3.3 Human Use Characteristics

3.3.1 Land Use

This section describes the evaluation of potential impacts on local and regional planning in California. Land uses, housing conditions, and land use goals and policies of local jurisdictions in the study area are discussed.

3.3.1.1 Baseline Conditions

All counties and cities in California are required to develop and adopt a General Plan, which functions as a blueprint for short- and long-term community goals and policies for development and conservation. As part of a General Plan, counties are required to discuss (among other elements) their land use and housing elements. Land use is defined as a description of how land or a water area is occupied or used (Dolnic and Davidson 1999). Land uses could include residential, commercial, industrial, recreational, agricultural, or a specific development such as private and public highways, road and stream construction, or drainage construction (Dolnic and Davidson 1999). California Public Resources Code (PRC) Section 65302a mandates that a General Plan's land use element designate "…the proposed general distribution and general location and extent of the uses of the land for housing, business, industry, open space, including agriculture, natural resources, recreation, and enjoyment of scenic beauty, education, public buildings and grounds, solid and liquid waste disposal facilities, and other categories of public and private uses of land." PRC Section 65583 requires that a General Plan's housing element consist of "…an identification and analysis of existing and projected housing needs and a statement of goals, policies, quantified objectives and scheduled programs for the preservation, improvement and development of housing."

At a regional level, the Association of Bay Area Governments (ABAG) is the land use planning agency for the nine San Francisco Bay area counties, including two counties (Contra Costa and Solano) within the study area. The ABAG is responsible for allocating regional housing needs, describing existing conditions, forecasting changes to the population and economy, and assisting local governments with identifying policies that address a changing environment.

In general, the study area is primarily used for agriculture, with several notable residential and industrial developments in concentrated areas. Most of the information provided in this section was obtained from General Plans of affected jurisdictions including Contra Costa, Sacramento, Solano, and Yolo counties, as well as the cities of Rio Vista and West Sacramento. The geographic divisions of the study area's reaches do not necessarily correspond with county or city boundaries. Reaches 1, 2, 3, and the southern portion of Reach 4 are located fully or partially within the cities of Rio Vista, Pittsburg, or Collinsville

and in Solano, Sacramento, or Contra Costa counties. The larger northern portion of Reach 4 and all of Reach 5 are located in Yolo County and parts are also in the City of West Sacramento. For this reason, the land use and housing discussions for Reaches 1, 2, 3, and the southern portion of Reach 4 are combined, and the discussions for the northern portion of Reach 4 and all of Reach 5 are combined.

Figure 29 illustrates land use by the major categories of agriculture; commercial, residential, and mixed use; and parks/open space. Figure 30 illustrates land use based on the general land uses within the study area.

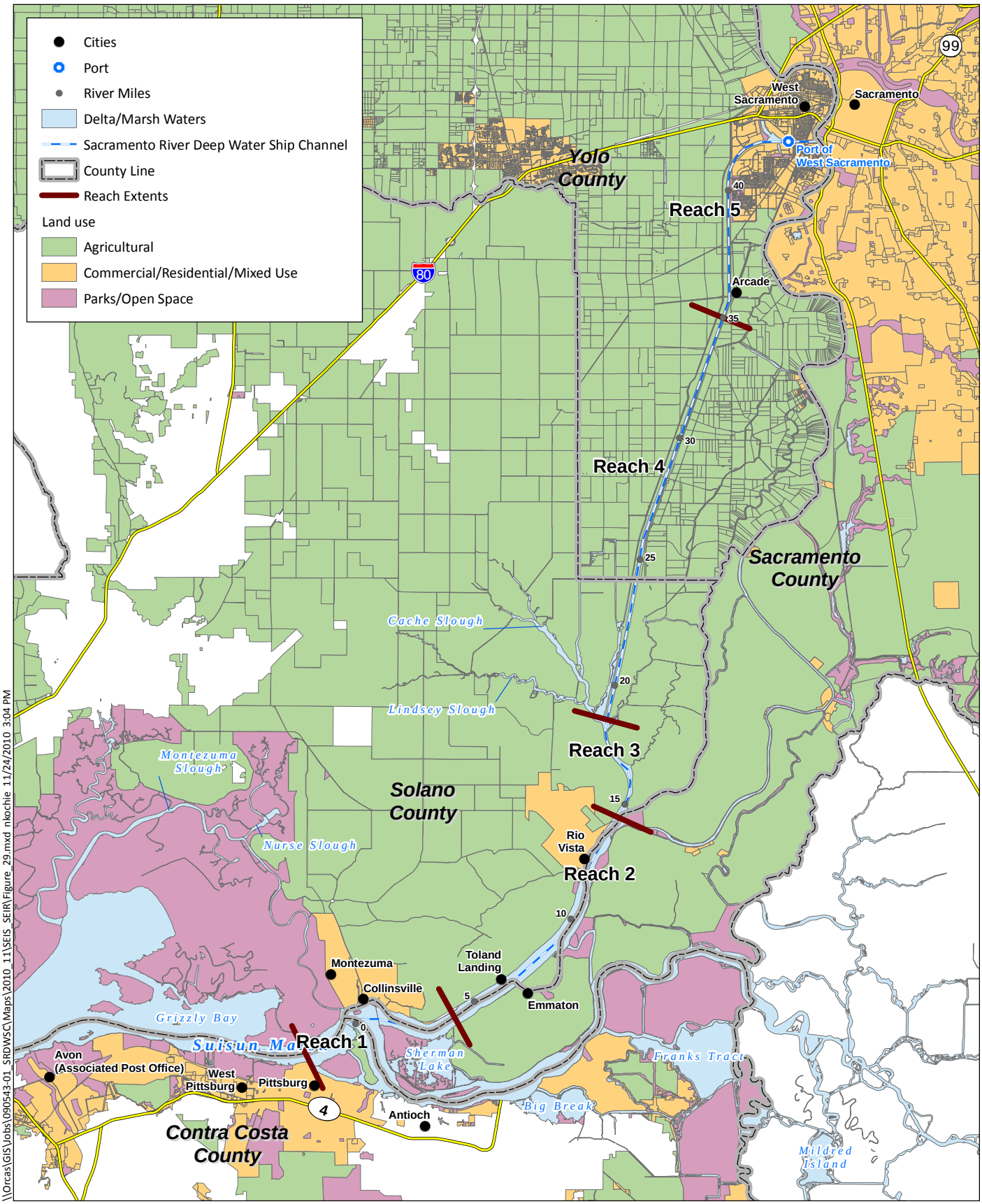
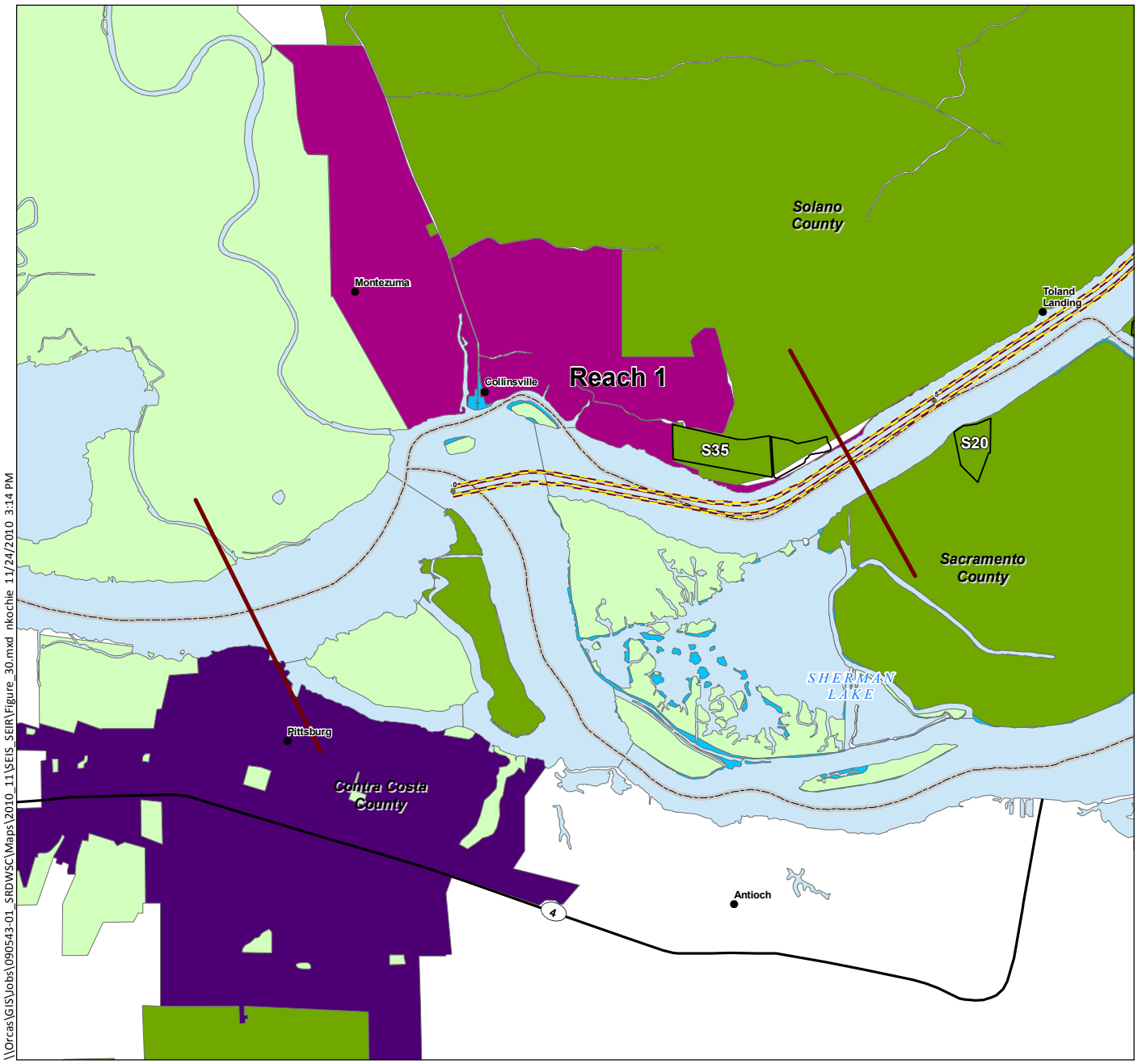


Figure 29
Land Use Overview
SEIS/SEIR
Sacramento River Deep Water Ship Channel

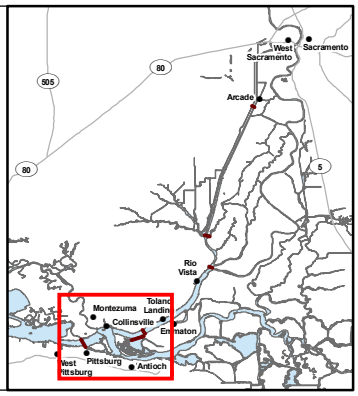


General Plan/Zoning

- Agriculture
- Commercial
- Industrial
- Mixed Use
- Open Space
- Public and Quasi-Public
- Residential

- Cities
- Reach Extents
- Proposed Channel
- Existing Channel
- Major Roads
- County Line
- Delta/Marsh Waters
- Placement Sites

Sources:
1. Contra Costa County - http://www.ccmap.us/default.asp
2. City of West Sacramento http://www.cityofwestsacramento.org/services/gis/
2. Sacramento County - http://www.msa.saccounty.net/gis/
3. Solano County - http://www.co.solano.ca.us/depts/doit/gis/default.asp
4. Yolo County - http://www.yolocounty.org/Index.aspx?page=823



Miles
0 0.75 1.5 2.25 3

N

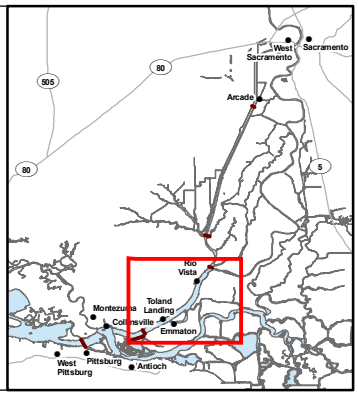
Figure 30a
General Plans/Zoning within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

General Plan/Zoning

- Agriculture
- Commercial
- Industrial
- Mixed Use
- Open Space
- Public and Quasi-Public
- Residential

- Cities
- Reach Extents
- Proposed Channel
- Existing Channel
- Major Roads
- County Line
- Delta/Marsh Waters
- Placement Sites

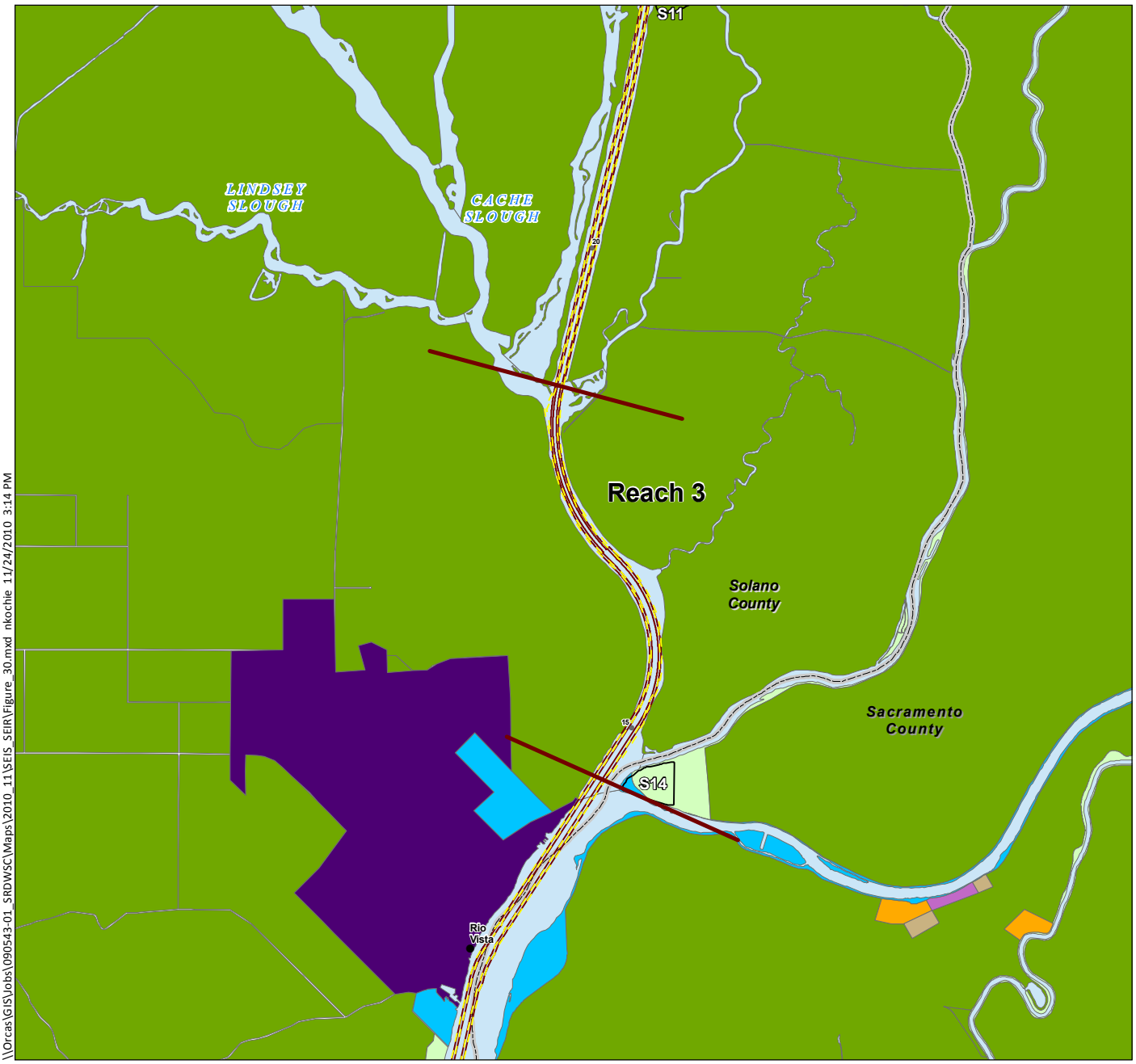
Sources:
1. Contra Costa County - http://www.ccmap.us/default.asp
2. City of West Sacramento http://www.cityofwestsacramento.org/services/gis/
2. Sacramento County - http://www.msa.saccounty.net/gis/
3. Solano County - http://www.co.solano.ca.us/depts/doit/gis/default.asp
4. Yolo County - http://www.yolocounty.org/Index.aspx?page=823



Miles
0 0.75 1.5 2.25 3

N

Figure 30b
General Plans/Zoning within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

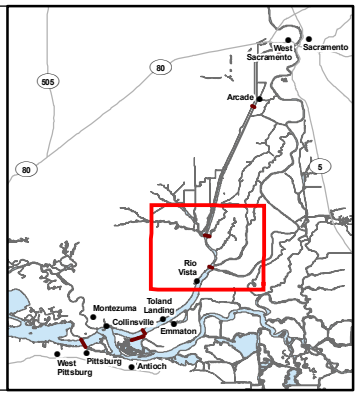


General Plan/Zoning

- Agriculture
- Commercial
- Industrial
- Mixed Use
- Open Space
- Public and Quasi-Public
- Residential

- Cities
- Reach Extents
- Proposed Channel
- Existing Channel
- Major Roads
- County Line
- Delta/Marsh Waters
- Placement Sites

