacramento Yacht Club	Reclamation District 900 c/o The Reclamation Board 1416 - 9th Street, Sacramento, CA	To landscape and install an irrigation system on the waterward slope of the right bank levee of the Sacramento River.	No action required.	Facility will be removed due to construction activities.	Facility will be removed due to construction activities.
3.75	215+90	3409A	George M. Vashloz	808 Garnet West Sacramento, CA	Installation of an overhead crossing for power lines to Driftwood Boat Harbor Club House on right bank of the Sacramento River.	Provide new electrical service to relocated power line.	Provide new electrical service to relocated power line.	Provide new electrical service to relocated power line.
5.8	108+00	N/A	–	–	8" Metal Pipe and shut off valve	–	Will be removed due to construction activities.	–
6.08	95	N/A	–	–	Communication Towers and supporting bldgs.	Will require temporary power and supporting bldgs to be relocated.	Will require temporary power and supporting bldgs to be relocated.	Will require temporary power and supporting bldgs to be relocated.
6.53	65+00	N/A	–	–	Private Property	-–	Will require temporary power and electrical drop from utility corridor.	-–
6.65	63+00	15509	Bert Culbreth and Terry C. Annesley	Reclamation District 900	Stairs on levee slope, Gangway, Floating Dock and 3 piles.	No action required.	Facility will be removed due to construction activities.	Facility will be removed due to construction activities.
6.84 - 6.96, 2.92, 6.83 - 7.84	52+75 - 46+35, 259+60, 53+30 - 00+00	4276	AT&T, Pacific Bell	AT&T California	Various ATT poles and underground infrastructure along levee.	Powerline and underground infrastructure to be relocated.	Powerline and underground infrastructure to be relocated.	Powerline and underground infrastructure to be relocated.
6.98	46+20	–	–	–	Pipe in ground.	No action required.	Facility will be removed due to construction activities.	Facility will be removed due to construction activities.
7.02	44+20	N/A	–	–	Abandon Electric Meter.	Facility will be removed due to construction activities.	Facility will be removed due to construction activities.	Facility will be removed due to construction activities.
7.75	5+00	N/A	–	–	Radio Station	-–	Will require temporary power and electrical drop from utility corridor.	–
7.84	00+00	17734	Sacramento Regional County Sanitation District	10060 Goethe Road, Sacramento, CA 95827 916-875-7000	To temporarily install (approximately 2 years) two 10-inch diameter restrained joint plastic pipes encased in 12 in diameter steel pipes through the crown of the right bank levee for dewatering purposes.	–	–	–
See Exhibit 1	0+00 - 60+00	N/A	–	Sacramento County Sanitation District	120" Sacramento County Sewer Trunk Main.	–	Facility will be protected in place.	–
See Exhibit 1	0+00 - 60+00	N/A	–	Chevron	8 " Fuel Pipeline.	Requires relocation.	Requires relocation.	Requires relocation.
2.23 – 7.84, 3.46	180+00, 231+30	13969, 8535	PG&E	5555 Florin - Perkins Road P.O. Box 7444 Sacramento, CA 1-877-743-7782	12 kV pole lines located along levee.	Provide new electrical service to relocated power line.	Provide new electrical service to relocated power line.	Provide new electrical service to relocated power line.

Note: None



G:\028_147518_Southport_EIP\map_docs\mxd\TO3_Exhibits\Exhibit 2 Existing Utilities.mxd | Sept. 2011

WSAFCA
West Sacramento Area Flood Control Agency

Levee Improvement Program Southport Early Implementation Project

Project Manager
M. VECCHIO, HDR

Designed
D. MUI, HDR

Checked
S. MCNEIL, HDR

Drawn
A. ARNOLD, HDR

ENCROACHMENT POINT IDENTIFIED BY LEVEE MILE

- OVERHEAD UTILITIES
- DOCKING FACILITIES
- UNDERGROUND UTILITIES
- MISCELLANEOUS ENCROACHMENTS

- 8" CHEVRON FUEL PIPELINE
- SEWER MANHOLE
- 120" SANITARY SEWER MAIN

A — COST EVALUATION SEGMENT

LM2 — PROJECT STATIONING / LEVEE MILES (DWR, 1990)

Existing Utilities and Encroachments Map

Exhibit 1

Project Num: 166505

October 2011

N W E S

0 1,000 2,000 3,000 4,000
Feet

1 inch = 2,000 feet

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Appendix H

Public Health and Hazards: EDR Data Map Environmental Atlas

SCS ENGINEERS

Area-Wide Assessment Summary Report

Sacramento River Southport Early Implementation Project West Sacramento, California 92101

Presented to:

West Sacramento Area Flood Control Agency
Mr. Paul Dirksen
1110 West Capitol Avenue
West Sacramento, California 95691
(916) 617-4555

Presented by:

SCS ENGINEERS
852 Northport Drive, Suite 5
West Sacramento, CA 95691
(916) 361-1297

August 7, 2012

Project Number: 01212113.00

Offices Nationwide
www.scsengineers.com

August 7, 2012
Project Number: 0101205528.01

Mr. Paul Dirksen
West Sacramento Area Flood Control Agency
1110 West Capitol Avenue
West Sacrament, California 95691

Subject: **Area-Wide Assessment Summary Report**

Site: **Sacrament River Southport Early Implementation Project**
West Sacramento, California

Dear Mr. Dirksen:

SCS Engineers (SCS) is pleased to present this summary report (Report) of the Area-Wide Assessment (Assessment) conducted for the levee improvement project known as Sacramento River Southport Early Implementation Project (SRSEIP) at the above-described Site. This Report summarizes the results of the work that was conducted in order to evaluate the Site's current environmental conditions. The work described in this Report was performed by SCS in general accordance with Exhibit A to the Contract for Services (Contract) between the West Sacramento Area Flood Control Agency (Client) and SCS. Exhibit A and the Contract were fully executed on April 12, 2012

If we may assist you in any way, now or in the future, please call our office at (916) 361-1297.

Sincerely,

Nicki Field
Senior Project Professional
SCS ENGINEERS

Steve Clements, PG 6740
Senior Technical Manager
SCS ENGINEERS

Wayne Pearce, PG 4191
Senior Technical Manager
SCS ENGINEERS

Daniel E. Johnson
Vice President
SCS ENGINEERS

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A	FirstSearch Regulatory Database Search Report
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F	Aerial Photographs
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1 BACKGROUND

The Site is an approximately 6-mile corridor along the Sacramento River consisting of portions of 121 parcels, South River Road, and the existing levees. The proposed Sacramento River Southport Early Implementation Project (SRSEIP) is part of a program established in 2005 by the City of West Sacramento (City) to improve the City's flood protection system and meet new Federal standards for levees. The West Sacramento Area Flood Control Agency (Client) is undertaking the levee improvements for the SRSEIP in order to achieve a minimum 200-year flood protection.