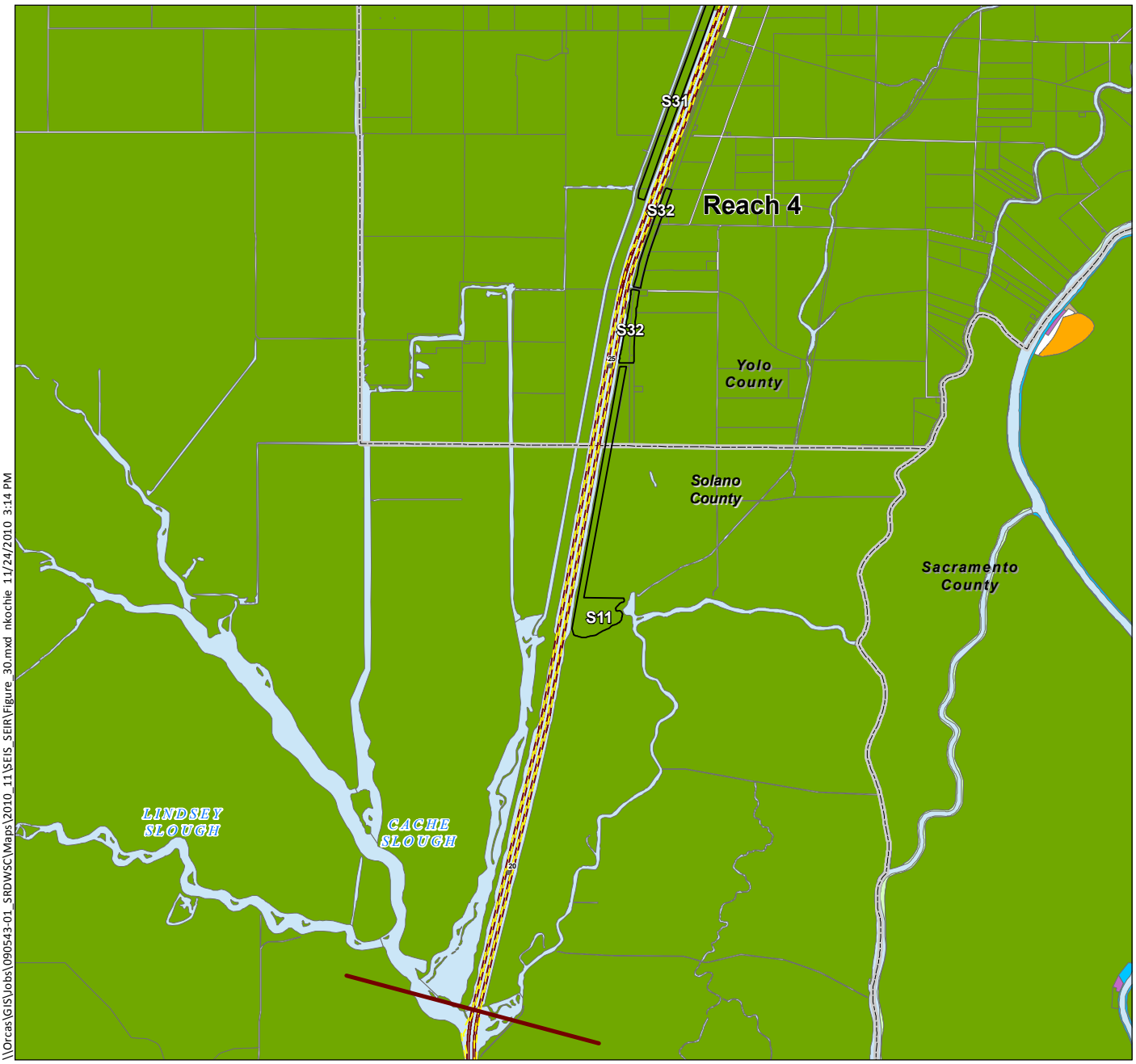
Sources:
1. Contra Costa County - http://www.ccmap.us/default.asp
2. City of West Sacramento http://www.cityofwestsacramento.org/services/gis/
2. Sacramento County - http://www.msa.saccounty.net/gis/
3. Solano County - http://www.co.solano.ca.us/depts/doit/gis/default.asp
4. Yolo County - http://www.yolocounty.org/Index.aspx?page=823



Miles
0 0.75 1.5 2.25 3

N

Figure 30c
General Plans/Zoning within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

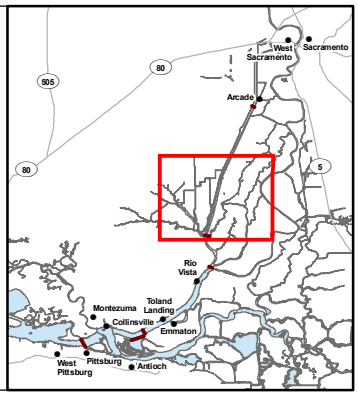


General Plan/Zoning

- Agriculture
- Commercial
- Industrial
- Mixed Use
- Open Space
- Public and Quasi-Public
- Residential

- Cities
- Reach Extents
- Proposed Channel
- Existing Channel
- Major Roads
- County Line
- Delta/Marsh Waters
- Placement Sites

Sources:
1. Contra Costa County - http://www.ccmap.us/default.asp
2. City of West Sacramento http://www.cityofwestsacramento.org/services/gis/
2. Sacramento County - http://www.msa.saccounty.net/gis/
3. Solano County - http://www.co.solano.ca.us/depts/doit/gis/default.asp
4. Yolo County - http://www.yolocounty.org/Index.aspx?page=823



Miles
0 0.75 1.5 2.25 3

N

Figure 30d
General Plans/Zoning within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

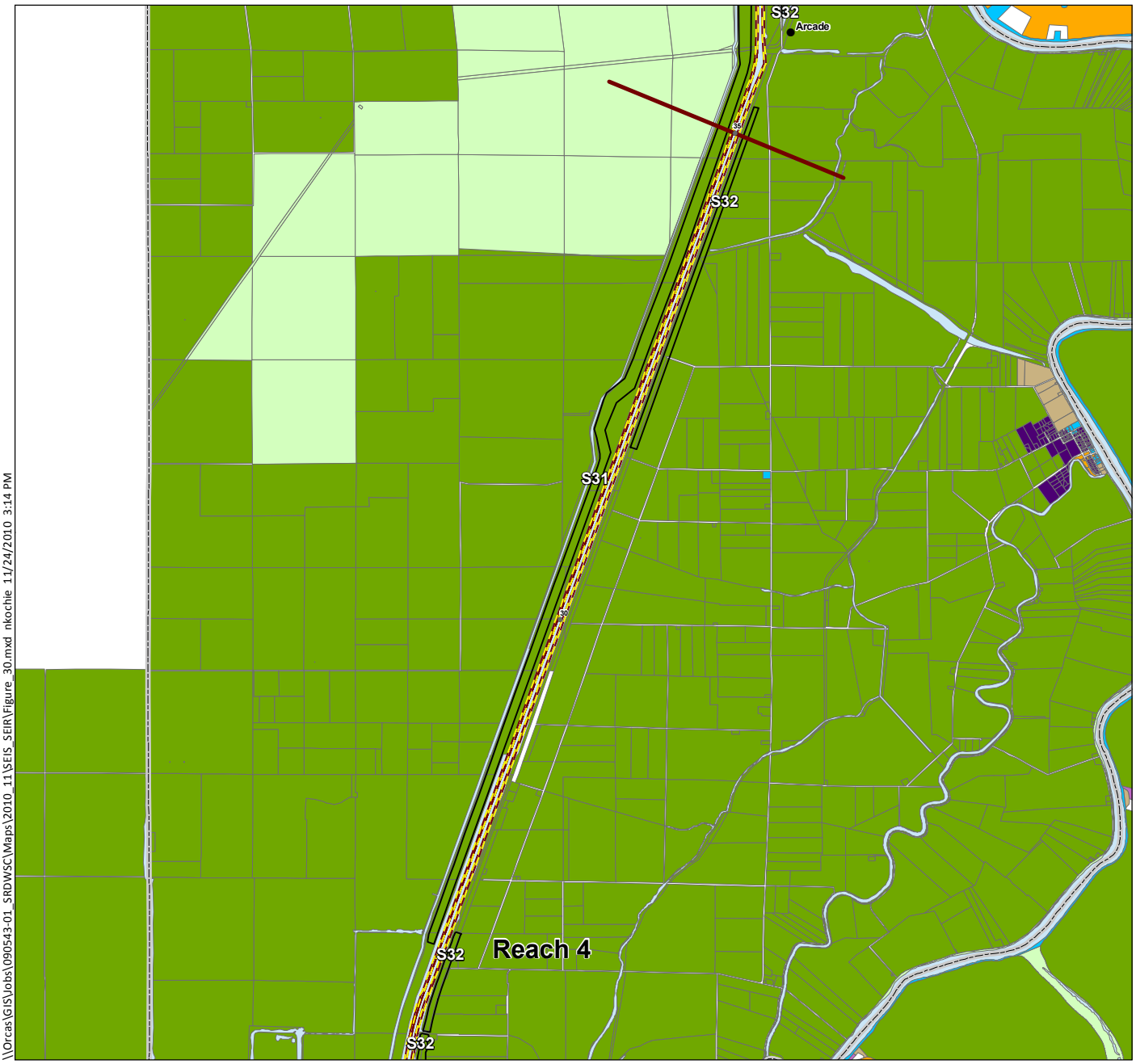


Figure 30e
General Plans/Zoning within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

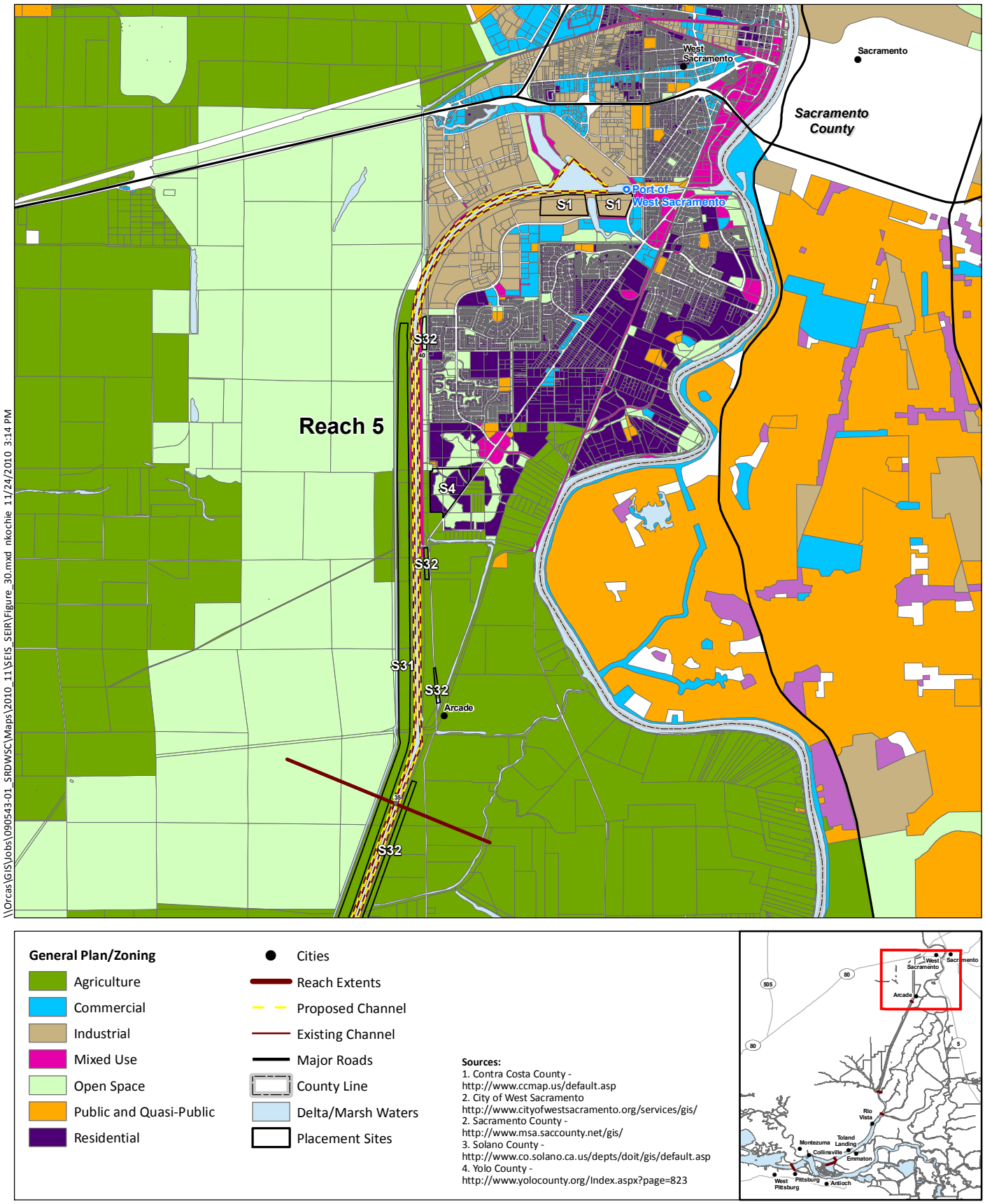


Figure 30f
General Plans/Zoning within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

The westernmost extent of Reach 1 is within Contra Costa County, where existing land uses are primarily industrial and residential. The Contra Costa County General Plan designates the shoreline within the study area as open space, park, heavy industry, public/semi-public, residential, commercial, and commercial recreation (Contra Costa County 2005). The Concord Naval Weapons Station comprises 7,630 acres of the tidal area between the cities of West Pittsburg and Avon, the study area's westernmost extent. In Pittsburg, land uses are industrial, residential, and commercial, including a 575-slip municipal marina. Plans are underway to redevelop the marina area, adding commercial space and hotels. The Pittsburg residential community located along Heron Drive and Pelican Loop abuts an inlet and features private backyard boat docks.

According to the 22nd United States Census in 2000, 2,496 people reside in the census tract containing the study area in Pittsburg, with a median age of 36.5 years. At the time of the census, a total of 1,003 housing units were located in the census tract (U.S. Census Bureau 2000a).

Reaches 1 through 4 are partially or completely located within Solano County. The study area to the north/northwest of the SRDWSC from Suisun Bay to approximately the southern extent of the man-made portion of the navigation channel is located in Solano County. In 1994, Solano County adopted the Orderly Growth Initiative to ensure protection of agricultural and open-space resources by placing restrictions on their re-designation and on residential or mixed-use development outside of municipal areas. A popular vote is required to re-designate agricultural and open space lands to another land use category or to increase the density of development on such lands (Solano County 2008a).

The Solano County General Plan (2008a) identifies the City of Collinsville as a Special Study Area. Solano County, in coordination with Collinsville community members, is in the process of evaluating a range of concepts for different land use patterns in the community, including water-dependent industry, agriculture, energy production, and residential development. Current land uses in Collinsville include natural resource wetland area, utility operations, publicly owned open land, wind farms, residential, and agricultural lands. Dry farming, which rotates between grain and grazing sheep, is the major agricultural practice in this area. Much of the land used for dry farming is also used for production of wind energy. Pacific Gas and Electric (PG&E) and the Sacramento Municipal Utility District each own large tracts of land in the Collinsville area. A cluster of fewer than 20 homes is located near the water along Collinsville Road (Solano County 2007).

Continuing north in Solano County, the study area is designated agricultural until it enters the City of Rio Vista. The portion of Rio Vista closest to the SRDWSC is located within the

study area, where it is designated urban residential and urban industrial. In Rio Vista, the study area encompasses both higher- and lower-end residential neighborhoods. South of the Rio Vista Bridge, the study area includes the city's oldest and most affluent neighborhood. North of the bridge, it includes a mobile home park with more than 50 units, which borders the city's industrial waterfront area (Rio Vista Chamber of Commerce 2009). Census 2000 tract data including the Solano County portion of the study area do not differentiate between the communities in Reaches 1 or 2 and includes areas far inland of the study area. The tract data indicate that 5,733 people reside in the greater Collinsville/Rio Vista area with a median age of 39 years. At the time of the census, a total of 2,377 housing units were located in the census tract (U.S. Census Bureau 2000b). The remainder of the study area located north of Rio Vista and within Solano County is designated resource conservation agricultural (Solano County 2008a).

The study area to the south and southeast of Reaches 1 and 2 is located within Sacramento County, where agriculture is the primary land use. In this area, Reaches 1 and 2 are located in what the Sacramento County General Plan (2007) identifies as the Delta Community. According to the Sacramento County General Plan, the study area within the Delta Community is not the focus of any land use or housing special planning efforts (Sacramento County 2009). The Delta Community is primarily designated as an agricultural open-space area, although small portions of Brannan Island, Ryer Island, and the islands near Middle and New York sloughs are zoned as critical natural open space areas. In addition, there are several residential clusters scattered throughout the greater community; however, very few residences are located in the portion of the study area that is within Sacramento County.

As is the case with Solano County, Census 2000 data for the Sacramento County study area do not differentiate between the communities found in Reaches 1 or 2, and the tract includes areas far inland of the study area. Census data indicate that 1,934 people reside in the greater Delta Community, with a median age of 46.5 years. At the time of the census, a total of 1,156 housing units were located in the census tract (U.S. Census Bureau 2000c).

The northern portion of Reach 4 and all of Reach 5 are located within Yolo County, and the northernmost portion of Reach 5 is also located within the city limits of West Sacramento. The Yolo County General Plan outlines primary land use goals, which include maintaining a range and balance of land uses, preserving agricultural investments, and ensuring the compatibility of Delta land uses with conservation and resource management efforts, among others. The General Plan also focuses on the preservation of Yolo County's rural character as a community character issue (Yolo County 2009). Most of the Yolo County study area outside of the City of West Sacramento is currently used for agricultural purposes.

Like Solano and Sacramento counties, the Census 2000 tract for the Yolo County study area includes areas far inland of the study area. Data on the census tract containing the Reach 4 study area within Yolo County indicate that 1,373 people reside in the area, with a median age of 36.7 years. At the time of the census, a total of 478 housing units were located in the census tract (U.S. Census Bureau 2000d).

The area to the west of the SRDWSC in Reach 5 is located entirely within the Yolo Bypass Wildlife Area (YBWA). The YBWA was established in 1991 and is managed by the California Department of Fish and Game (CDFG). It comprises approximately 16,770 acres of protected land that was, and continues to be, enhanced for wildlife species and to provide the public with compatible, wildlife-related recreational uses (CDFG 2007).