The SRSEIP will require the acquisition and development (levee improvements) of the Site, and SCS Engineers (SCS) has been contracted by the Client to provide as-needed due diligence and cleanup planning services as part of this project.

In addition to the Area-Wide Assessment (Assessment), due diligence services are anticipated to include conducting Phase I Environmental Site Assessments (Phase I ESAs) on any properties or portions of properties to be acquired by the Client for the SRSEIP, and Phase II Environmental Site Investigations (Phase IIs) on any properties or portions of properties to be acquired that are identified in the ESAs as having potential recognized environmental conditions (RECs).[1,2] Based on the findings of the Phase IIs, cleanup planning services will be provided for those properties within the SRSEIP where constituents of concern (CoCs) are found at levels which may impact levee improvement activities.

2 OBJECTIVES

The objectives of the scope of services were to:

- Assess the likelihood[3] that RECs are present at the Site as a result of the current or historical Site land use or from a known and reported off-Site source.
- Provide preliminary information in support of future Phase I ESAs.
- Collect sufficient information to evaluate the need for Phase IIs.
- Incorporate the findings of the Assessment into a Geographic Information System (GIS).

---

1 *RECs*, as defined by the American Society for Testing and Materials (ASTM), include the presence or likely presence of hazardous substances or petroleum products on a property that indicate an existing release, a past release, or a material threat of release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water on the property. However, the term is not intended to include *de minimis* conditions. A condition considered *de minimis* is not a REC.

2 *De minimis conditions*, as defined by ASTM, are environmental conditions that do not generally present a material risk of harm to the public health or the environment and that generally would not be subject to an enforcement action if brought to the attention of appropriate governmental agencies.

3 Statements of "likelihood" are made in this Report, based on the professional judgment of SCS. A description of likelihood statements, as made in this Report, is included on page 7.

3 SCOPE OF SERVICES

The scope of services included the following:

- Regulatory records review
- Historical research and land use review
- Limited Site reconnaissance
- GIS Integration

REGULATORY RECORDS REVIEW

Environmental FirstSearch™ Site Assessment Report

A Site Assessment Report[4] was prepared by the FirstSearch Technologies Corporation (FirstSearch) for the Site. Local, state, and federal regulatory databases were reviewed for the Site and for those facilities within up to 1 mile of the Site. The FirstSearch report was reported to have been prepared in general accordance with the ASTM standard for the regulatory database review for Phase I ESAs. The locations of the referenced facilities relative to the Site are shown on FirstSearch's "Map of Sites within One Mile," which is included in its report. A description of the various databases, as well as the date each database was most recently updated, is included in the FirstSearch report. The FirstSearch report is provided in Appendix A.

Based on a review of the FirstSearch Report, the following table summarizes the facilities within the selected search perimeters, and whether the Site or a facility that was interpreted to be adjacent to the Site was listed on each database.

Federal or State Government Database	Search Radius	Number of Reported Facilities	On Site	Adjacent to the Site
National Priorities List (NPL)	1.00 mile	0	No	No
NPL Delisted	0.50 mile	0	No	No
Comprehensive Environmental Response Compensation and Liability System (CERCLIS)	0.50 mile	0	No	No
No Further Remedial Action Planned (NFRAP)	0.50 mile	0	No	No
Resource Conservation and Recovery Act-Corrective Action (RCRA COR ACT)	1.00 mile	0	No	No
RCRA Treatment, Storage, and Disposal Facilities (RCRA TSD)	0.50 mile	0	No	No
RCRA Generators (RCRA GEN)	0.25 mile	0	No	No

4 *Environmental FirstSearch™ Report, South River Road, West Sacramento, CA 95691*, by FirstSearch Technologies Corporation, dated February 28, 2012.

Federal or State Government Database	Search Radius	Number of Reported Facilities	On Site	Adjacent to the Site
RCRA no longer listed facilities (RCRA NLR)	0.125 mile	0	No	No
Federal Brownfield	0.25	0	No	No
Federal Engineering and Institutional Controls (IC/EC)	0.25 mile	0	No	No
Emergency Response Notification System (ERNS)	0.125 mile	2	Yes	No
Tribal Lands	1.00 mile	0	No	No
State/Tribal Sites	1.00 mile	7	No	Yes
Spills-1990	0.125 mile	0	No	No
State/Tribal solid waste list (SWL)	0.50 mile	0	No	No
State/Tribal leaking underground storage tanks (LUST)	0.50 mile	2	No	No
State/Tribal underground/aboveground storage tanks (USTs/ASTs)	0.25 mile	0	No	No
State/Tribal deed-restriction site listing (EC/IC)	0.25 mile	0	No	No
State/Tribal voluntary cleanup program (VCP)	0.50 mile	0	No	No
State/Tribal Brownfields	0.50 mile	0	No	No
State Permits	0.25 mile	0	No	No
State Other	0.25 mile	2	No	Yes
HW Manifest	0.125 mile	0	No	No

Please note, while 13 listings on four different databases were included in the FirstSearch report, most of these Sites were reported or interpreted to be across the Sacramento River to the east of the Site or the deep water channel north of the Site. Only five of these listings were interpreted to possibly be at or adjacent to the Site, and therefore subject to further review. All of these facilities were non-geocoded due to incorrect or incomplete addresses. SCS personnel made an attempt to locate these non-geocoded facilities and placed them as accurately as possible on Figure 1. The five listings on the FirstSearch report interpreted to be within or adjacent to the Site are summarized in the following table

Facility	Address	Database (Source)	Interpreted Location
Stonegate Elementary School	Stonegate Drive and La Jolla Street	State (DTSC)	2500 La Jolla Street
Liberty Elementary School Site	North of Davis and of Antioch Road	Other (DTSC)	Same facility, adjacent to Site at portion of APN 046-100-09
Liberty Elementary School Site	North of Davis Road and East of Antioch Ave	State (DTSC)	
Unknown	Near Levy South River Road/.25 Miles South of Davis	ERNs (EPA)	Possibly same facility, within Site, potentially at APN 046-270-35
Yolo County Environmental Health Department	Sacramento River Near Davis and South River Road	ERNs (EPA)	

The files for the Liberty Elementary School Site were requested from the Department of Toxic Substances Control (DTSC), reviewed, and are discussed below. The files for the Stonegate Elementary School were not reviewed based on distance from the Site (while this facility is technically adjacent to one of the Site parcels, it is actually more than 2,000 feet from the SRSEIP project area). SCS attempted to request and review records for the ERNs releases; however, due to the incomplete addresses, the Yolo County Department of Environmental Health (DEH) could not locate files for these facilities. SCS has submitted a request to review files for all available Site addresses; however, this request is still being processed at the time of this Report. Information from the DEH files will be reviewed as it becomes available and incorporated into the Phase I ESA reports that will be prepared in subsequent phases of the SRSEIP. Please note, the interpreted locations of the non-geocoded facilities may not be correct, and should be verified during file reviews.