The area to the east of the SRDWSC in Reach 5 is located in West Sacramento, where the primary land uses within the study area are industrial (including the Port, a rail facility, many industrial buildings, and warehouses) and residential. In November 2007, the Port opened an area to the public east of the turning basin and west of the locks, called the Barge Canal Recreational Access. The public access facility features a vehicle parking area, an all-weather walking/biking trail, and fishing access along the south bank of the barge canal. In addition, the cities of Sacramento and West Sacramento are pursuing redevelopment plans in the "Stone Lock District," a riverfront area southeast of the Port near the abandoned locks (City of West Sacramento 2009b). South of the Port and east of the SRDWSC, the study area encompasses parts of the communities of Bridgeway Island, Bridgeway Lakes, and Bridgeway Lakes II. These areas have seen rapid growth over the past decade and are now established suburban neighborhoods with their own churches and schools (Tilley 2009; Dirksen 2009). Census 2000 data for the tract containing the Bridgeway study area indicate that 6,021 people reside in the area with a median age of 37.6 years. At the time of the census, a total of 2,227 housing units were located in the census tract (U.S. Census Bureau 2000e). Another residential community within the study area in West Sacramento is the Vahalla mobile home community located between the Port and Interstate 80 (I-80), which contains more than 200 homes. Census 2000 data for the tract containing the Vahalla study area indicate that 5,370 people reside in the area, with a median age of 29.5 years. At the time of the census, a total of 2,188 housing units were located in the census tract (U.S. Census Bureau 2000f).

3.3.1.1.1 Prime Farmland and Other Farmland Designations

Prime farmland represents a specific type of agricultural land established in federal legislation. Congress enacted the Agriculture and Food Act (Farmland Protection Policy Act [FPPA]) of 1981 7 USC 4201 et seq., with the intent of minimizing "the extent to which Federal programs contribute to the unnecessary (and irreversible) conversion of farmland to nonagricultural uses" (Farmland Information Center 2006). The law also stipulates that

federal programs be compatible with state, local, and private efforts to protect farmland (Farmland Information Center 2006).

Categories defined by the FPPA include the following:

- Prime farmland, which is defined as "land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion" (7 USC 4201(c)(1)(A))
- Unique farmland, which is defined as "land other than prime farmland that is used for the production of specific high-value food and fiber crops...such as, citrus, tree nuts, olives, cranberries, fruits, and vegetables" (7 USC 4201(c)(1)(B))
- Additional farmland of statewide or local importance, which is defined as "land identified by state or local agencies for agricultural use, but not of national significance" (7 USC 4201(c)(1)(C))

Prime and important farmlands were identified by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS; formerly the Soil Conservation Service) as a part of the Land Inventory and Monitoring (LIM) system (State of California Department of Conservation 2010). Within the state of California, this system was expanded and incorporated into the Farmland Mapping and Monitoring Program (FMMP) (State of California Department of Conservation 2007). Established in 1982, the FMMP is a non-regulatory program designed to assess the location, quality, and quantity of agricultural lands and conversion of these lands over time (State of California Department of Conservation 2007). This system identifies prime farmland as "land which has the best combination of physical and chemical characteristics for the production of crops" (State of California Department of Conservation 2010). FMMP also identifies farmland of statewide importance, which is "land other than prime farmland which has a good combination of physical and chemical characteristics for the production of crops" (State of California Department of Conservation 2010). Both classifications are based on specific soil criteria and use of the land for agricultural production during the two update cycles prior to the mapping date (State of California Department of Conservation 2010). Grazing lands and locally important farmlands are also identified as being of priority to the State (State of California Department of Conservation 2010). Farmland of local importance was defined as important to the local agricultural economy by each county's board of supervisors and a local advisory committee (State of California Department of Conservation 2007).

Figure 31 illustrates the various types of farmlands in the study area in relation to the proposed dredged material placement sites evaluated in this Draft SEIS/SEIR. In addition to showing prime farmland, unique farmland, farmland of statewide importance, grazing land,

and farmland of local importance, Figure 31 also shows the following (State of California Department of Conservation 2007):

- Farmland of local potential: land with soils that qualify for prime farmland or farmland of statewide importance, but that are generally not cultivated or irrigated
- Urban and built-up land: land occupied by structures with a building density of at least 1 unit to 1.5 acres and a combination of residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes
- Other land not included in any other mapping category that is typically vacant

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, enables local governments to enter into contracts with private landowners to restrict specific parcels of land to agricultural or related open space in return for subvention payments (State of California Department of Conservation 2007). Either party has the option to not renew or to cancel the arrangement. Figure 32 illustrates the Williamson Act contracted lands throughout the study area.

Prime farmland, farmland of statewide importance, unique farmland, grazing land, farmland of local importance, and Williamson Act contracted land designations within the ten evaluated dredged material placement sites are detailed in Table 47. Data were generated by comparing farmland designations in the FMMP with the proposed dredged material placement site boundaries using ArcGIS. This effort was based on the most recent map updates and downloaded for use in April 2010. The data for Sacramento County were last updated in 2006, and data for Solano and Yolo counties were updated in 2008. The actual acreage of farmlands affected by dredged material placement considers the sites' current usage and the portion of the sites that would undergo conversion—temporarily or permanently—to a nonagricultural use.

Table 47
Acreage of Farmland Designations for the Proposed Dredged Material Placement Sites

Placement Site	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Grazing Land	Farmland of Local Importance	Williamson Act Contracted Land
S1						
S4					111.48	
S11				40.30		40.30[a]
S14						
S16				132.12		
S19				161.47		173.27[b]
S20					63.69	

Placement Site	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Grazing Land	Farmland of Local Importance	Williamson Act Contracted Land
S31						
S32		0.77	1.09		18.26	2.60[a]
S35				199.93		

Source: FMMP (State of California Department of Conservation 2007) and (State of California Department of Conservation 2009)

Note: All values are in acres.

a Prime Williamson Act land

b Non-prime Williamson Act land

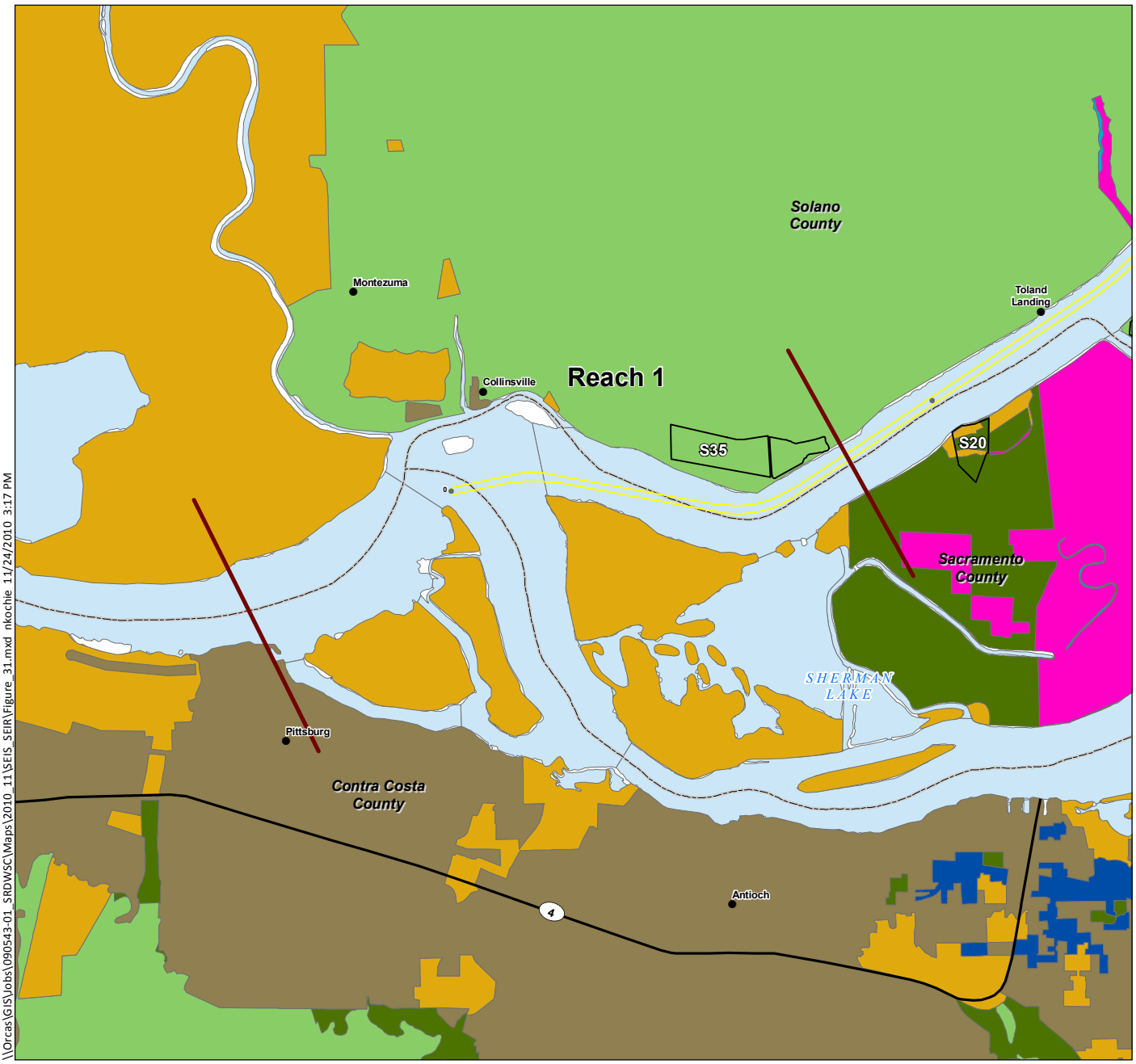


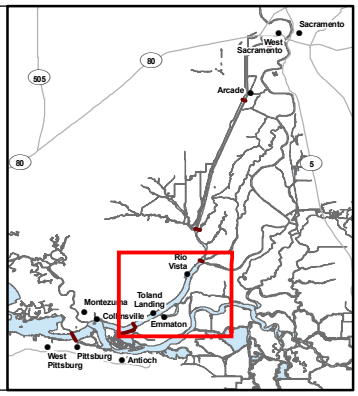
Figure 31a
Farmlands within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

Farmlands

- Farmland of Local Importance
- Farmland of Local Potential
- Farmland of Statewide Importance
- Grazing Land
- Other Land
- Prime Farmland
- Unique Farmland
- Urban and Built-Up Land

- Cities
- Major Roads
- Placement Sites
- County Line
- Delta/Marsh Waters

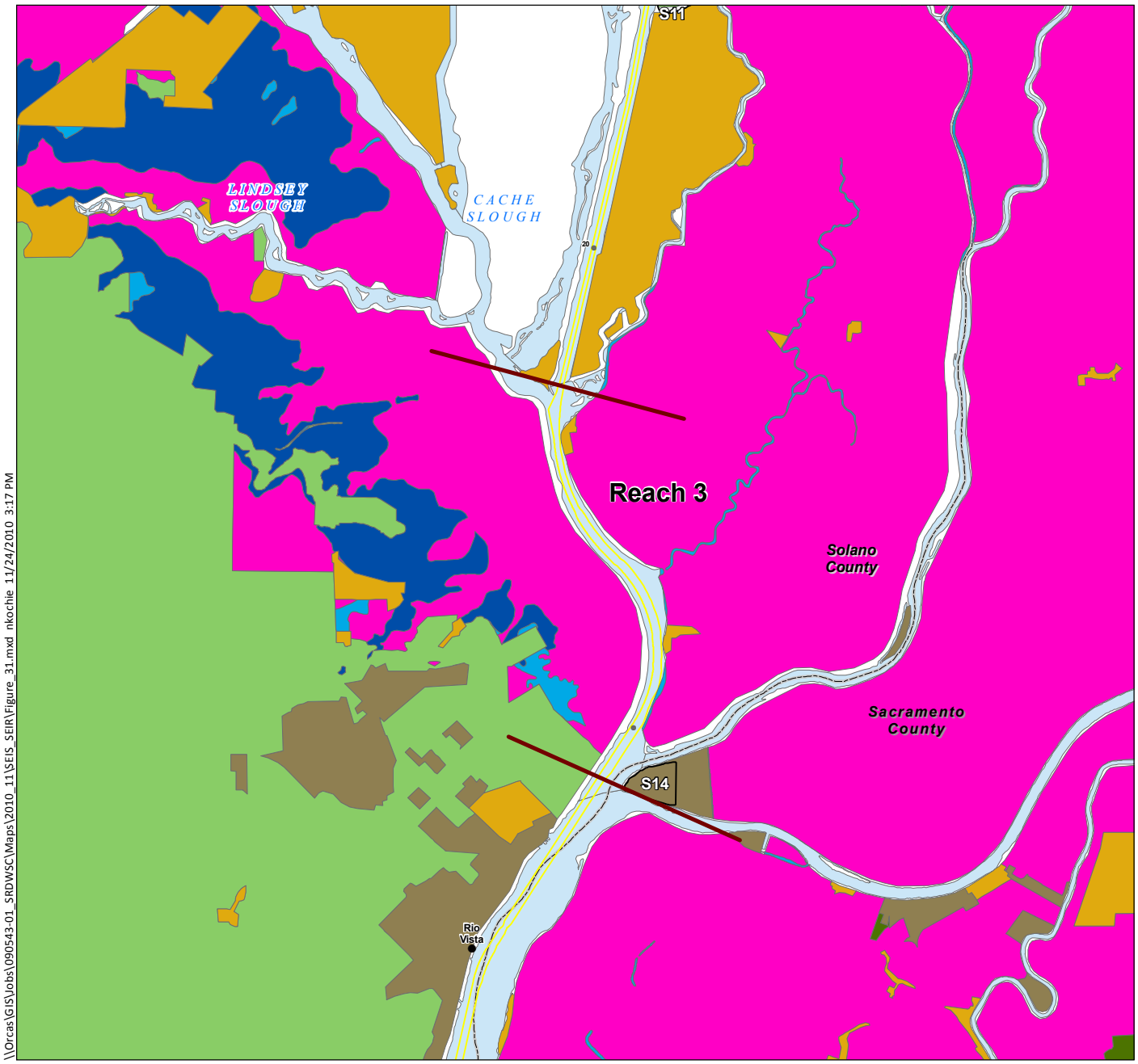
NOTES:
1. Source: California Department of Conservation.
2. Contra Costa, Solano, and Yolo County data from 2008.
3. Sacramento County data from 2006.



Miles
0 0.75 1.5 2.25 3

N

Figure 31b
Farmlands within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel



Farmlands

- Farmland of Local Importance
- Farmland of Local Potential
- Farmland of Statewide Importance
- Grazing Land
- Other Land
- Prime Farmland
- Unique Farmland
- Urban and Built-Up Land

- Cities
- Major Roads
- Placement Sites
- County Line
- Delta/Marsh Waters

NOTES:
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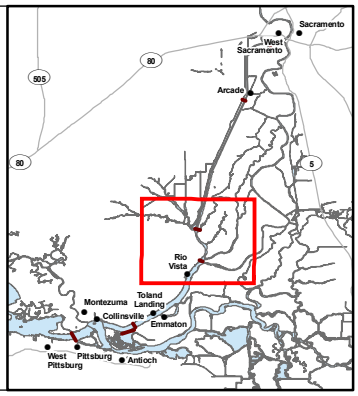
2. Contra Costa, Solano, and Yolo County data from 2008.
3. Sacramento County data from 2006.