DTSC File Review

The DTSC files for the Liberty School Site were reviewed by SCS personnel on May 17, 2012. The facility was found to be located adjacent to the Site on a portion of APN 046-100-09. This file included several documents related to the evaluation of this parcel as a future school site. A Preliminary Environmental Assessment (PEA) report is referenced in the file, but was not received or reviewed by SCS. Based on a PEA report approval letter from the DTSC dated January 28, 2011, an unknown number of soil samples were collected from the Site and analyzed for arsenic and organochlorine pesticides. The soil samples were reported to have arsenic concentrations ranging from 8.1 to 11 milligrams per kilogram (mg/kg), and no detectable concentrations of organochlorine pesticides. The letter went on to state that "Based on review of the PEA report and consideration of public comments, neither a release of hazardous material nor the presence of a naturally occurring hazardous materials which would pose a threat to public health or the environment under unrestricted land use was indicated at the Site. Therefore, DTSC concurs with the conclusion of the PEA report that further environmental investigation of the site is not required and hereby approves the PEA report."

Based on the information reviewed in the DTSC files for this facility, there is a low likelihood that a release from this facility has resulted in a REC at the Site. Copies of the files for this facility have been included in Appendix B.

City of West Sacramento Records

On May 23, 2012, a records request was made to the City for records for all known Site addresses and parcels. Records from the City Building, Engineering, and Fire Departments were available for numerous Site parcels, and were provided to the SCS. SCS has reviewed this information and incorporated it into the land use database and GIS for the Site. Several records were found that indicated or were interpreted to indicate that land uses or features of potential concern were present with the potential to result in RECs at the Site. Copies of these records have been included in the Appendices C, D, and E.

HISTORICAL RECORDS REVIEW

In accordance with the American Society for Testing and Materials (ASTM) Standard and All Appropriate Inquiry (AAI) rule, numerous reasonably ascertainable standard historical information sources were reviewed, and an attempt was made to interpret the historical Site and Site vicinity land use back to the apparent first use of the Site. The following table summarizes the historical resources reviewed as part of this Assessment:

Resource	Location/Source	Years Available
Aerial Photographs	Environmental FirstSearch	1937, 1952, 1961, 1976, 1981, 1987
Aerial Photographs	NETR Online	1957, 1964, 2005
City Directories	Environmental FirstSearch	1982, 1987, 1992, 1997, 2002, 2006, 2012
Sanborn Fire Insurance Maps	Environmental FirstSearch	None available
Topographic Maps	Environmental FirstSearch	1913, 1949, 1967, 1975, 1980, 1992
Building Department Records	City of West Sacramento	2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007
Engineering Department Records	City of West Sacramento	2000, 2002, 2003, 2004, 2005, 2006, 2007, 2010, 2011, 2012
Fire Department Records	City of West Sacramento	1992, 1993, 1995, 1996, 1999, 2001, 2002, 2005, 2010, 2011

The information from review of these records has been incorporated into the land use database and GIS for the Site. Based on the historical research, the Site has historically been used for agriculture and residential land uses. Many parcels were identified through the historical research as having potential RECs. Figures 2-1 through 2-11 depict historical land uses for the Site parcels. Copies of the aerial photographs, city directories, and topographic maps have been included in the Appendices F, G, and H, respectively.

LIMITED SITE RECONNAISANCE

On June 19, 2012, Chad Peddy of SCS conducted a limited Site reconnaissance from public right-of-ways, mainly from South River Road, to observe and document current Site conditions. These observations were added to the land use database developed for the Site and incorporated into the GIS, along with numerous photographs taken during the Site reconnaissance. Figure 3 shows the locations where photographs were taken. To view photographs, please access the GIS files via the City's GIS.

GIS INTEGRATION AND DEVELOPMENT

The information gathered during the Assessment was entered into a historical land use and environmental database and integrated into a GIS. The base data for the GIS were obtained from publically available sources, such as the City of West Sacramento, Yolo County, and the State of California Cal Atlas Geospatial Clearinghouse. The limit of work boundary was provided to SCS

by HDR, Inc. Additional features and layers were created to depict the results of the Assessment. GIS files will be provided directly to the City for integration into the City's GIS.

4 FINDINGS

Based on the data obtained and reviewed as part of this Assessment, approximately 80 parcels were identified as having potential RECs and recommended for Phase II work. The vast majority of the potential RECs were associated with current or historical agriculture and related to the potential for metallic and/or organochlorine pesticides to be present. In addition, 14 parcels were identified as having or historically having had fuel tanks (aboveground or underground) and dispensers.

A truncated database table has been included in Appendix I. Land use information and potential RECs and contaminants by parcel have been summarized in the table. Figures 4-1 through 4-11 depict parcels recommended for Phase II work.

5 RECOMMENDATIONS

Based on the data obtained during this Assessment and our findings, SCS recommends the following:

- The results of the Assessment should be incorporated into a Phase II workplan(s).
- Site reconnaissance should be conducted of parcels recommended for Phase IIs to place sampling locations and verify actual Site conditions.
- The locations of any current or historical tank systems should be verified via Site reconnaissance, interviews, and geophysical surveys, as necessary.
- Shallow soil sampling should be conducted to assess the potential presence and concentration of metals and pesticides.
- Soil sampling should be conducted to assess the potential presence and concentration of petroleum hydrocarbons and associated constituents from releases of fuels from tank systems
- Lead and asbestos surveys should be conducted for any structures proposed for demolition within the Site.

6 REPORT USAGE AND FUTURE SITE CONDITIONS

This Report is intended for the sole usage of the Client and other parties designated by the Client. The methodology used during this Assessment was in general conformance with the requirements of the Client and the specifications and limitations presented in the Agreement between the Client and SCS. This Report contains information from a variety of public and other sources, and SCS makes no representation or warranty about the accuracy, reliability, suitability,

or completeness of the information. Any use of this Report, whether by the Client or by a third party, shall be subject to the provisions of the Agreement between the Client and SCS.

Assessments are qualitative, not comprehensive, in nature and may not identify all environmental problems or eliminate all risk. For every property, but especially for properties in older downtown or urban areas, it is possible for there to be unknown, unreported recognized environmental conditions, underground storage tanks, or other features of concern that might become apparent through demolition, construction, or excavation activities, etc. In addition, the scope of services for this project was limited to those items specifically named in the scope of services for this Report. Environmental issues not specifically addressed in the scope of services for this project are not included in this Report.

Land use, condition of the properties within the Site, and other factors may change over time. The information and conclusions of this Report are judged to be relevant at the time the work described in this Report was conducted. This Report should not be relied upon to represent future Site conditions unless a qualified consultant familiar with the practice of Phase I ESAs in the County of Yolo is consulted to assess the necessity of updating this Report.