Miles
0 0.75 1.5 2.25 3

N

Figure 31c
Farmlands within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

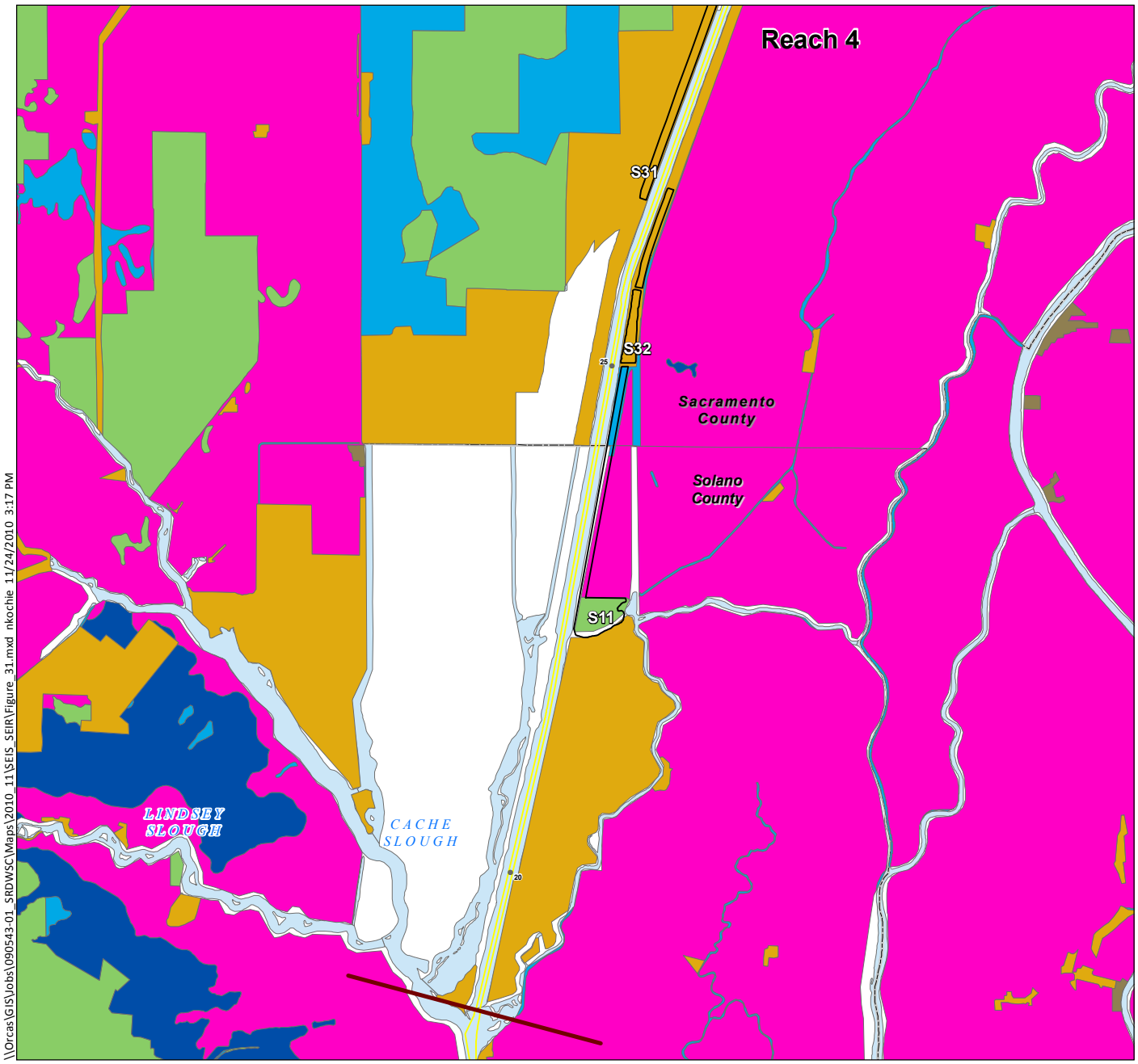
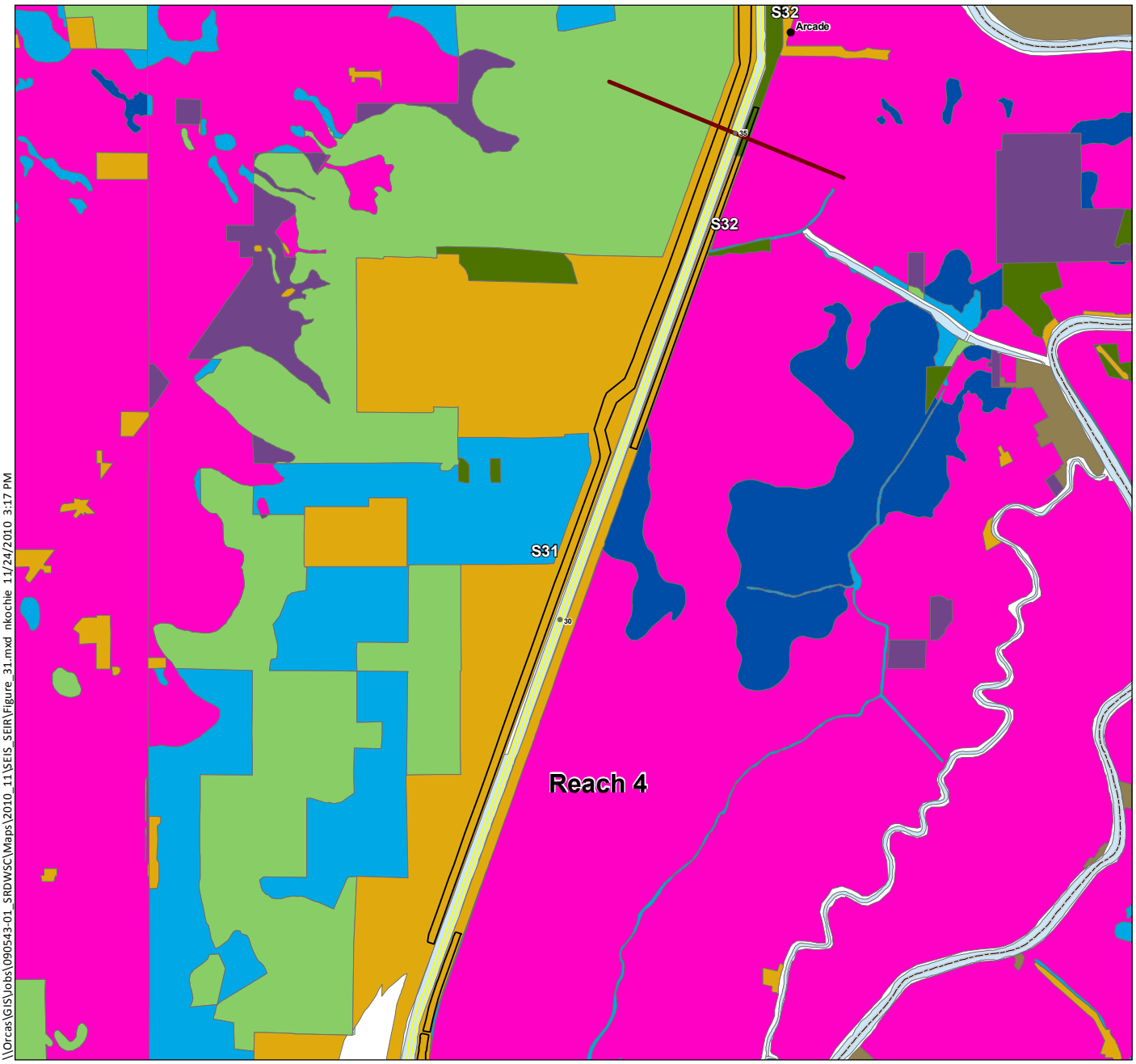


Figure 31d
Farmlands within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

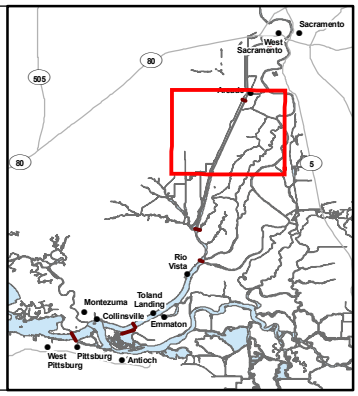


Farmlands

- Farmland of Local Importance
- Farmland of Local Potential
- Farmland of Statewide Importance
- Grazing Land
- Other Land
- Prime Farmland
- Unique Farmland
- Urban and Built-Up Land

- Cities
- Major Roads
- Placement Sites
- County Line
- Delta/Marsh Waters

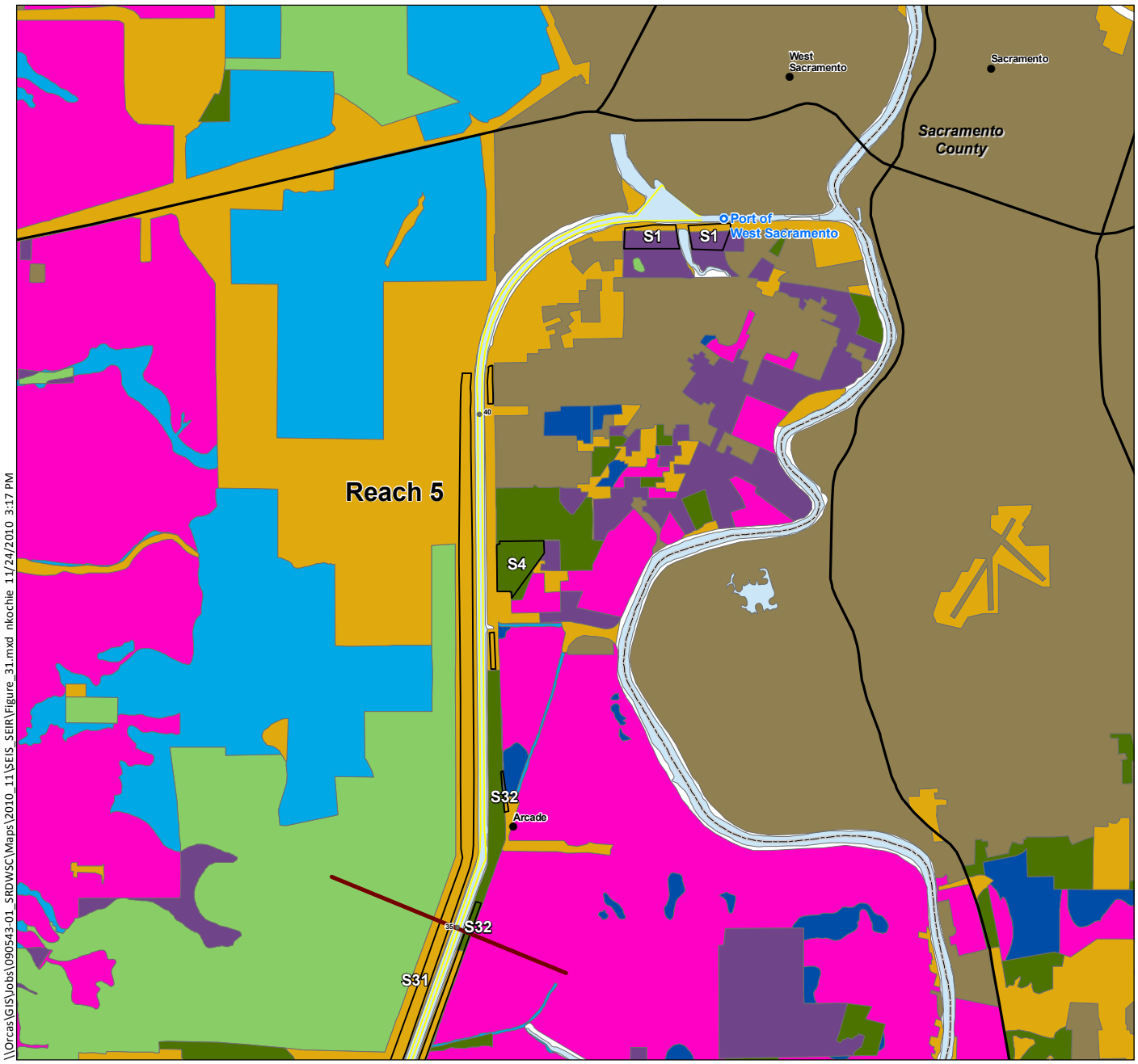
NOTES:
1. Source: California Department of Conservation.
2. Contra Costa, Solano, and Yolo County data from 2008.
3. Sacramento County data from 2006.



Miles
0 0.75 1.5 2.25 3

N

Figure 31e
Farmlands within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

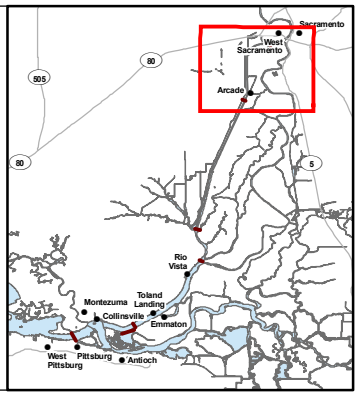


Farmlands

- Farmland of Local Importance
- Farmland of Local Potential
- Farmland of Statewide Importance
- Grazing Land
- Other Land
- Prime Farmland
- Unique Farmland
- Urban and Built-Up Land

- Cities
- Major Roads
- Placement Sites
- County Line
- Delta/Marsh Waters

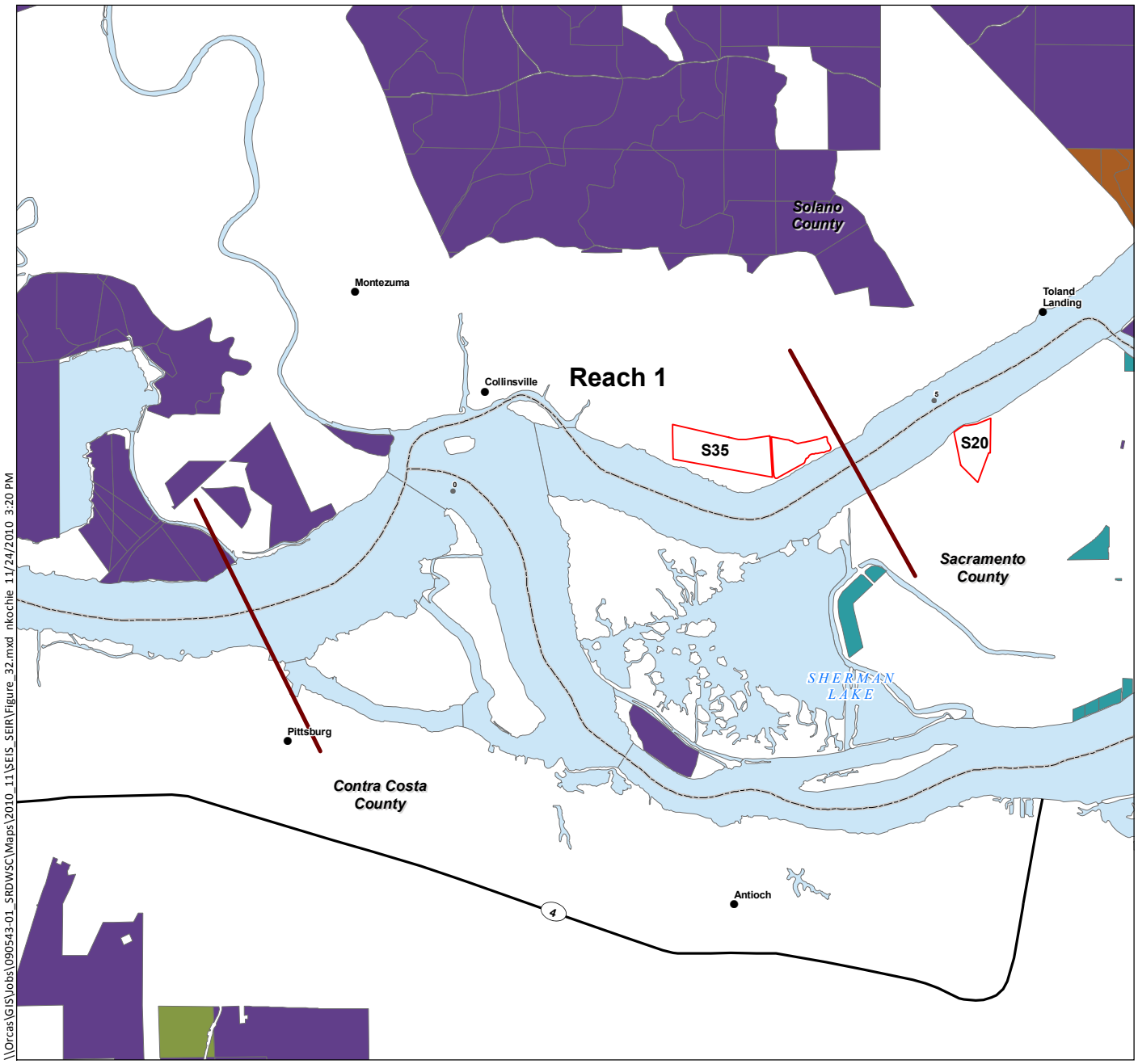
NOTES:
1. Source: California Department of Conservation.
2. Contra Costa, Solano, and Yolo County data from 2008.
3. Sacramento County data from 2006.



Miles
0 0.75 1.5 2.25 3

N

Figure 31f
Farmlands within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

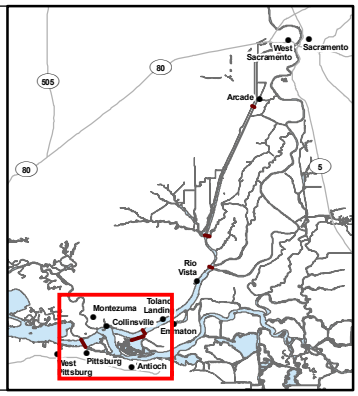


- Cities
- Major Roads
- Placement Sites
- County Line
- Delta/Marsh Waters

Williamson Act Parcels

- Mixed Enrolled
- Non-Prime
- Agricultural Easement
- Non-Renewal
- Prime

NOTES:
1. Source: California Department of Conservation.
2. Contra Costa, Solano, and Yolo County data from 2008.
3. Sacramento County data from 2006.