The property owners at the Site are solely responsible for notifying all governmental agencies and the public of the existence, release, or disposal of any hazardous materials/wastes or petroleum products at the Site, whether before, during, or after the performance of SCS services. SCS assumes no responsibility or liability for any claim, loss of property value, damage, or injury that results from hazardous materials/wastes or petroleum products being present or encountered within the Site.

Although this Assessment has attempted to assess the likelihood that the Site has been impacted by a hazardous material/waste release, potential sources of impact may have escaped detection for reasons that include, but are not limited to: 1) inadequate or inaccurate information rightfully provided to SCS by third parties, such as public agencies and other outside sources; 2) the limited scope of this Assessment; and 3) the presence of undetected, unknown, or unreported environmental releases.

7 LIKELIHOOD STATEMENTS

Statements of “likelihood” have been made in this report. Likelihood statements are based on professional judgments of SCS. The term “likelihood,” as used herein, pertains to the probability of a match between the prediction for an event and its actual occurrence. The likelihood statement assigns a measure for a “degree of belief” for the match between the prediction for the event and the actual occurrence of the event.

The likelihood statements in this Report are made qualitatively (expressed in words). The qualitative terms can be approximately related to quantitative percentages. The term “low likelihood” is used by SCS to approximate a percentage range of 10 to 20 percent; the term “moderate likelihood” refers to an approximate percentage range of 40 to 60 percent; and the term “high likelihood” refers to an approximate percentage range of 80 to 90 percent.

Appendix I

Draft National Historic Preservation Act Section 106 Programmatic Agreement

PROGRAMMATIC AGREEMENT
AMONG THE
U.S. ARMY CORPS OF ENGINEERS, CENTRAL VALLEY FLOOD PROTECTION BOARD,
WEST SACRAMENTO AREA FLOOD CONTROL AGENCY, AND
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER,
REGARDING THE
SOUTHPORT SACRAMENTO RIVER EARLY IMPLEMENTATION PROJECT,
YOLO COUNTY, CALIFORNIA

WHEREAS, the West Sacramento Area Flood Control Agency (WSAFCA) proposes to implement the Southport Sacramento River Early Implementation Project (project, as described in Attachment A: *Description of the Project and U.S. Army Corps of Engineers Undertakings*); and

WHEREAS, this project requires authorization from the U.S. Army Corps of Engineers (the Corps) to modify federal levees under Section 14 of the River and Harbors Act (33 US Code Section 408) and a permit to discharge fill to waters of the United States under Section 404 of the Clean Water Act (33 US Code Section 1344), and these actions constitute undertakings requiring compliance with Section 106 of the National Historic Preservation Act (NHPA) (16 US Code Section 470f); and

WHEREAS, the Corps must comply with Section 106 for this project because 408 authorization and 404 permits are considered federal undertakings; and

WHEREAS, the Corps cannot feasibly perform all Section 106 compliance steps in advance of 408 authorization, which will occur once for the entire project in advance of construction and identification of all ancillary features such as borrow sites, and the Section 106 regulations allow a federal agency to phase management steps if provided for in a programmatic agreement (36 CFR Part 800.4[b][2]); and

WHEREAS, the Corps has chosen to prepare this programmatic agreement (Agreement) to ensure that cultural resources that may be affected by the undertakings are identified, such resources are evaluated for the National Register of Historic Places (NRHP), and any adverse effects caused by these undertakings are resolved prior to construction of project features; and

WHEREAS, the Corps has consulted with and will continue to consult with both federally recognized and other Native American tribes; and

WHEREAS, the Corps has consulted with individuals, historical societies, and organizations; and

WHEREAS, in accordance with 36 CFR Part 800.2(b), the Advisory Council on Historic Preservation (ACHP) has been invited to participate in consultation and this Agreement, and the ACHP has declined in a letter [**Corps provide date when available**]; and

WHEREAS, the Corps has consulted with the State Historic Preservation Officer (SHPO) in accordance with 36 CFR Part 800, (the regulations implementing Section 106 of the National Historic Preservation Act of 1966 [16 U.S.C. 470f]); and

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WHEREAS, WSAFCA has invited the Central Valley Flood Protection Board (CVFPB) to concur in this agreement because the CVFPB authorizes modifications to affected levees (California Water Code Section 8710); and

WHEREAS, the Corps has prepared, and will revise as necessary, a research design and historic property management plan (Attachment B, *Historic Properties Management Plan* [HPMP]) that will be used to guide inventory and management of historic properties;

NOW THEREFORE, the Corps, the SHPO, and WSAFCA agree that upon the Corps' decision to proceed with the undertaking, the following stipulations will be implemented for all portions of the project dependent on these undertakings, in accordance with this Agreement and the attached *HPMP* in order to take into account the effects of the undertakings on historic properties; and further agree that these stipulations shall govern the undertakings and all activities occurring under these undertakings that may affect historic properties, until this Agreement expires or is terminated.

STIPULATIONS

Stipulation I. Applicability and Scope, Relationship to Other Agreements

(A) Applicability and Scope

1. This Agreement applies to all portions of these undertakings that would not occur but for authorization from the Corps, which therefore consists of an undertaking as defined in 36 CFR Part 800.16(y), and must comply with Section 106 of the NHPA.

2. The Corps is responsible for ensuring compliance with all Section 106 responsibilities under the provisions of this Agreement because the Corps is responsible for reviewing and approving the project under both Section 14 of the Rivers and Harbors Act and Section 404 of the Clean Water Act.

3. A *Historic Properties Management Plan* (HPMP) will be prepared and submitted as a supporting document to the Agreement. On every anniversary of the execution of the Agreement, the HPMP will be reviewed by the Corps to determine if any additions or revisions are required. If the Corps determines that the HPMP requires an amendment, the Corps shall prepare and submit the Draft Amended HPMP to the signatory and concurring parties for a 45-day review and comment period. The Corps will consider comments and prepare the Amended HPMP, which will be considered binding through this Agreement.

(B) Conflicts with Other Agreement Documents

1. Because levees and flood control activities are regulated at many levels, it is possible that a conflict may arise between this Agreement and other agreement documents that govern associated undertakings. The Corps will endeavor to avoid conflicts with other agreement documents, but in the event of a direct conflict, the Corps will determine which agreement governs the activity associated with the conflict. For the purposes of the project, WSAFCA will only be responsible for implementing the terms of this Agreement.

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2. This Agreement does not negate or supersede any agreements governing the project area or vicinity, between Corps and Indian tribes in effect at the time the Agreement is executed, nor does it negate or supersede any agreement documents executed within the project area or vicinity between the Corps and the SHPO pursuant to 36 CFR Part 800. If any agreement between the Corps and Indian Tribes or between the Corps and the SHPO in effect at the time the agreement is executed is found to be in conflict with this Agreement, the respective signatories will confer to resolve the conflict. If the resolution results in a proposed amendment to this Agreement, the provisions under Stipulation VIII, Amendments, will be followed.