Miles
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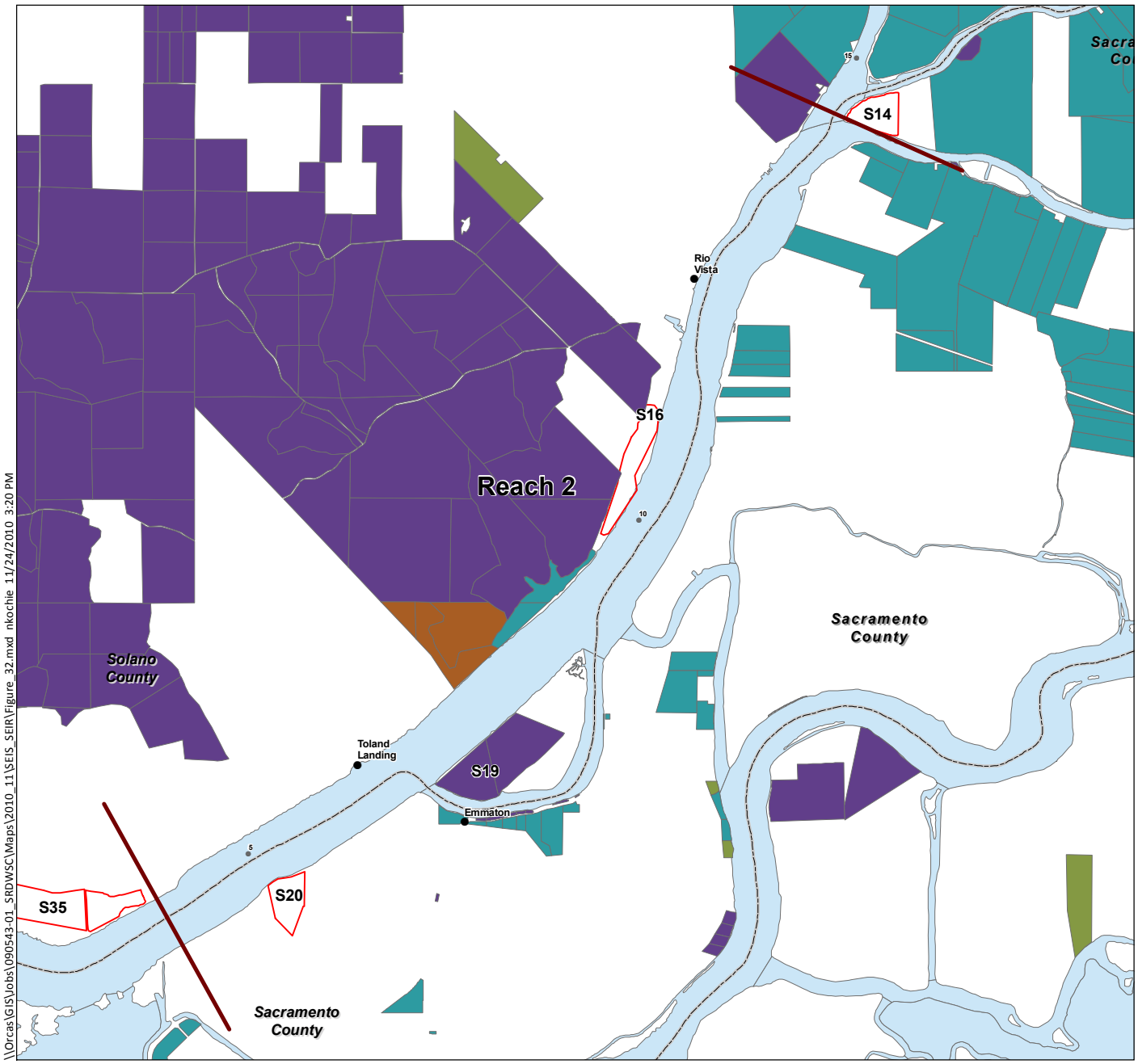
N

Figure 32a
Williamson Act Properties within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

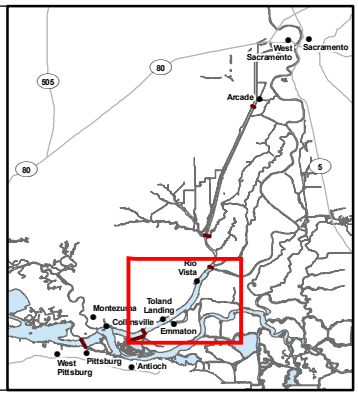


- Cities
- Major Roads
- Placement Sites
- County Line
- Delta/Marsh Waters

Williamson Act Parcels

- Mixed Enrolled
- Non-Prime
- Agricultural Easement
- Non-Renewal
- Prime

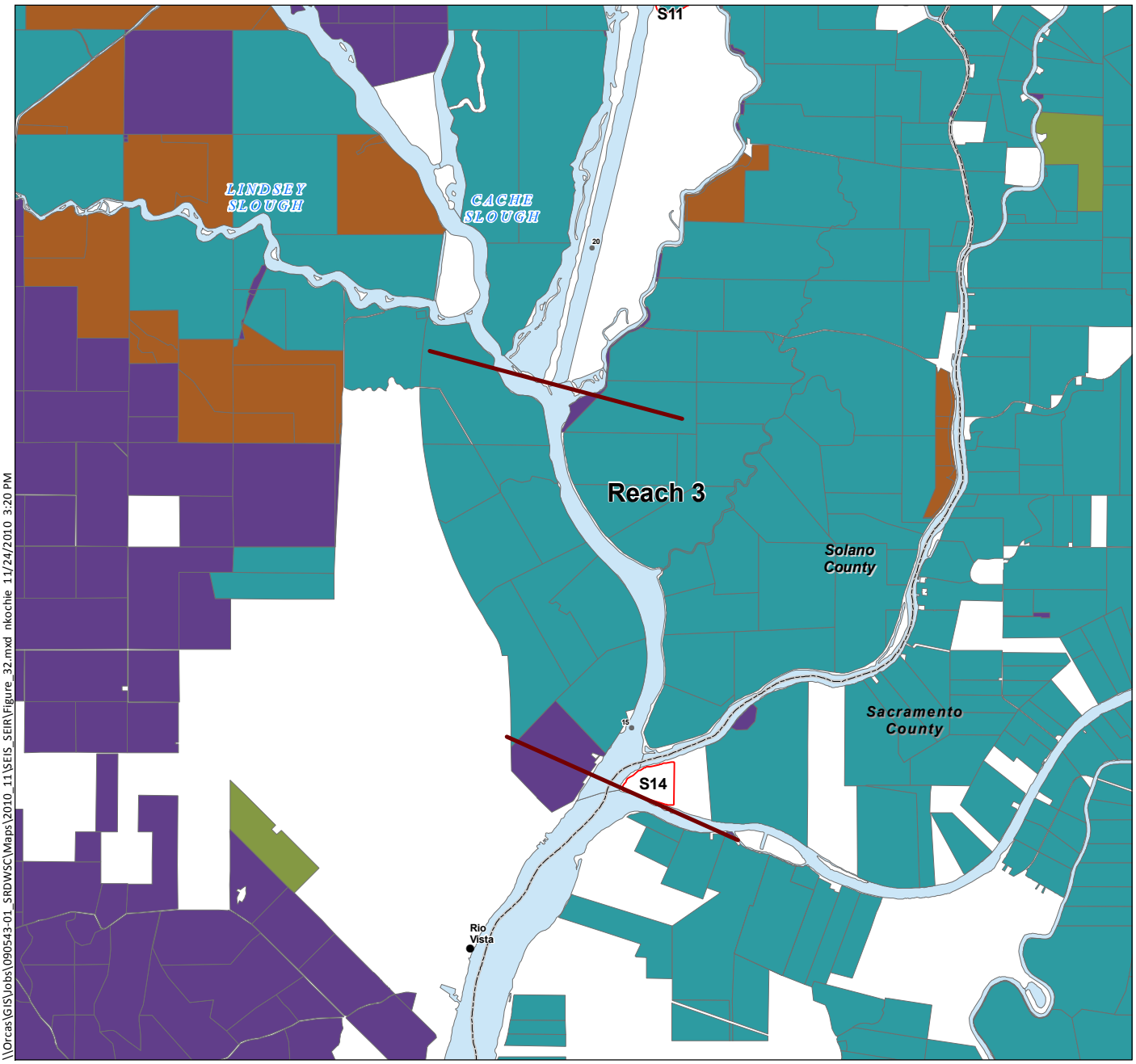
NOTES:
1. Source: California Department of Conservation.
2. Contra Costa, Solano, and Yolo County data from 2008.
3. Sacramento County data from 2006.



Miles
0 0.75 1.5 2.25 3

N

Figure 32b
Williamson Act Properties within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

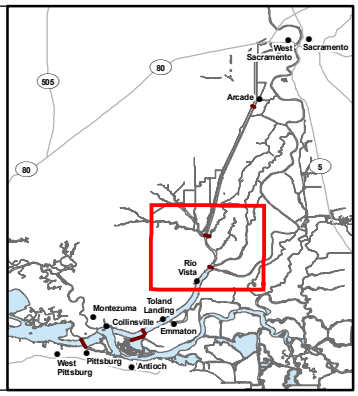


- Cities
- Major Roads
- Placement Sites
- County Line
- Delta/Marsh Waters

Williamson Act Parcels

- Mixed Enrolled
- Non-Prime
- Agricultural Easement
- Non-Renewal
- Prime

NOTES:
1. Source: California Department of Conservation.
2. Contra Costa, Solano, and Yolo County data from 2008.
3. Sacramento County data from 2006.



Miles
0 0.75 1.5 2.25 3

N

Figure 32c
Williamson Act Properties within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

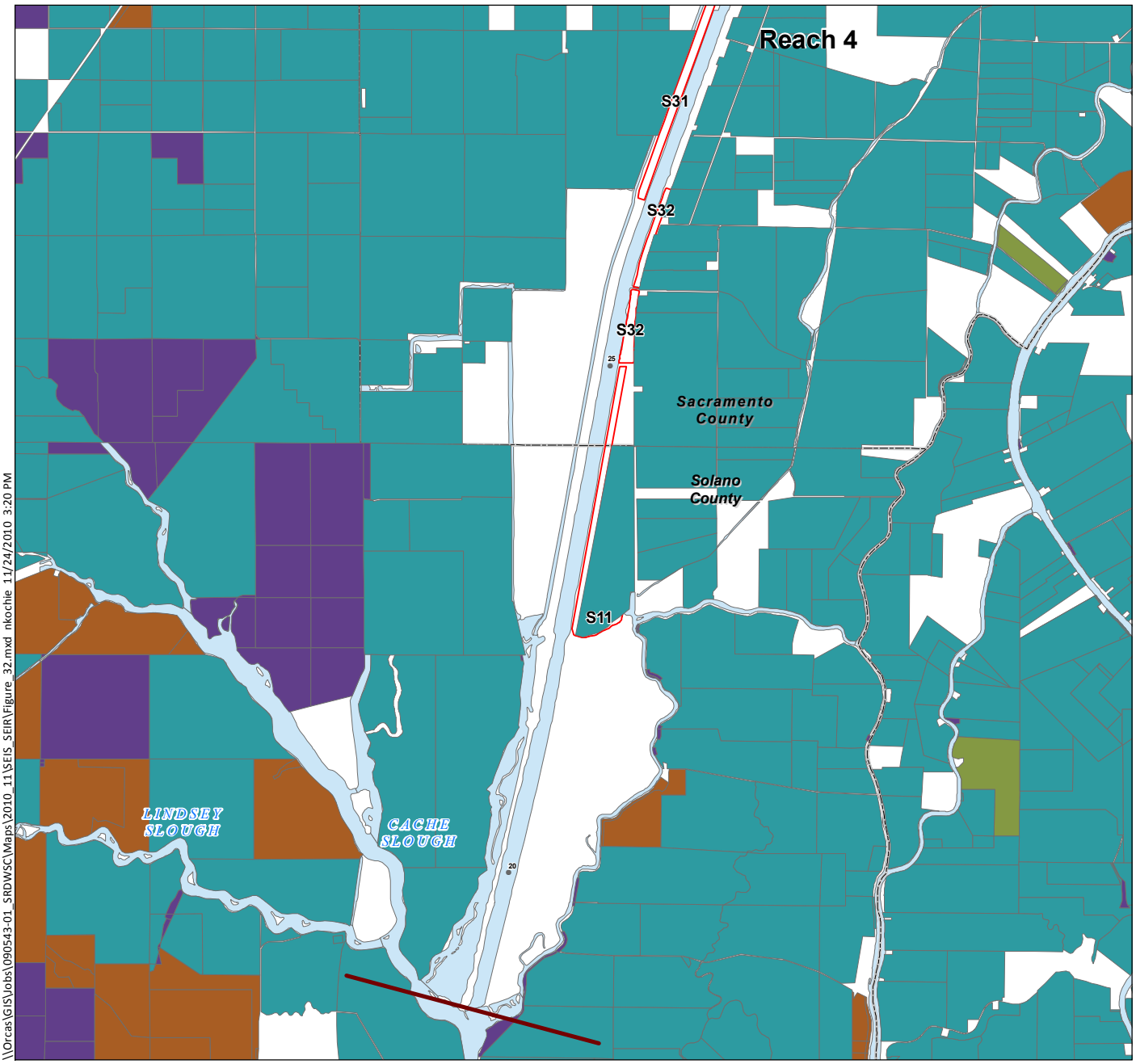


Figure 32d
Williamson Act Properties within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

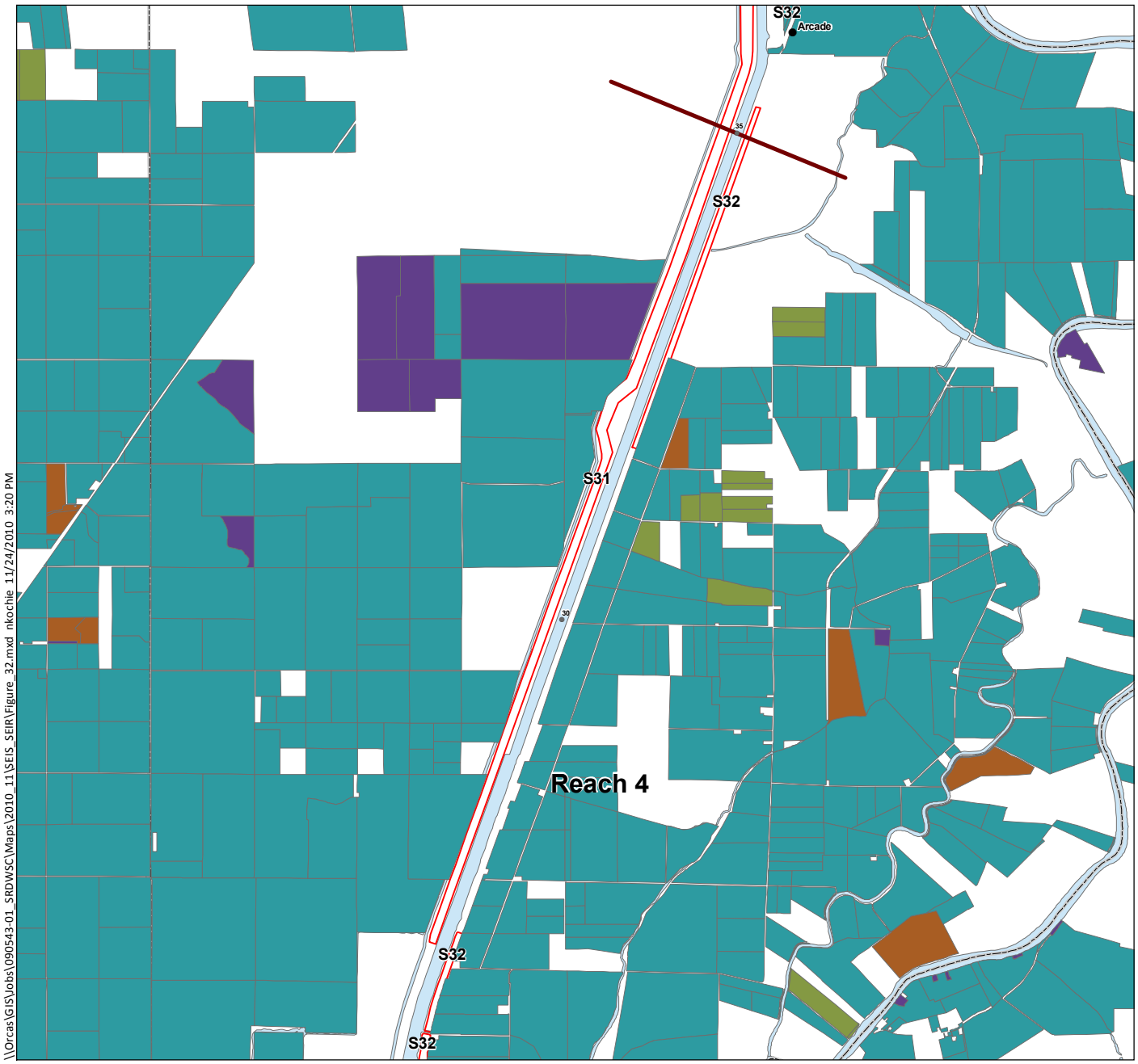


Figure 32e
Williamson Act Properties within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

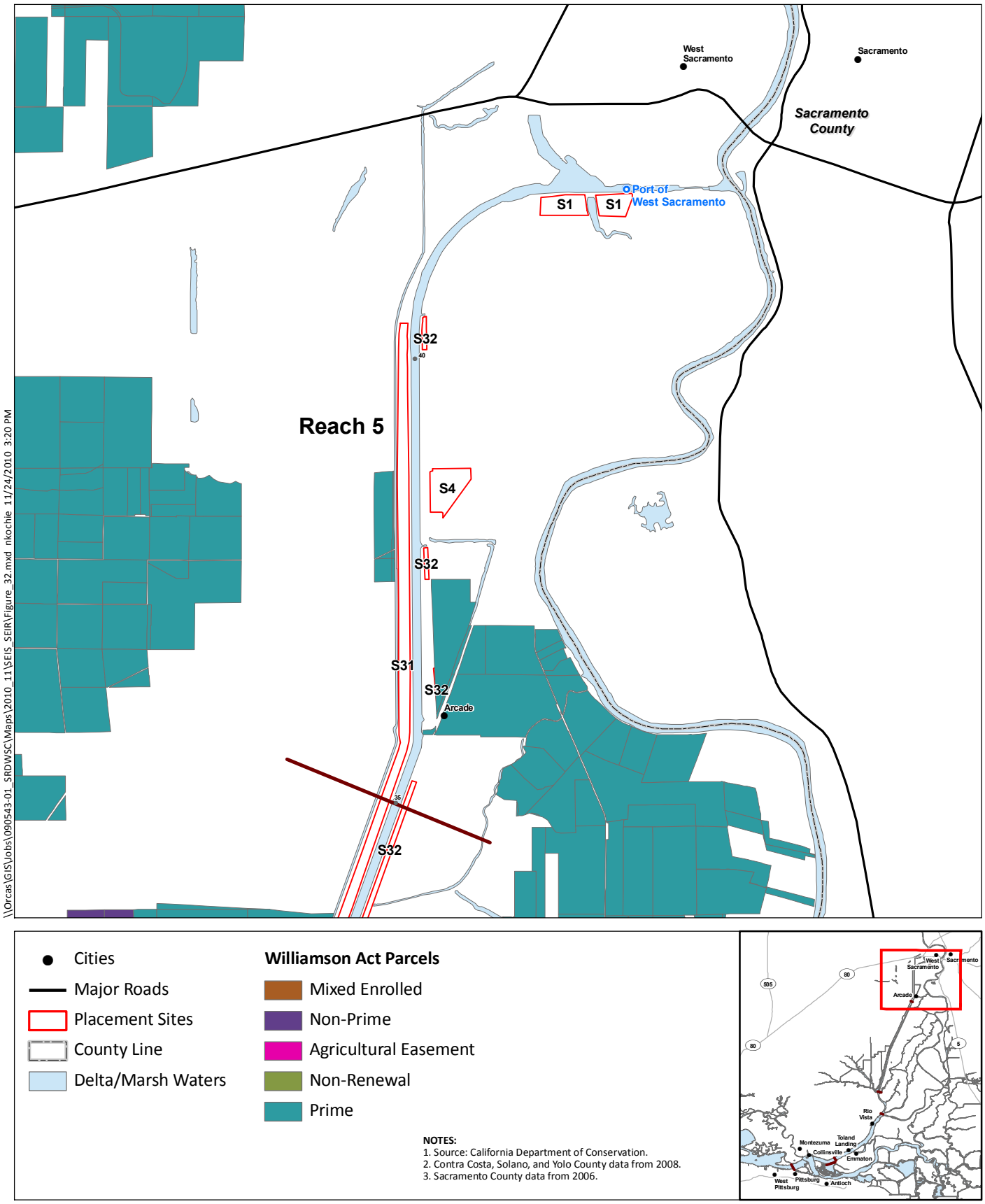


Figure 32f
Williamson Act Properties within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

3.3.1.2 Methodology for Determining Impacts

3.3.1.2.1 Land Use

To ascertain the compatibility of the alternatives with General Plans, the proposed activities were compared to the land uses identified the General Plans. The General Plans guide the process of zoning, and zoning must comply with the General Plans. The majority of the land use designations shown in Figure 31 were derived from applicable General Plans; however, where digital data were available, zoning designations were provided.