(C) Responsibilities

1. WSAFCA assumes responsibility for performing technical work necessary to satisfy Section 106, subject to the review and approval of the Corps. While carrying out this responsibility, WSAFCA agrees to seek the Corps' timely review of all technical management work to ensure that the work is both sufficient and does not exceed the requirements of Section 106.

Stipulation II. Definitions

1. The definitions set forth at 36 CFR Part 800.16 are applicable throughout this Agreement.

2. "HPMP" as used in this document, refers to the attached *Historic Properties Management Plan*. This document provides methodology covering inventory, recording of resources, evaluation and treatment of identified resources, curation of recovered materials, and other technical specifications necessary to implement this Agreement. The research design provided as part of this HPMP is designed to provide significance themes for historic-era and prehistoric resources that may be identified, and to consider these resources in relation to regional research domains.

Stipulation III. Notices and Communications

1. The signatory parties agree that reports and deliverables, such as inventory reports, findings of effect, and management plans prepared by WSAFCA and the Corps, will be submitted in hard copy to other signatory parties for review. All decisions from the SHPO, such as concurrence regarding evaluations, findings of effect, and adequacy of treatment, will be delivered in hard copy and retained by WSAFCA and the Corps.

Stipulation IV. Inventory and Evaluation of Historic Properties

(A) Phasing of Management Steps

1. WSAFCA has completed preliminary cultural resource inventories of a portion of the overall project area depicted in Figure 1 and included in Attachment A, in order to identify the likely presence of historic properties in the project area, as required under 36 CFR Part 800.4(b)(2). The project area depicted in this attachment represents the maximum extent of the geographic area in which construction may affect historic properties for the project as currently understood.

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2. Because the project will be constructed in at least 2 calendar years, with development of the proposed design and project area for the first year's work preceding the second year, it is not feasible to complete all identification and evaluation of historic properties in advance of federal permits and authorizations. The Corps will therefore collaborate with and direct WSAFCA to perform the following steps for discrete phases or activities identified by WSAFCA and the Corps, according to the construction schedule or timeline of the larger project, as authorized in 36 CFR Part 800.4(b)(2).

3. For each project phase or activity, WSAFCA will consult with the Corps and the SHPO to define an area of potential effects (APE) for the relevant project phase or activity, complete an inventory of the APE, evaluate identified resources for the NRHP, make a finding of effect, and develop treatment methods to reduce adverse effects where feasible.

(B) Definition of the Area of Potential Effects for Each Phase or Activity

1. WSAFCA and the Corps will define an APE for each phase or discrete activity. This document will be submitted to the SHPO for review prior to completing inventory of the phase- or activity-specific APE. The SHPO will have 30 calendar days to review and provide comments on the proposed APE, commencing upon receipt of the proposed APE. The APE will be deemed complete and adequate for a particular phase when the SHPO concurs by letter or electronic mail. Corps/WSAFCA will retain copies of SHPO concurrence to document such concurrence. Project changes may require revisions to the APE for a particular phase or activity. Revised APE maps may be submitted as part of addendum inventory reports, or as stand-alone documents. Revised APE maps shall be subject to the same 30 calendar day SHPO review period.

(C) Inventory of the Area of Potential Effects

1. WSAFCA will complete an inventory of cultural resources within each phase- or activity-specific APE, using methods identified in the attached HPMP. The inventory will cover the entire APE and will be designed to identify historic properties prior to construction, using methods appropriate to the nature of resources that may be encountered.

2. The Corps will ensure that all identification activities conform to the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, Standards for Identification (Federal Register 48 [190]:44720-44723).

(D) Evaluation and Finding of Effect

1. For all identified cultural resources, WSAFCA will prepare an evaluation for the NRHP, consistent with the methods and standards in the attached HPMP. WSAFCA will apply the criteria for evaluation for the NRHP provided in 36 CFR Part 60.4 and make an explicit finding of effect in the inventory report, describing the anticipated effect of the project phase on resources eligible or recommended as eligible for the NRHP, by applying the criteria of adverse effect consistent with 36 CFR Part 800.5(a)(1).

2. Based upon the inventory of each phase- or activity-specific APE, WSAFCA will also provide recommendations for construction monitoring. These recommendations will be based upon relevant factors such as the density and distribution of identified resources, geomorphology, recommendations from Native Americans, historic maps, and other relevant information.

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3. When previously evaluated properties are identified within the APE for a specific project phase or activity, the Corps District Archaeologist or professionally qualified designee will review those previous evaluations. The passage of time, changing perceptions of significance, new information, incomplete or flawed previous evaluations, and factual errors warrant such reviews and may prompt the Corps to reevaluate the properties. The Corps will consult with Indian tribes during the review and reevaluation process when properties are involved to which Indian tribes may attach religious or cultural significance.

(a) If the Corps, after reconsidering NRHP eligibility or formal listing or determination by the Secretary of the Interior or SHPO, agrees with the previous determination, the Corps may assume that the previous NRHP evaluation remains valid for the purposes of this Agreement. No consultation with the signatory parties is required under such circumstances.

(b) If the Corps disagrees with the previous NRHP eligibility or formal listing or determination by the Secretary of the Interior or SHPO, then the Corps will evaluate the property in accordance with the attached HPMP and will make such evaluation available for review as required under this Agreement.

(E) Resolution of Adverse Effects

1. For all identified historic properties subject to adverse effects, WSAFCA and the Corps will develop and implement treatment to resolve adverse effects where feasible. Treatment may consist of measures that entirely avoid adverse effects, documentation, data recovery excavations, preservation in place, or other methods identified by WSAFCA in consultation with the Corps. WSAFCA may use treatment methods provided in the attached HPMP or may develop property-specific treatment as necessary. If methods described in the HPMP are appropriate for necessary treatment, WSAFCA and the Corps may refer to those methods in the inventory report, finding of effect document, or stand-alone management plan and incorporate them by reference without repeating the full text of the relevant treatment methods.

(F) Review of Reports

1. Reports describing the results of inventory, evaluation, findings of effect and proposed management will be submitted to the SHPO for review after the Corps is provided the opportunity to review administrative drafts of these documents. WSAFCA or the Corps will also distribute reports to consulting and signatory parties upon request. WSAFCA and the Corps may only combine inventory, evaluation, and findings of effect management steps in one document submitted for SHPO review. The SHPO will have thirty (30) calendar days to review reports prepared under this stipulation, commencing upon receipt of the relevant report. Revised reports requiring additional SHPO review will follow the same review clock.

2. Proposed treatment plans addressing mitigation for adverse effects will be submitted in a separate report to SHPO for a thirty (30) day review and comment period, when treatment options identified in the HPMP are not sufficient to resolve adverse effects.

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(G) Ongoing Consultation with Native American Individuals and Organizations

1. WSAFCA and the Corps have solicited comments from the Native American community during development of this Agreement document. During management milestones, such as completion of inventory reports, resource evaluations, findings of effect, and development and implementation of treatment, upon a request for consultation, WSAFCA and the Corps will consult with any Native American party that attaches cultural significance to resources subject to management. Such consultation may include both federally recognized tribes and other tribes, organizations, and individuals that may attach cultural significance to resources affected by relevant undertakings. WSAFCA and the Corps will consider the input of these organizations and individuals in good faith and attempt to incorporate and follow suggestions regarding management of cultural resources where feasible.

Stipulation V. Monitoring and Inadvertent Discoveries and Unanticipated Effects

(A) Workforce Training and Construction Monitoring

1. Qualified archaeologists retained by WSAFCA will provide training to construction personnel so that construction personnel may take necessary actions to protect inadvertent discoveries. "Qualified" as used in this stipulation means archaeologists that meet the Secretary of the Interior's Standards for Archaeology and Historic Preservation (48 Federal Register 44716). This training will cover both the identification of resources that may be encountered during construction and procedures to be followed in the event of a discovery.

2. Qualified archaeologists retained by WSAFCA will monitor construction where necessary to ensure that identified resources are protected or where there is a high sensitivity for previously unidentified resources, as prescribed in each phase- or activity-specific inventory report and the attached HPMP. The location, frequency, and staffing levels for monitoring activities are subject to approval by the Corps through the review of the monitoring recommendations in the reports required above in Stipulation IV.

(B) Discovery Procedures for Resources Encountered During Construction

1. If cultural resources are discovered during construction, all construction will immediately stop within 100 ft. (30 m) of the discovery, and the location of the discovery will be marked for avoidance. The contractor must notify the Corps and WSAFCA (if no representatives are on location). WSAFCA, in consultation with the Corps, will determine whether the discovery is a potential NRHP-eligible resource by evaluating the resource per the criteria in 36 CFR Part 60.4. If WSAFCA and the Corps determine that the discovery is not an NRHP-eligible resource, the discovery will be documented and construction may proceed at the direction of the Corps and WSAFCA.

2. If WSAFCA and the Corps determine that the discovery may be eligible for the NRHP, WSAFCA and the Corps will notify the SHPO and other relevant parties as early as feasible. Notification should include a description of the discovery, the circumstances leading to its identification, and recommendations for further action. Where feasible, the notification will also include a tentative NRHP-eligibility recommendation per 36 CFR Part 60.4 and a finding of effect per 36 CFR Part 800.5(a)(1). If the resource cannot be evaluated based upon available evidence (for example, where test excavation is

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required),WSAFCA and the Corps will use testing and evaluation methods provided in the attached HPMP for further technical work necessary to determine the eligibility of the resource and make a finding of effect per 36 CFR Part 800.5(a)(1). For NRHP-eligible resources subject to adverse effects, treatment will be implemented where necessary to resolve adverse effects on inadvertently discovered historic properties. The SHPO will have 30 calendar days to review reports describing the evaluation, finding of effect, and proposed treatment of inadvertent discoveries.

3. If human remains are discovered during construction, WSAFCA and the Corps will follow California Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98. In addition, WSAFCA and the Corps will consider and implement, to the extent feasible, the principles adopted in the ACHP *Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects*[1]. Relevant principles included in the policy statement include, but are not limited to, respectful treatment of human remains, disturbance of such remains only when necessary, and early consultation with affiliated tribes to manage such resources.

Stipulation VI. Administrative Provisions for Implementation of this Agreement

(A) Professional Qualifications

1. All inventory and evaluation activities prescribed by this Agreement will be carried out under the direct supervision of a person or persons meeting, at a minimum, the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738–44739) in the appropriate disciplines. Nothing in this stipulation, however, may be interpreted to preclude WSAFCA or the Corps or any agent or contractor thereof from using the services of persons who do not meet the Secretary of Interior's Professional Qualifications Standards if they are supervised by an individual who does meet these standards.

(B) Documentation Standards

1. Written documentation of inventory, evaluations, findings of effect, and treatment prescribed per this Agreement will conform to the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716–44740), as well as to applicable standards and guidelines established by the SHPO and the HPMP. All documentation that supports findings and determinations made under this Agreement shall be consistent with 36 CFR Part 800.11. Documentation prepared by local or state agencies or their consultants in support of such findings shall be submitted to the Corps for review and approval by the Corps District Archaeologist or appropriately supervised Corps staff.

(C) Curation Standards

1. WSAFCA and the Corps will ensure that the materials and records resulting from the activities prescribed in this Agreement are curated in accordance with 36 CFR Part 79, except where state law and regulations, including, but not limited to, California Public Resources Code Sections 5097.98 and 5097.991 for Native American human remains and associated grave goods discovered on non-federal land require different treatment. Additionally, the disposition of any abandoned shipwrecks and

[1] 2007. Advisory Council on Historic Preservation. *Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects*.

archaeological sites and historic resources on state lands under the jurisdiction of the California State Lands Commission (CSLC) will be determined by CSLC as provided by California Public Resources Code Section 6313, which states that title to shipwrecks and submerged cultural resources in submerged lands is vested in the state. WSAFCA the Corps will ensure that, to the extent permitted by applicable laws and regulations, the views of the appropriate Native American descendant group(s) are taken into consideration when decisions are made about the disposition of Native American archaeological materials and records.

(D) Reporting Requirements

1. For each calendar year in which cultural resource management activities are performed under this Agreement, WSAFCA and the Corps will submit to the SHPO a yearly summary report or memorandum documenting management milestones and reports delivered for that calendar year. This report or memorandum will be prepared and delivered to the SHPO by January 30 for the prior calendar year.

(E) Confidentiality

1. The parties to this Agreement acknowledge that historic properties covered by this Agreement are subject to the provisions of Section 304 of the NHPA and California Government Code 6254.10 (Public Records Act) relating to the disclosure of archaeological site information and, having so acknowledged, will ensure that all actions and documentation prescribed by this Agreement maintain the confidentiality required by law.

Stipulation VII. Resolving Objections

(A) Methods for Resolving Objections

1. Should any signatory party object in writing to the Corps regarding the manner in which the terms of this Agreement are carried out, the Corps will immediately notify the other signatory parties of the objection and proceed to consult with the objecting signatory party to resolve the objection. The Corps will honor the request of any other signatory party to participate in the consultation and will take any comments provided by such signatory party into account. The Corps will render a decision regarding the objection and respond to the objecting party within 30 calendar days of receipt by the Corps of the objection. The Corps will promptly notify the other signatory parties of its decision in writing, including a copy of the response to the objecting party. A Corps decision regarding resolution of the objection will be final. Following issuance of its final decision, the Corps may authorize the action subject to dispute hereunder to proceed in accordance with the terms of that decision.