3.3.1.2.2 Population

The estimated number of temporary construction workers for each alternative was compared to the forecasted population and capacity of the affected counties and municipalities. To account for the highest possible demand, it is assumed that each temporary or permanent worker would reside with their family. The average household size in the United States is 3.14 (U.S. Census Bureau 2000n). If the projected carrying capacity of the community could be absorbed within a municipality or county, the population changes were considered in compliance with the General Plans.

3.3.1.2.3 Housing

The estimated number of new housing units for temporary and permanent new employees that would reside in the area as a result of the alternatives was compared to the available and projected housing supply for each of the affected counties and municipalities. If the required housing would not exceed current vacancies or projected units of housing, then the alternative was considered to be in compliance with the General Plans.

3.3.1.2.4 Farmland

To demonstrate compliance with the FPPA, federal agencies are expected to evaluate whether or not the alternatives would affect farmland (Farmland Information Center 2006). These analyses are typically developed using a Farmland Conversion Impact Rating Form, which is based on a Land Evaluation and Site Assessment (LESA) system (Farmland Information Center 2006). If the combined score of the form exceeds 160, the impact is typically considered significant by the NRCS (Farmland Information Center 2006).

To assess potential impacts to prime or unique farmland, farmland of statewide or local importance, and grazing land, maps obtained from the FMMP were compared to the geographic extent of activities for the alternatives. For any alternative with potential impacts, the Farmland Conversion Impact Rating Form will be prepared and submitted to the NRCS for consultation prior to the Final SEIS/SEIR.

Other evaluated factors include compliance with existing Williamson Act contracts,

agricultural zoning, or other environmental factors that might cause conversion of farmland to non-farmland. In Solano County, an Orderly Growth Initiative to ensure protection of agricultural and open-space resources includes additional restrictions on re-designation and on residential or mixed-use development outside of municipal areas.

3.3.1.3 Threshold of Significance

An alternative could have an impact on land use (abbreviated as LU in the threshold and mitigation measures in this section) if it would cause the following:

- **LU-1:** Irretrievably convert prime or unique farmland, farmland of statewide or local importance, grazing lands or Williamson Act contracted land to a non-agricultural use, or exceed loss of prime farmland limit for NRCS

Three other thresholds were considered, but were not analyzed in this Draft SEIS/SEIR related to non-compliance with applicable zoning, population, and housing criteria of General Plans. These are detailed below.

Non-Compliance with Applicable Zoning Criteria of General Plans

Table 48 summarizes the current land uses (or zoning for Solano County) on and within approximately 0.5 miles of the proposed dredged material placement sites.

Table 48
Proposed Dredged Material Placement Site Land Use Information

Placement Site	Land Uses on the Site	Surrounding Land Uses
S1	Industrial[a]	Bounded on the north by the SRDWSC with industrial and park lands, business park, and residential to the east as well as waterfront mixed use, bounded by additional industrial, residential, park, and business park on the south and industrial on the west
S4	Agricultural – General[a]	Surrounded by similar land uses
S11	Agriculture[b], Agricultural[c]	Surrounded by agriculture on the northern portions of the site and agricultural on the southern portions of the site with the Sacramento River bounding the western extent of the site
S14	Natural Preservation/ Recreation[d]	Bounded by the Sacramento River on the west, a tributary of the Sacramento River and agricultural land uses to the north, Agricultural Cropland/Resource Conservation Area (AGCROP/RCA) and recreation to the east, and a tributary to the Sacramento River and AG CROP and recreation to the south
S16	Agricultural, Park/Open Space[c]	Agricultural to the west; agricultural and park and open space to the north; and bounded on the northeast, east, and southeast by the Sacramento River
S19	Agricultural[c]	Agriculture on the southwestern, southern, and eastern boundaries with the Sacramento River on the north and agricultural lands farther north

Placement Site	Land Uses on the Site	Surrounding Land Uses
S20	AGCROP/RCA[d]	AGCROP/RCA on the southwestern, southern, and eastern boundaries with the Sacramento River on the north
S31	Agriculture[b] and Agricultural – General[a] (Land use for a portion of this area is undefined by the local general plan)[e]	Bounded on the east by the Sacramento River, agricultural, agriculture, agriculture general, open space, medium and low density residential, light industrial, and agricultural and open space; bounded by general agricultural – general on the north; agricultural and open space on the west; and agricultural on the south
S32	Agriculture[b], Open Space[a]	Bounded on the west by the Sacramento River and agriculture; agriculture, agricultural-general, light industrial and neighborhood commercial/open space, undefined, medium density residential, low density residential, open space, recreation and parks, rural estate, and water-related industrial on the east; heavy industrial on the north; and agriculture to the south
S35	Agricultural[c]	Water dependent industrial is located on the western and northwestern boundaries; agricultural on the northeastern, eastern, and southern boundaries

Sources: City of West Sacramento Services 2010; Solano County Department of GIS 2010; Sacramento County GIS 2010; Yolo County 2010b

Notes:

a City of West Sacramento land use designation
b Yolo County land use designation
c Solano County land use designation
d Sacramento County land use designation

For all alternatives, it is assumed that the appropriate local zoning approvals would be obtained. As such, compliance with the applicable General Plans' zoning criteria is expected for all of the alternatives.

Non-Compliance with Applicable Population Criteria of General Plans

Approximately 6 to 12 temporary workers would be required for maintenance dredging operations under Future without Project Conditions (Scheeler 2010b) and 18 to 20 temporary workers would be required for construction of the Proposed Project or -33 Feet MLLW Alternative (Boedtker 2010). To account for the highest possible demand, it is assumed that each temporary worker would reside with their family. The average household size in the United States is 3.14 (U.S. Census Bureau 2000n). Assuming that 12 workers and their families would temporarily reside in the study area during maintenance dredging activities occurring for approximately 1.5 months annually under Future without Project Conditions, the total number of individuals who might temporarily reside in the study area would be 37. Similarly, assuming that 20 workers were required for construction of the Proposed Project and -33 Feet MLLW Alternative for 6 months per year over an approximately 4 year or 2 to 3 year period, respectively, the total number of individuals who might temporarily reside in

the study area would be 63. The forecasted growth at the Port anticipated to occur under Future without Project Conditions would not involve additional workers (Scheeler 2010c; USACE 2010a).

Many of the communities within the study area have actively planned for increases in population. The City of West Sacramento anticipates their population growth to be 6,400 individuals between 2010 and 2015 (City of West Sacramento 2000). The ABAG has projected a population of 22,100 for Rio Vista in the year 2020 compared to its population of 8,701 in 2008 (City of Rio Vista 2002; State of California Demographic Research 2008). Within Yolo County, a draft General Plan is under development to address population growth through 2020 (Yolo County 2009). Sacramento County is planning to encourage 94,000 new housing units to meet projected population growth (Sacramento County 2007). Between 2000 and 2030, Solano County expects the population within its unincorporated areas to increase from 19,222 to 39,109 (Solano County 2008a). Regional plans suggest the population in unincorporated areas of Contra Costa County would increase from 151,690 in 2000 to 177,000 by 2005 and 185,900 by 2010 (Contra Costa County 2005). Given the negligible increase in temporary workers and their families who would reside in the study area, no impacts to population under any of the alternatives are expected.

Non-Compliance with Applicable Housing Criteria of General Plans

In 2002, Rio Vista indicated a 4.7% vacancy rate, or 93 available units, and is implementing programs to increase units to meet the future projected demand for housing (City of Rio Vista 2002). The City of West Sacramento identified a future deficit in housing stock and is implementing programs to address this potential shortage (City of West Sacramento 2000). Within Yolo County, the vacancy rate was 6%, or 2,135 units, in 2002 (Yolo County 2009). Between 2000 and 2006, the vacancy rates in rose from 5.7 to 5.9%, or approximately 430 vacant units (Yolo County 2009). Within Sacramento County, the demand was projected to exceed available units by 94,000 housing units between 1990 and 2010, and programs were developed to increase the number of housing units (Sacramento County 2007). Solano County also projected future demand exceeding available supply and has begun implementation of programs to improve housing supply (Solano County 2008a). Contra Costa County is increasing its housing stock to address the additional 34,710 units required between 1996 and 2006; however, provision of affordable housing continues to be a concern for the County (Contra Costa County 2005). Given the negligible increase in temporary workers residing in the study area for all of the alternatives, the alternatives are expected to comply with the applicable General Plans' housing criteria.

3.3.1.4 Impacts and Mitigation Measures

LU-1: Irretrievably convert prime or unique farmland, farmland of statewide or local importance, grazing land, or Williamson Act contracted land to a non-agricultural use, or exceed loss of prime farmland limit for NRCS

Future without Project Conditions (NEPA and CEQA Baseline)

Under Future without Project Conditions, no new berms would be constructed at placement sites and use of S1, S14, S16, S19, S20, and S31 would continue. As is shown in Table 47, prime farmland, farmland of statewide importance, and unique farmland would not be impacted under Future without Project Conditions; however, a portion of S19 is under Williamson Act contract. If placement of dredged material on that portion of S19 would be inconsistent with the Williamson Act contract, it is assumed that USACE and the Port would work with the landowner to ensure compliance with the contract. Thus, there would be no impacts to existing zoning for agricultural uses or Williamson Act contract properties under Future without Project Conditions.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

Under the Proposed Project, preparation of the ten proposed dredged material placement sites would involve the construction or raising of levees and modifications to existing land uses. As is shown in Table 47, the Proposed Project would not impact prime farmland; however, it could result in impacts to designated unique farmland, farmland of statewide importance, grazing land, farmland of local importance, and Williamson Act contracted land. Whether or not the Proposed Project would result in the irretrievable conversion of any of these farmland designations would depend on the long-term management of each site, and whether the sites will be made available for agricultural use in the near future.

Thus, as compared to the environmental baseline, there could be potentially significant incremental impacts to unique farmland, farmland of statewide importance, grazing land, farmland of local importance, and Williamson Act contracted land. The mitigation measures below would be implemented to further reduce land use impacts (refer to Table 20 for complete descriptions of mitigation measures).

Mitigation Measures:

- LU-MM-1: Avoid and minimize irretrievable conversions of designated farmlands
- LU-MM-2: Payment of in-lieu fees for mitigation of converted designated farmlands
- LU-MM-3: Provide buffers between incompatible land uses
- LU-MM-4: Develop and implement a 20-year Plan for placement site maintenance
- LU-MM-5: Exercise the cancellation or non-renewal of Williamson Act contracts

Residual Impact after Mitigation: After inclusion of the mitigation measures, the residual impact would be less than significant.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

Under the -33 Feet MLLW Alternative, S1, S14, S16, S19, S20, S31, S35 would be used for dredged material placement. As is shown in Table 47, the -33 Feet MLLW Alternative would not impact prime farmland, unique farmland, or farmland of statewide importance; however, it could result in impacts to designated grazing land, farmland of local importance, and Williamson Act contracted land. As with the Proposed Project, whether or not this alternative would result in the irretrievable conversion of any of these farmland designations depends on the long-term management of each site, and whether the sites will be made available for agricultural use in the near future.

Thus, as compared to the environmental baseline, there could be potentially significant incremental impacts to grazing land, farmland of local importance, and Williamson Act contracted land. The mitigation measures below would be implemented to further reduce land use impacts (refer to Table 20 for complete descriptions of mitigation measures).

Mitigation Measures:

- LU-MM-1: Avoid and minimize irretrievable conversions of designated farmlands
- LU-MM-2: Payment of in-lieu fees for mitigation of converted designated farmlands
- LU-MM-3: Provide buffers between incompatible land uses
- LU-MM-4: Develop and implement a 20-year Plan for placement site maintenance
- LU-MM-5: Exercise the cancellation or non-renewal of Williamson Act contracts

Residual Impact after Mitigation: After inclusion of the mitigation measures, the residual impact would be less than significant.

3.3.1.4.1 Summary of Impacts and Mitigation Measures

Table 49 summarizes impact determinations, mitigation measures, and residual impacts after mitigation, if applicable, for each alternative with respect to the land use impacts described above.

Table 49
Summary of Land Use Impacts and Mitigation Measures

Alternative	Impact	Mitigation	Residual Impact After Mitigation
LU-1: Irretrievably convert prime or unique farmland, farmland of statewide or local importance, grazing land, or Williamson Act contracted land to a non-agricultural use, or exceed loss of prime farmland limit for NRCS			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	Potentially significant impact	LU-MM-1, 2, 3, 4, and 5	Less than significant impact
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	Potentially significant impact	LU-MM-1, 2, 3, 4, and 5	Less than significant impact

3.3.2 Aesthetics

This section provides baseline conditions and assesses potential impacts to aesthetics from the Proposed Project and alternatives.

3.3.2.1 Baseline Conditions

Aesthetic resources are generally defined as the natural and built features of the landscape that can be seen by the public and that contribute to their appreciation of the environment. This section describes the existing aesthetic conditions in the study area, starting from the westernmost extent of the study area (Reach 1) and moving northeast to the Port (Reach 5) and evaluates the potential for the various alternatives to affect viewsheds or to generate new light and glare impacts. Figure 33 shows existing viewsheds along the SRDWSC.

Within Reach 1, the SRDWSC is visible from the north from the town of Collinsville, which consists of a handful of docks and mixed residential and commercial development along the shoreline. The remainder of the Reach 1 viewshed on the north bank of the SRDWSC is either rural and undeveloped land, or wind energy farms. The SRDWSC is not visible from developed areas to the south in Reach 1.

The northern shoreline of Reach 2 consists of rural, undeveloped, and agricultural areas. The only developments along the shoreline in this area with views of the SRDWSC are several utility control buildings. Farther north in Reach 2 and along the western bank of the SRDWSC are Sandy Beach State Park, a U.S. Coast Guard (USGS) property, and the city of Rio Vista. A marina; private residences and docks; the Point Waterfront Restaurant; and other municipal, commercial, and industrial buildings have views of the SRDWSC. The California State Highway 12 Rio Vista Bridge crosses the SRDWSC in Reach 2. A large industrial area along River Road and the Riverbank Mobile Home and RV Park are located to the north of the bridge and along the shoreline of the SRDWSC. Route 160, a state designated scenic highway, enters the study area near site S19 and follows the eastern side of the river until it veers to the right along a Sacramento River tributary northeast of Rio Vista (Figure 34) (Mile by Mile 2010). The highway is designated scenic from the Contra Costa County line to the southern city limit of Sacramento (Caltrans 2010). This road's primary scenic value is its viewshed of historic Delta agricultural areas and small towns along the Sacramento River (Caltrans 2010).

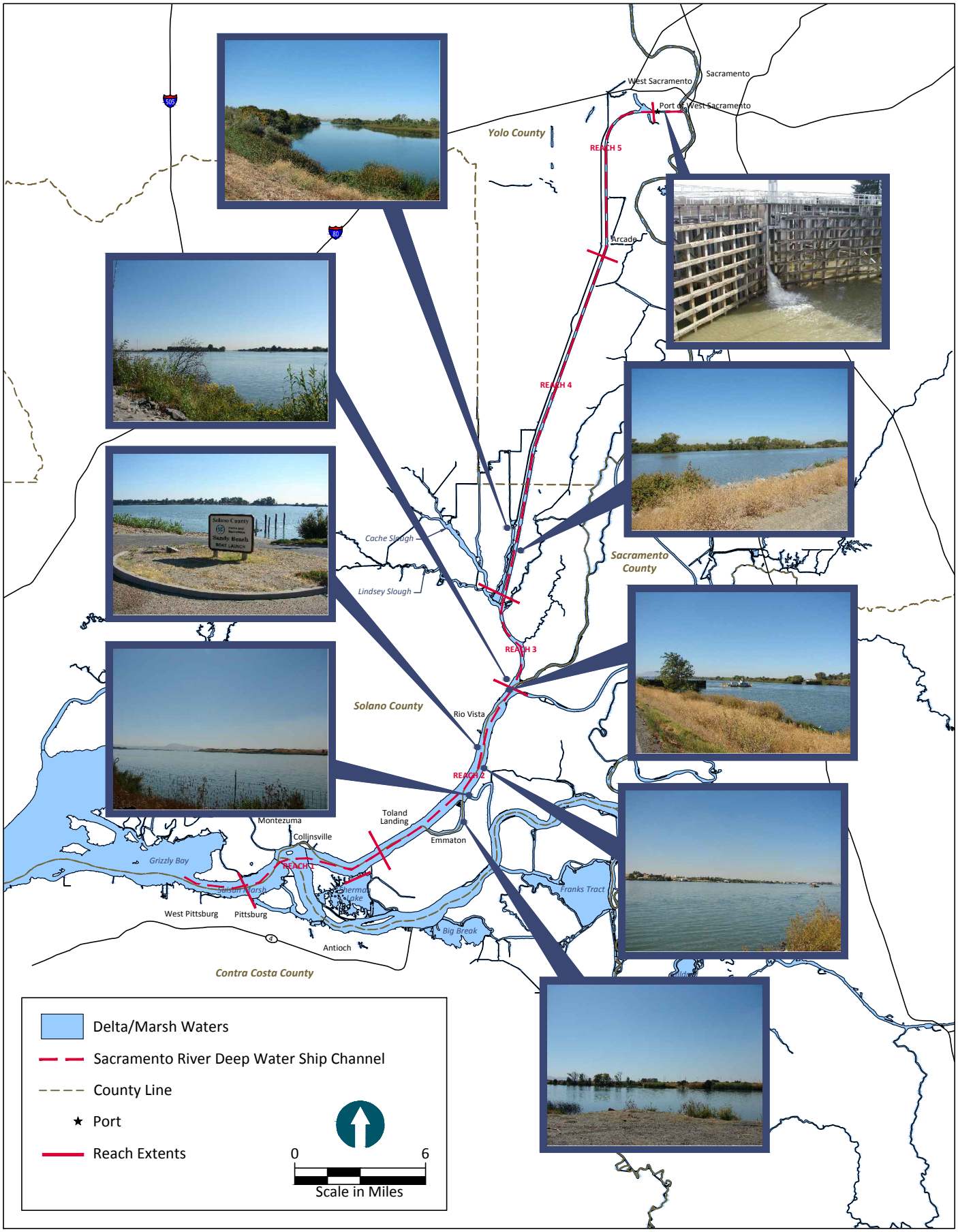
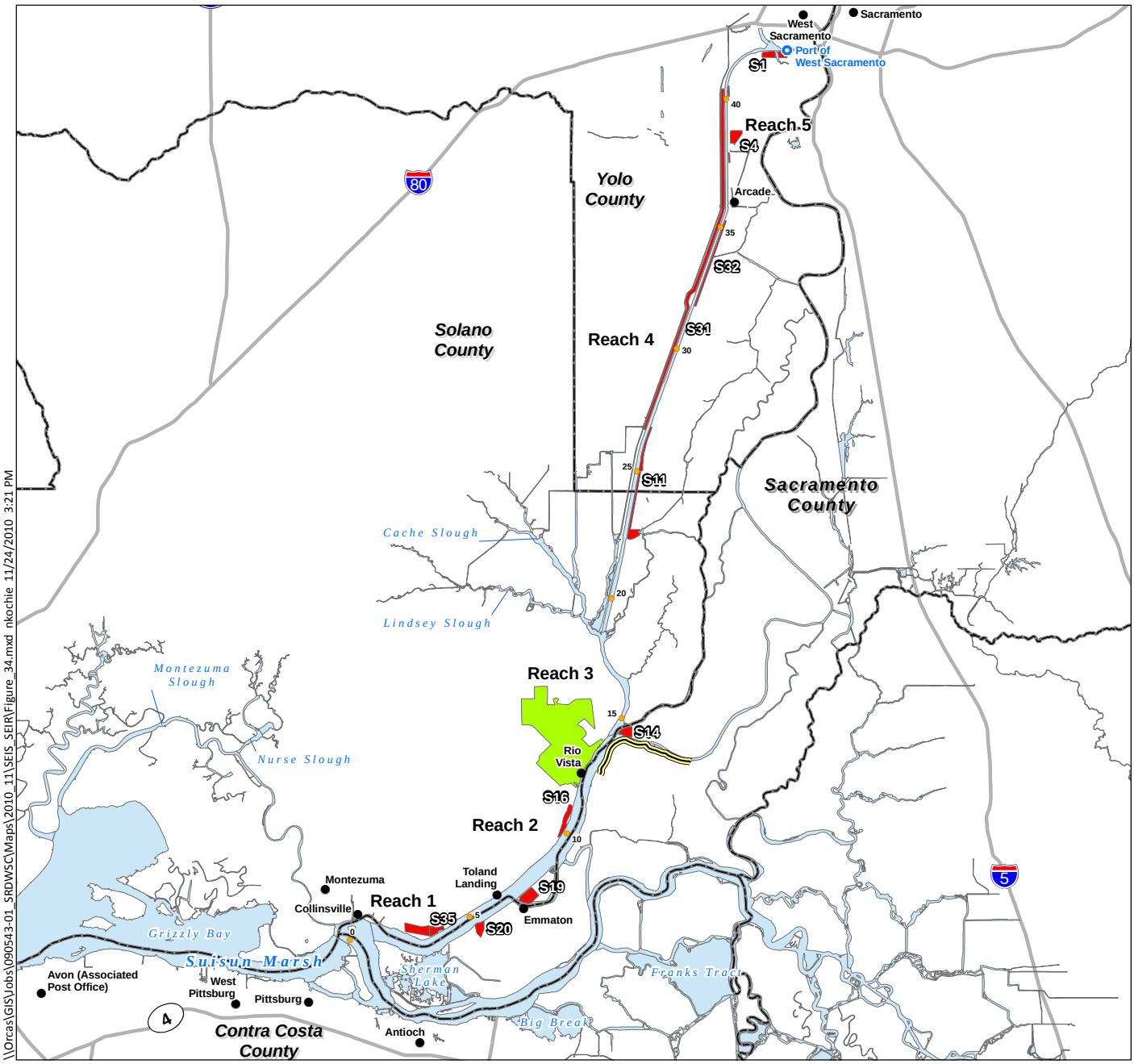


Figure 33
Aesthetic Resources
SEIS/SEIR
Sacramento River Deep Water Ship Channel



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- City
- Port
- River Mile
- Reach Extent
- Major Road
- Placement Sites
- County Line
- Delta/Marsh Waters
- Scenic Section State Route 160 (Within Project Study Area)
- Rio Vista Municipal Boundary

Miles
0 3 6

N

Figure 34
Scenic Route 160 within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

Within the state of California, the scenic highway designation protects the scenic values of an area and official designation requires a local jurisdiction to enact a scenic corridor protection program that protects and enhances scenic resources (Caltrans 2010). Possible enforcement measures may include:

- Protection from "encroachment of inappropriate land uses such as junkyards, dumps, rendering plants and gravel pits"
- Mitigation by proper siting, landscaping, or screening
- Prohibition of billboards and regulation of on-site signs
- Development of compatibility standards including "building siting, height, colors and materials that are harmonious with the surroundings"
- Regulation of grading to prevent erosion and cause minimal alteration of existing contours and vegetative features
- Protection of hillsides by allowing only low-density development on steep slopes and along ridge lines
- Prevention of the need for noise barriers (sound walls) by requiring a minimum setback for residential development adjacent to the highway

Under the *City of Rio Vista General Plan*, the City of Rio Vista strives to protect waterfront property and parks to maintain scenic values (City of Rio Vista 2002). The City of Rio Vista intends to preserve open space for scenic areas through its zoning (City of Rio Vista 2002). Within the municipal limits, Rio Vista limits development along scenic highways to general and service commercial, if zoned before the effective date of the ordinance codified in the title; general manufacturing, if zoned before the effective date of said ordinance; one-family dwellings or mobile homes that meet the definition of a one-family dwelling stated in Section 17.02.040 but not including tents or recreational vehicles; all agricultural uses except the conducting and maintenance of hog farms; golf courses and country clubs; public parks and playgrounds; hiking and riding trails; and accessory buildings and accessory uses incidental to any permitted use (City of Rio Vista 2010a). Other limited uses with additional permit approvals are allowed near the scenic road within the city limits (City of Rio Vista 2010a).

The remaining portions of the road within the study area are located in Sacramento County, and Sacramento County maintains a similar policy. It "intends to promote recreational facilities of all types and to protect and enhance the natural scenic features of the County assuring that pleasing or attractive visual aesthetics are maintained" (Sacramento County 2007). The *County of Sacramento General Plan* limits zoning adjacent to the highway to "largely agricultural (A-10, AG-20, and AG-80) with spots of recreational and commercial recreational zoning (O and CO respectively)" (Sacramento County 2007). Some pockets of residential, commercial, and industrial zoning occur within small communities (Sacramento

County 2007). Sign controls are also applied (Sacramento County 2007).

The southeastern shoreline of Reach 2 includes Sherman, Decker, Brannan, and Grand Islands. The SRDWSC and S20 are visible from residences along West Sherman Island Road and the Rio Viento RV Park. S19 is located on Decker Island, which sits between Sherman Island and Brannan Island. Decker Island is not accessible to the public, and S19 is only partially visible from Sherman Island. Northeast of Decker Island is Brannan Island, home to Brannan Island State Recreation Area, which overlooks the SRDWSC. The SRDWSC can also be seen from the Victory Highway (Highway 160), which spans Brannan Island, the Brannan Island RV Park, and the Cliff House Fishing Access Area just northeast of the Rio Vista Bridge. Grand Island is located to the north of Brannan Island but is inaccessible to the public. S14 is located at the western tip of Grand Island and is partially visible from across the water to the north, west, and south.

The Rio Vista/Ryer Island Ferry crosses the SRDWSC from Liberty Island, just north of Rio Vista in Reach 3. The ferry operates all day long on every day of the year and offers viewpoints of the SRDWSC. The remainder of Reach 3 to the north of the ferry is agricultural or rural, undeveloped land. The east bank of Reach 3 is bordered by State Highway 84, agricultural areas, and a few private residences. The SRDWSC is not typically visible from these areas due to the levee that spans the east bank of the channel.

Along both banks of the SRDWSC in portions of Reach 3 and throughout Reaches 4 and 5 are levees and vegetation that block views of the channel from adjacent areas. The SRDWSC is partially visible in the vicinity of the community of Arcade in Reach 4 and from industrial complexes alongside the SRDWSC in the vicinity of the Port in Reach 5. Farther east, the Port, its turning basin, and the Lake Washington Boulevard Bridge overlook the SRDWSC.

3.3.2.2 Methodology for Determining Impacts

Impacts to aesthetic resources were qualitatively evaluated based on the potential for the various alternatives to temporarily or permanently alter or result in the loss of aesthetic resources in the study area. Losses of aesthetic resources would include substantial adverse effects to scenic vistas; substantial damage to scenic resources including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway; substantial degradation of the existing visual character or quality of life of the site or its surroundings; or creation of a new source of substantial light or glare that would adversely affect day or nighttime views in the study area (California AEP 2009). The degree of impact depends both on the magnitude of change in the visual resource (i.e., visual character and quality) and on viewers' responses to and concern for those changes.

Glare is a very harsh, bright, dazzling light that may affect aesthetics as well as impair vision. Within Rio Vista, performance standards are used for specific types of zoning to address glare, dust, and other factors (City of Rio Vista 2002, 2010b). Sacramento County requires that lighting be engineered "so as not to produce direct glare or 'stray light' on adjacent properties. When located adjacent to any property zoned AR-1, RD-1, RD-2, RD-3, RD-4, RD-5, RD-7, RD-10, RM-1, A-1-A, A-1-B, or any interim estate zone, perimeter lighting shall be designed such that the source of the lighting is not visible from adjoining properties" (Sacramento County 2010c). Sacramento County also limits reflective surfaces to prevent glare (Sacramento County 2007). Solano County requires a buffer to protect residential areas from glare (Solano County 2008a). The City of West Sacramento and Yolo County further limit the use of construction equipment to reduce glare (City of West Sacramento 1990; Yolo County 2009).

Acceptable light levels are often defined by local regulatory requirements; however, specific requirements were not defined in the general plans or zoning ordinances available for the individual cities and counties within the study area. To establish a working definition for the impact analyses, the Bloomington, Minnesota, standard for brightness was adopted. Light sources must not exceed a maximum illumination of 5,000 nits, illumination of 5,000 nits (candelas per square meter) during daylight hours, and a maximum illumination of 500 nits between dusk and dawn (American Planning Association 2008). One candela is a unit of luminous intensity that correlates with the amount of light that would illuminate a surface 1 foot from a light source (Davidson and Dolnick 1999). For the purposes of this Draft SEIS/SEIR, it is assumed that the lighting conditions at the Port would remain unchanged even with forecasted market growth.

Failure to meet performance standards or large amounts of light pollution visible from the State 160 corridor would represent a substantial and adverse effect on the scenic highway.

3.3.2.3 Thresholds of Significance

An alternative could have an impact on aesthetic (abbreviated as A in the thresholds in this section) resources if it would cause the following:

- A-1: Substantially and negatively affect the existing views for residents in the study area
- A-2: Create a new source of substantial light or glare that would adversely affect day or nighttime views
- A-3: Substantially and adversely affect the scenic vistas of Route 160, a state scenic highway

3.3.2.4 Impacts and Mitigation Measures

A-1: Substantially and negatively affect the existing views for residents in the study area

Future without Project Conditions (NEPA and CEQA Baseline)

Under Future without Project Conditions, ongoing use of the SRDWSC by general and bulk carriers and liquid tankers accessing the Port and routine maintenance dredging and dredged material placement operations would continue to result in changes to existing views for residents in the study area as well as motorists on Route 160. No new lights at the Port are anticipated (Scheeler 2010c). The growth estimated to occur at the Port would result in an increase from approximately 58 vessels in 2011 to approximately 143 vessels in 2053 (Ilanco Environmental 2010b). Vessel sizes would be consistent with those of vessels currently calling on the Port.

The primary areas with viewsheds of the SRDWSC include parks, residences, and businesses along Sherman Island's northern shoreline, Brannan Island's western shoreline, waterfront areas in Rio Vista and Sandy Beach State Park, the Rio Vista Bridge, the Ryer Island Ferry, and the community of Arcade. The SRDWSC could also be viewed from portions of Route 160. Viewsheds of the SRDWSC would see an increase in the number of general and bulk carriers and liquid tankers traversing the SRDWSC. Other vessels would continue to traverse the SRDWSC at current frequencies, including privately owned sail and motor boats, the Rio Vista/Ryer Island Ferry, USGS vessels, and a dinner cruise ship based in Sacramento. In addition, the tug that begins servicing the Port in 2011 as part of its new container barge service would also be visible from areas with viewsheds of the SRDWSC approximately once per week. Port operations may also be modified as well.

Annual maintenance dredging and dredged material placement activities would be visible from specific points along the SRDWSC for approximately 1.5 months annually. The navigation lights would be low-emitting industrial lights and used during nighttime conditions. Maintenance dredging would be visible from all of the same viewsheds from which vessels traversing the SRDWSC are visible; however, fewer sites along the SRDWSC would have views of the placement sites themselves. No parks, residences, or businesses have unobstructed views of S1, S16, S19, or S31. S14 is partially visible from across the SRDWSC on River Road north of Rio Vista; therefore, residents of the Riverbank Mobile Home and RV Park and workers at River Road businesses could have views of dredged material placement at S14. It is also partially visible from across the main-stem of the Sacramento River along portions of Victory Highway on Brannan Island and from the Hidden Harbor sailboat marina located north of the site; therefore, drivers along Victory

Highway and marina users could also have views of dredged material placement at S14. S20 is visible from Rio Viento RV Park on Sherman Island; therefore, park visitors could have views of both dredging and dredged material placement activities at S20. These efforts would not affect their view of the SRDWSC (Doak 2010).

The above mentioned effects would be similar in intensity to ongoing maintenance dredging practices, and while operational shipping would increase, impacts would be of the same nature as existing conditions. Thus, there would be no impacts to existing viewsheds under Future without Project Conditions.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

Under the Proposed Project, the number of vessels estimated to traverse the widened and deepened channel would decrease as more fully loaded vessels are able to access the Port; instead of approximately 143 vessels on the channel in 2053, there would only be approximately 100. This expected shift in vessel usage is described in Section 2.2.2. This represents a benefit of the Proposed Project compared to Future without Project Conditions in terms of reducing the number of ships on the SRDWSC. Specifically, these vessels would be visible from areas with viewsheds of the SRDWSC, including the parks, residences, and businesses along Sherman Island's northern shoreline, Brannan Island's western shoreline, waterfront areas in Rio Vista and Sandy Beach State Park, the Rio Vista Bridge and Route 160, the Ryer Island Ferry, and the community of Arcade. No new industrial lighting at the Port is anticipated.

Construction dredging operations occurring under the Proposed Project throughout the SRDWSC would also be intermittently visible from these viewpoints for 6 months per year over an approximately 4-year timeframe. After construction is completed, future maintenance dredging operations would continue to be visible from these viewpoints for approximately 1.5 months per year.

Dredged material placement activities would be visible from several locations throughout the study area. Residences, businesses, or public roads would have limited views of dredged material placement occurring at S1, S4, S11, S16, S31, or S35. S14 is partially visible from across the SRDWSC on River Road north of Rio Vista; therefore, residents of the Riverbank Mobile Home and RV Park and workers at River Road businesses could have views of dredged material placement at S14. It is also partially visible from across the main-stem of the Sacramento River along portions of Victory Highway on Brannan Island and from the Hidden Harbor sailboat marina located north of the site; therefore, drivers along Victory

Highway and marina users could also have views of dredged material placement at S14. S19 is partially visible from West Sherman Island Road; therefore, drivers along West Sherman Island Road could have views of dredged material placement at S19. S20 is visible from Rio Viento RV Park on Sherman Island; therefore, park residents could have views of dredged material placement activities at S20. S32 is visible from a portion of Jefferson Boulevard (I-84) near Arcade; therefore, drivers along Jefferson Boulevard could have views of dredged material placement at S32. The USACE is still determining whether raising berms around dredged material placement sites would be necessary under the Proposed Project; however, a maximum height increase of between 6 and 22 feet would be necessary for storage depending on the condition and geotechnical integrity of the property (see Table 9). It is possible that if berms are raised, they could be increasingly visible at S14, S16, S19, and S20.