(B) When Objections Cannot Be Resolved

1. If after initiating such consultation, the Corps determines that the objection cannot be resolved through consultation, the Corps will forward all documentation relevant to the objection to the ACHP, including a proposed response from the Corps, if any, to the objection. Within 30 calendar days after receipt of all pertinent documentation, ACHP will exercise one of the following options:

(a) Advise the Corps that ACHP concurs within the proposed response to the objection, whereupon the Corps will respond to the objection accordingly; or

(b) Provide the Corps with recommendations, which the Corps will take into account in reaching a final decision regarding its response to the objection.

(c) Where the objection relates to resolution of adverse effects, notify the Corps that the objection will be referred for comment pursuant to 36 CFR Part 800.7 and proceed to refer the objection for further review and comment. In this event, the Corps shall take the resulting comments into account in accordance with 36 CFR Part 800.7 et seq.

2. Should the ACHP not exercise one of the options above within 30 calendar days after receipt of all pertinent documentation, the Corps may assume ACHP's concurrence in its proposed response to the objection.

3. The Corps will take into account any ACHP recommendation or comment and any comments from the other signatory parties to this Agreement in reaching a final decision regarding the objection. The responsibility of the Corps to carry out all actions under this Agreement that are not the subject of the objection will remain unchanged.

4. The Corps will provide all other signatory parties to this Agreement with a written copy of its final decision (including any ACHP comments) regarding any objection addressed pursuant to this stipulation.

Stipulation VIII. Amendments

(A) Methods for Amending This Agreement

1. Any signatory party to this Agreement may propose that this Agreement be amended, whereupon the signatory parties will consult for no more than thirty (30) calendar days to consider such amendment. The Corps may extend this consultation period by notifying the other signatories in writing, by letter or electronic means. The amendment process shall comply with 36 CFR Part 800.6(c)(1) and Part 800.6(c)(7), as programmatic agreements for multiple undertakings are governed by this part as indicated in 36 CFR Part 800.14(b)(3). This Agreement may be amended only upon the written agreement of the signatories.

(B) Failure to Reach Agreement

1. If the signatory parties cannot reach agreement on proposed amendments, the dispute will be resolved by consultation with the ACHP, and the ACHP will have the power to cast a vote to break any tie or create a simple majority required under Stipulation VIII(A) above.

Stipulation IX. Termination

(A) Termination

1. Only signatory parties to this Agreement may terminate this Agreement. If any signatory party proposes to terminate this agreement, that party will notify the other signatory parties in writing, explain the reasons for proposing termination, and consult with the other parties for no more than 30 calendar days to seek alternatives to termination.

2. Should such consultation result in an agreement on an alternative to termination, the signatories will proceed in accordance with that agreement and, if necessary, will amend the Agreement in accordance with Stipulation VIII.

3. Should such consultation fail to result in an agreed upon resolution by the signatory parties, the signatory party proposing termination may terminate this Agreement by promptly notifying the other signatories in writing.

4. Should this Agreement be terminated, the Corps shall either consult in accordance with 36 CFR Part 800.14(b) to develop a new Agreement or request the comments of ACHP pursuant to 36 CFR Part 800.

5. Beginning with the date of termination, the Corps shall ensure that, until and unless a new Agreement is executed for the undertakings covered by this Agreement, such undertakings shall be considered separate actions to be reviewed individually in accordance with 36 CFR Parts 800.4-800.6.

Stipulation X. Duration of the Agreement

1. Unless it is terminated pursuant to Stipulation IX of this Agreement or superseded by another agreement executed for the covered undertakings, this Agreement will remain in effect until the Corps, in consultation with the other signatory parties to this Agreement, determines that construction, monitoring, and maintenance of all aspects of the undertakings have been completed and all terms of this Agreement have been fulfilled in a satisfactory manner; or until ten (10) years have passed from the date of execution of this Agreement, whichever comes first. Upon a determination by the Corps that construction, monitoring, and maintenance of all aspects of the covered undertakings have been completed and that all terms of this Agreement have been fulfilled in a satisfactory manner, or upon reaching the ten (10) year limit, the Corps will notify the other signatory and concurring parties of this determination in writing, whereupon this Agreement will be null and void.

Stipulation XI. Effective Date

1. This Agreement will take effect on the date that it has been executed by all signatory parties.

EXECUTION and implementation of this Agreement is evidence that the Corps has afforded ACHP a reasonable opportunity to comment on this Agreement and the associated undertakings; that the Corps has taken into account the effects of the undertakings on historic properties; and that the Corps has complied with Section 106 of the NHPA and 36 CFR Part 800 sufficiently to satisfy Section 106 for those undertakings dependent upon Section 106 compliance.

ATTACHMENTS

Attachment A, *Description of the Project and U.S. Army Corps of Engineers Undertakings*

Attachment B, *Historic Properties Management Plan*

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SIGNATORY PARTIES:

U.S. Army Corps of Engineers

By _____ Date _____
William J. Leady, P.E.
Colonel, U.S. Army
District Commander

California State Office of Historic Preservation

By _____ Date _____
Carol Roland-Nawi, Ph.D.
State Historic Preservation Officer

West Sacramento Area Flood Control Agency

By _____ Date _____
Michael Bessette
Flood Protection Manager

CONCURRING PARTIES:

Central Valley Flood Protection Board

By _____ Date _____
Jay Punia
Executive Officer

DRAFT

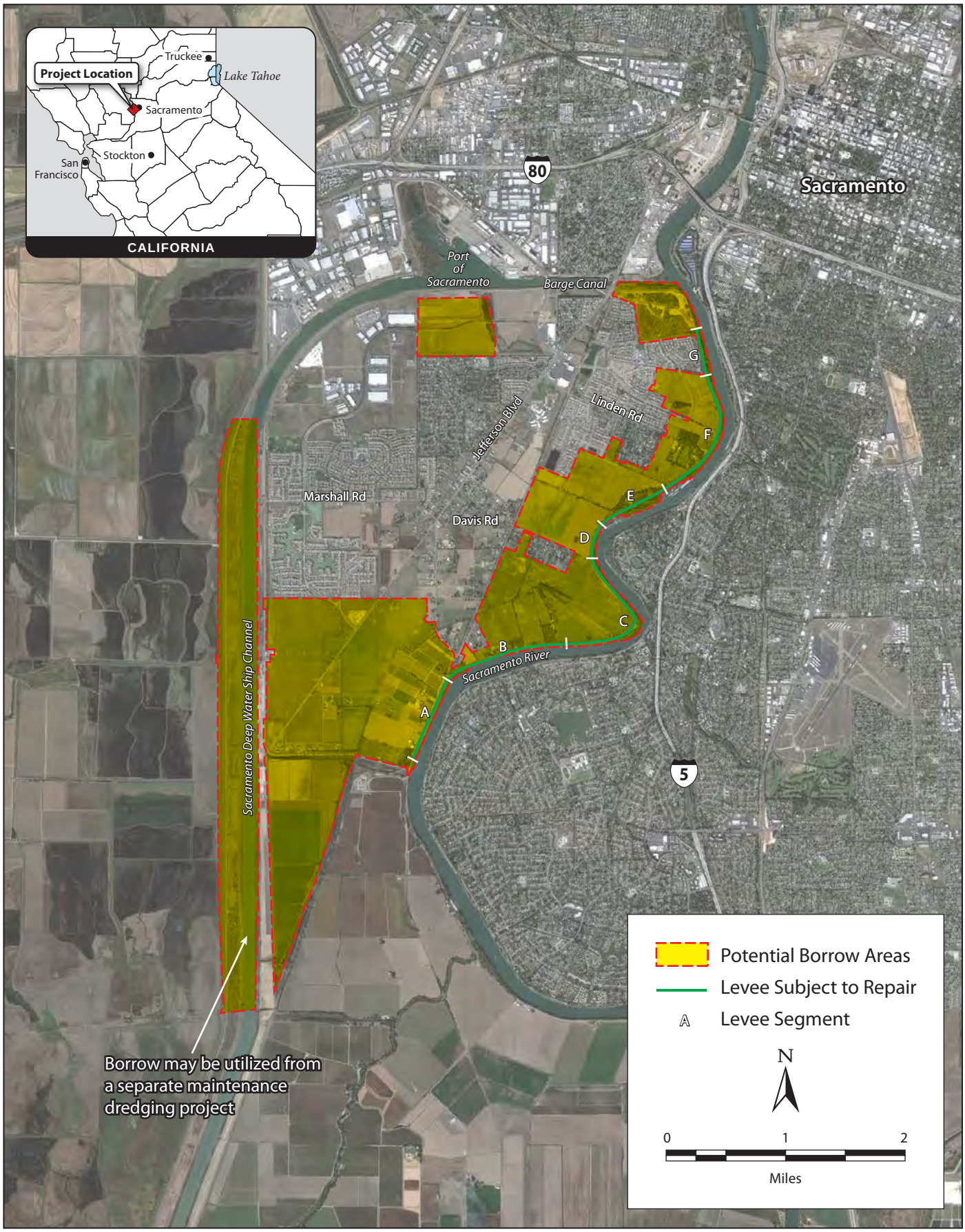

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Figure 1
Project Vicinity

Attachment A

Southport Sacramento River Early Implementation Project: Description of the Project and U.S. Army Corps of Engineers Undertakings

A.1 Introduction

This attachment provides information to support the programmatic agreement prepared to guide management of cultural resources for the Southport Sacramento River Early Implementation Project. Relevant sections include a detailed description of the proposed project and associated actions that require compliance with Section 106 of the National Historic Preservation Act (NHPA).

A.2 Project Description

The West Sacramento Area Flood Control Agency (WSAFCA) is proposing the Southport Sacramento River Early Implementation Project ("Southport project," or simply "project") to construct flood risk–reduction measures along the Sacramento River South Levee in the city of West Sacramento, Yolo County, California. The project is targeted at providing 200-year protection for urbanized areas. The primary purpose of the Southport project is to reduce flood risk for the entire city of West Sacramento by addressing known levee deficiencies along the Southport reach. Secondary purposes of the Southport project are to provide ecosystem restoration and public recreation opportunities that are compatible with flood risk–reduction measures. The primary purpose has top priority for project planning, implementation, operations, and maintenance. The project would incrementally reduce localized flood risk for the reach of the levee at which measures are proposed, in turn reducing risk for the entire city. The location of the project in relation to the surrounding region and levee reaches where construction would occur are depicted in Figure 1.

While the Southport project would not by itself reduce all flood risks affecting the planning area, it would address the most immediate risk based on the following.

- The Sacramento River West Levee is the longest and most contiguous portion of the planning area perimeter.
- The location of known levee deficiencies and the clarity and feasibility of available measures to address them.
- The proposed improvements associated with each levee reach (described below in Table 1).

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Table 1. Construction by Segment and Year (Two-Year Construction Window)

Segment	Year	Proposed Flood Risk Reduction Measures
A	2	Adjacent levee, slurry cutoff wall, and rock slope protection
B	2	Adjacent levee, slurry cutoff wall, and rock slope protection
		Adjacent levee, slurry cutoff wall, landside seepage berm, and rock slope protection
		acent levee, landside seepage berm, and rock slope protection
		Setback levee and landside seepage berm
C	1	Setback levee and landside seepage berm
D	1	Setback levee and slurry cutoff wall
E	1	Setback levee, landside seepage berm, and slurry cutoff wall
F	1	Adjacent levee, and landside seepage berm
		Adjacent levee, landside seepage berm, and rock slope protection
G	1	Adjacent levee, slurry cutoff wall, and rock slope protection

Construction would occur in more than one annual construction season (typically April 15 to October 31, subject to conditions), with construction of Segments C, D, E, F, and G preceding construction of Segments A and B. Construction of the first segments would take place during the first construction season (Year 1). Construction of the Segments A and B would take place during the second construction season (Year 2). Because the proposed improvements will also require borrow material, WSAFCA is considering a range of locations in the immediate vicinity where suitable borrow material may be acquired. These areas are depicted in yellow on Figure 1. It should be noted that Figure 1 depicts all locations under consideration; however, once a feasible source of borrow is identified, the actual footprint of borrow activity will be substantially smaller. For each construction year or other discrete action that forms a portion of the larger project, WSAFCA and the U.S. Army Corps of Engineers will complete the Section 106 management steps described in the programmatic agreement to which this description is attached. The need for compliance with Section 106 of the NHPA is described below.

A.3 National Historic Preservation Act, Section 106 Undertakings

The project requires permits and authorizations from the U.S. Army Corps of Engineers under Section 14 of the Rivers and Harbors Act (33 U.S. Code [USC] Section 408), Section 404 of the Clean Water Act (33 USC Section 1344), and Section 10 of the Rivers and Harbors Act (33 USC Section 403). Because activities authorized under these permits and approvals may affect historic properties, compliance with Section 106 of the National Historic Preservation Act (NHPA, 16 USC Section 470f) is required. The programmatic agreement, attached research design, and *Historic Property Treatment Plan* ("Plan," Attachment B), provide a means of phasing completion of Section 106 management steps for these undertakings.

Attachment B

Southport Sacramento River Early Implementation Project Historic Properties Management Plan

This report is under preparation and contains confidential information. A redacted version will be prepared and released with the Final EIS/EIR.