Any impacts to the existing views for residents of the study area at the locations identified above would be temporary in nature, limited to the 6-month annual construction window for a period of approximately 4 years. Impacts to existing views for residents in the study area under the Proposed Project are expected to be similar to those caused by maintenance dredging activities included under Future without Project Conditions and the CEQA No Project Alternative, but would occur for approximately 4.5 and 5 months longer, respectively, each year for the approximately 4 years of construction. Thus, while the effects of dredging under the Proposed Project would result in temporary impacts to views for existing residents in the study area that are greater than under Future without Project Conditions, the effects would be relatively short-term and would be removed once construction was concluded if the sites are returned to existing conditions. Future maintenance activities associated with the Proposed Project would be similar to Future without Project Conditions but would most likely occur for a longer duration each year. Thus, as compared to the environmental baseline, there would be incrementally increased but less than significant impacts to existing views for residents as a result of the Proposed Project.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: The residual impact would be less than significant.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

Impacts to existing views for residents under the -33 Feet MLLW Alternative would generally be the same as for the Proposed Project. While approximately 29 fewer vessels would traverse the SRDWSC under the -33 Feet MLLW Alternative than under Future without Project Conditions, the vessels would still be visible from areas with viewsheds of the SRDWSC, including the parks, residences, and businesses along Sherman Island's northern shoreline, Brannan Island's western shoreline, waterfront areas in Rio Vista and Sandy Beach State Park, the Rio Vista Bridge, the Ryer Island Ferry, and the community of

Arcade. No new industrial lighting at the Port is anticipated.

Construction dredging operations occurring under the -33 Feet MLLW Alternative would also be intermittently visible from these viewpoints for 6 months per year over an approximately 2- to 3-year timeframe. After construction is completed, future maintenance dredging operations would continue to be visible from these viewpoints for approximately 1.5 month per year.

Dredged material placement activities would be visible from the same areas as in the Proposed Project, with the exception of placement sites S4, S11, and S32. It is assumed that the berms would not be of sufficient height to affect the viewshed significantly. Thus, as compared to the environmental baseline, there would be incrementally increased but less than significant impacts to existing views for residents as a result of the -33 Feet MLLW Alternative.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: The residual impact would be less than significant.

A-2: Create a new source of substantial light or glare that would adversely affect day or nighttime views

Future without Project Conditions (NEPA and CEQA Baseline)

Under Future without Project Conditions, the forecasted increase in shipping operations would not create new sources of light or glare on the SRDWSC. Residential and commercial areas with viewpoints of the SRDWSC would see an increase in the number of vessels on the SRDWSC; however, the movement of ships through or across any one point of view would be a transient, temporary effect. No new lights at the Port are anticipated.

Ongoing maintenance dredging does not generate sources of light or glare during daylight conditions; however, the transfer pipe and other dredging equipment necessary to support the transport of dredged material to dredged material placement sites may create reflection on sunny days. Any reflection would be temporary and sporadic, seen only from certain angles by boaters or other recreationalists passing adjacent to the operations, or by residents driving alongside or across the SRDWSC. There may also be some nighttime lighting on navigational aids, which is necessary for marine safety and to light work areas. These are expected to consist of low-intensity, industrial lighting, which would focus upon the work areas.

The above mentioned effects would be similar in intensity to ongoing maintenance dredging practices, and while operational shipping would increase, impacts would be of the same

nature as existing conditions. Thus, there would be no impacts from light or glare under Future without Project Conditions.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

Under the Proposed Project, the number of vessels forecasted to traverse the widened and deepened channel should decrease as more fully loaded vessels are able to access the Port. Therefore, shipping operations would not cause any increase in sources of light or glare on the SRDWSC during daytime or nighttime conditions. Residential and commercial areas with viewpoints of the SRDWSC would see a decrease in the number of vessels compared to Future without Project Conditions.

Any additional sources of light or glare generated by dredging or dredged material placement occurring as part of the Proposed Project would be temporary in nature, limited to the 6-month annual construction window for a period of approximately 4 years, and to vessel traffic along the SRDWSC. Any additional sources of light or glare are expected to be similar to those caused by maintenance dredging activities that would occur under Future without Project Conditions and the CEQA No Project Alternative, but would occur for approximately 4.5 and 5 months longer, respectively, each year for the approximately 4 years of construction. Future maintenance activities associated with the Proposed Project would likely occur for a longer duration each year than under Future without Project Conditions.

While dredging activities would not generate sources of light or glare, the transfer pipe and other dredging equipment necessary to support transporting dredged material to dredged material placement sites may create reflection on sunny days. Any reflection would be temporary and sporadic, seen only from certain angles by boaters or other recreationalists passing adjacent to the operations, or by residents driving alongside or across the SRDWSC. The Proposed Project may also involve the installation of nighttime lighting or navigational aids, which are necessary for marine safety and to light the work areas; however, these new sources of lighting would be low in intensity and transient in any individual location. Thus, as compared to the environmental baseline, there would be incrementally increased but less than significant impacts to light and glare as a result of the Proposed Project.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: The residual impact would be less than significant.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

Under the -33 Feet MLLW Alternative, impacts from additional temporary and sporadic sources of light or glare would be consistent with those of the Proposed Project. Any

additional sources of light or glare would be temporary in nature, limited to the 6-month annual construction window for a period of approximately 2 to 3 years, and to vessel traffic along the SRDWSC. Thus, as compared to the environmental baseline, there would be incrementally increased but less than significant impacts to light and glare as a result of the -33 Feet MLLW Alternative.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: The residual impact would be less than significant.

A-3: Substantially and adversely affect the scenic vistas of Route 160, a state scenic highway

Future without Project Conditions (NEPA and CEQA Baseline)

Commercial shipping traffic, maintenance dredging in the SRDWSC, and dredged material placement would be partially visible to traffic on Route 160. It is assumed that visual impacts would be largely temporary in nature and would not result in nighttime glare or permanent changes in the viewshed. The continuing movement of ships through or across any one point of view would be a transient, temporary, or negligible effect. Thus, there would be no impacts to the scenic vistas of Route 160 under Future without Project Conditions.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

Commercial shipping traffic, construction and maintenance dredging in the SRDWSC, and dredged material placement would be partially visible to traffic on Route 160. As with Future without Project Conditions, it is assumed that visual impacts would be largely temporary in nature and would not result in nighttime glare or permanent changes in the viewshed. The continuing movement of ships through or across any one point of view would be a transient, temporary effect. Thus, as compared to the environmental baseline, there would be no impact to the scenic vistas of Route 160 as a result of the Proposed Project.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

Impacts to the scenic vistas of Route 160 from the -33 Feet MLLW Alternative would be consistent with those of the Proposed Project. Thus, as compared to the environmental baseline, there would be no impact to the scenic vistas of Route 160 as a result of the -33 Feet MLLW Alternative.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

3.3.2.4.1 Summary of Impacts and Mitigation Measures

Table 50 summarizes impact determinations, mitigation measures, and residual impacts after mitigation, if applicable, for each alternative with respect to the aesthetic resources impacts described above.

Table 50
Summary of Aesthetic Resources Impacts and Mitigation Measures

Alternative	Impact	Mitigation	Residual Impact After Mitigation
A-1: Substantially and negatively affect the existing views for residents in the study area			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	Less than significant impact	None	Less than significant impact
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	Less than significant impact	None	Less than significant impact
A-2: Create a new source of substantial light or glare that would adversely affect day or nighttime views			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	Less than significant impact	None	Less than significant impact
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	Less than significant impact	None	Less than significant impact
A-3: Substantially and adversely affect the scenic vistas of Route 160, a state scenic highway			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	No impact	None	None
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	No impact	None	None

3.3.3 Air Quality

This section provides baseline air quality information and assesses potential impacts to air quality from the Proposed Project and alternatives.

3.3.3.1 Baseline Conditions

The SRDWSC study area is located primarily within the Sacramento Valley Air Basin (SVAB), which is bounded by the North Coast Ranges on the west and Northern Sierra Nevada Mountains on the east. The intervening terrain is relatively flat. The SVAB includes all of Sacramento and Yolo counties and portions of Placer, El Dorado, Solano, and Sutter counties. The overwhelming majority of the potential air quality impacts associated with the Proposed Project and alternatives would be within the jurisdiction of the Yolo Solano Air

Quality Management District (YSAQMD), which includes all of Yolo County and parts of Solano County. However, some construction activities would also occur within the Sacramento Metropolitan Air Quality Management District (SMAQMD) and the Bay Area Air Quality Management District (BAAQMD). The Clean Air Act (CAA) establishes air quality regulations and delegates enforcement of these standards to the states. In California, the Air Resources Board (ARB) is responsible for enforcing air pollution regulations, and has, in turn, delegated the responsibility of regulating stationary emission sources to the local air agencies. In the SVAB, the local air agency is the YSAQMD.

3.3.3.1.1 Regional Climate and Meteorology

Hot, dry summers and mild, rainy winters characterize the Mediterranean climate of the SVAB. During the year, the temperature may range from 20 to 115 degrees Fahrenheit (°F) with summer highs typically in the 90s and winter lows occasionally below freezing. Average annual rainfall is 20 inches, and the rainy season generally occurs from November through May. The prevailing winds are westerly and moderate in strength.

The mountains surrounding the SVAB create a barrier to airflow, which can trap air pollutants under certain meteorological conditions. This tends to occur mainly in the autumn and early winter when large areas of high-pressure collect over the Sacramento Valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduces the influx of outside air, and allows air pollutants to become concentrated in a stable volume of air. Surface concentrations of pollutants are highest when these conditions are combined with temperature inversions that trap pollutants near the ground.

The "ozone" season occurs in May through October and 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 SVAB; however, between July and September, a phenomenon called the "Schultz Eddy" sometimes prevents this from occurring. Instead of allowing for the prevailing wind patterns to move north and carry the pollutants out, the Schultz Eddy causes the wind pattern to circle back to the south. This phenomenon causes the air pollutants to be blown south toward the YSAQMD (and thus, the study area). This phenomenon has the effect of exacerbating pollution levels and increasing the likelihood of violating federal or state standards. The Schultz Eddy normally dissipates around noon when the Delta sea breeze arrives.

3.3.3.1.2 Criteria Pollutants and Air Monitoring

Criteria Pollutants

Air quality at a given location can be characterized by the concentration of various

pollutants in the air. Units of concentration are generally expressed as parts per million on a volume basis (ppmv) or micrograms per cubic meter (μg/m3) of air. The significance of a pollutant concentration is determined by comparing the concentration to an appropriate national or state ambient air quality standard. These standards represent the allowable atmospheric concentrations at which public health and welfare are protected, and they include a reasonable margin of safety to protect more sensitive individuals.

The U.S. Environmental Protection Agency (USEPA) establishes the national ambient air quality standards (NAAQS). For most pollutants, maximum concentrations may not exceed an NAAQS more than once per year, and they may not exceed the annual standards. The ARB establishes California Ambient Air Quality Standards (CAAQS), which are generally more stringent and include more pollutants than the NAAQS. Maximum pollutant concentrations must be less than the CAAQS.

Pollutants that have corresponding NAAQS or CAAQS are known as criteria pollutants. The criteria pollutants of primary concern in the study area are ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter with particle diameter less than 10 microns (PM_{10}), and particulate matter with particle diameter less than 2.5 microns ($PM_{2.5}$). Criteria pollutants contribute directly to regional health issues. Of the criteria pollutants of concern, O_3 is unique because it is not directly emitted from project-related sources, but rather is a secondary pollutant formed from the precursor pollutants reactive organic gases (ROGs) and nitrogen oxides (NOx). ROGs and NOx react to form O_3 in the presence of sunlight through a complex series of photochemical reactions. The known adverse effects associated with the criteria pollutants are shown in Table 51.

Table 51
Adverse Effects Associated with Criteria Pollutants

Pollutant	Adverse Effects
O_3	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals and (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage
CO	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
NO_2	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration

Pollutant	Adverse Effects
SO_2	(a) Broncho-constriction accompanied by symptoms that may include wheezing, shortness of breath, and chest tightness during exercise or physical activity in persons with asthma
Suspended PM_{10}	(a) Excess deaths from short-term and long-term exposures; (b) excess seasonal declines in pulmonary function, especially in children; (c) asthma exacerbation and possibly induction; (d) adverse birth outcomes including low birth weight; (e) increased infant mortality; (f) increased respiratory symptoms in children such as cough and bronchitis; and (g) increased hospitalization for both cardiovascular and respiratory disease (including asthma)
Suspended $PM_{2.5}$	(a) Excess deaths from short-term and long-term exposures; (b) excess seasonal declines in pulmonary function, especially in children; (c) asthma exacerbation and possibly induction; (d) adverse birth outcomes including low birth weight; (e) increased infant mortality; (f) increased respiratory symptoms in children such as cough and bronchitis; and (g) increased hospitalization for both cardiovascular and respiratory disease (including asthma)

Note:
CAAQS have also been established for lead, sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. They are not shown in this table because they are not pollutants of concern for the Proposed Project and alternatives.

Local Air Monitoring Levels

USEPA designates all areas of the United States according to whether they meet the NAAQS. A nonattainment designation means that a primary NAAQS has been exceeded more than once per year in a given area. USEPA currently designates the Yolo-Solano portions of the SVAB as nonattainment for 8-hour O_3 and as attainment/unclassified for PM_{10}, $PM_{2.5}$, CO, NO_2, and SO_2 (USEPA 2010). USEPA designates the SMAQMD as nonattainment for O_3, PM_{10}, and $PM_{2.5}$; and as attainment/unclassified for CO, NO_2, and SO_2. USEPA designates the BAAQMD as nonattainment for O_3 and $PM_{2.5}$; and as attainment/unclassified for PM_{10}, CO, NO_2, and SO_2. States with nonattainment areas must prepare a State Implementation Plan (SIP) that demonstrates how those areas will come into attainment.

The ARB also designates areas of the state according to whether they meet the CAAQS. A nonattainment designation means that a CAAQS has been exceeded more than once in 3 years. The ARB currently designates the Yolo-Solano portions of the SVAB as nonattainment for O_3, PM_{10}, and $PM_{2.5}$ (Solano County only); and as attainment/unclassified for $PM_{2.5}$ (Yolo County), CO, NO_2, SO_2, sulfates, hydrogen sulfide, lead, and visibility reducing particles (ARB 2010). The ARB also designates the SMAQMD and the BAAQMD as nonattainment for O_3, $PM_{2.5}$, and PM_{10}; and as attainment/unclassified for CO, NO_2, and SO_2.

3.3.3.1.3 Toxic Air Contaminants

Toxic air contaminants (TACs) are identified by the California Office of Environmental Health Hazard Assessment. TACs include air pollutants that can produce adverse human health effects, including carcinogenic effects, after short-term (acute) or long-term (chronic) exposure. The ARB designates diesel particulate matter as a TAC.

3.3.3.1.4 Sensitive Receptors

The impact of air pollutants on sensitive receptor groups, which include children, the elderly, and the acutely and chronically ill, is of special concern. Typical locations for these groups to congregate include residences, schools, daycare centers, convalescent homes, and hospitals. Sensitive receptors in the study area are described in Section 3.1.4.1.3.

3.3.3.1.5 Greenhouse Gas Emissions

Gases that trap heat in the atmosphere are often called greenhouse gases (GHGs). GHGs are emitted by natural processes and human activities. Examples of GHGs that are produced both by natural processes and industry include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Examples of GHGs created and emitted primarily through human activities include fluorinated gases (hydrofluorocarbons [HFCs] and perfluorocarbons [PFCs]) and sulfur hexafluoride (SF_6).

The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without these natural GHGs, the earth's surface would be about 61°F cooler (AEP 2007). However, emissions from fossil fuel combustion for activities such as electricity production and vehicular transportation have elevated the concentration of GHGs in the atmosphere above natural levels. There appears to be a close relationship between the increased concentration of GHGs in the atmosphere and global temperatures. Scientific evidence indicates a trend of increasing global temperatures near the earth's surface over the past century due to increased human-induced levels of GHGs.

GHGs differ from criteria pollutants in that GHG emissions do not cause direct adverse human health effects. Rather, the direct environmental effect of GHG emissions is the increase in global temperatures, which in turn has numerous indirect effects on the environment and humans. The World Resources Institute's GHG Protocol Initiative identifies six GHGs generated by human activity that are believed to be contributors to global warming (WRI 2007). These same six GHGs are identified in California Assembly Bill (AB) 32 and by the USEPA: CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6.

Different GHGs have varying global warming potential. Global warming potential is the ability of a gas or aerosol to trap heat in the atmosphere. By convention, CO_2 is assigned a global warming potential of 1. By comparison, CH_4 has a global warming potential of 21, which means that it has a global warming effect 21 times greater than CO_2 on an equal-mass basis. N_2O has a global warming potential of 310, which means that it has a global warming effect 310 times greater than CO_2 on an equal-mass basis. To account for their global warming potentials, GHG emissions are often reported as a CO_2 equivalent (CO_2e). The CO_2e is calculated by multiplying the emission of each GHG by its global warming potential, and

adding the results together to produce a single, combined emission rate representing all GHGs.

This Draft SEIS/SEIR includes estimates of GHG emissions generated by the construction and operation of the Proposed Project and -33 Feet MLLW Alternative to comply with CEQA requirements, although no significance is ascribed to these estimates.

3.3.3.1.6 Applicable Regulations

In California, the ARB is responsible for enforcing air pollution regulations, and has, in turn, delegated the responsibility of regulating stationary emission sources to the local air agencies. The Proposed Project crosses three local air agencies: the YSAQMD, the BAAQMD, and the SMAQMD. Below is a summary of key federal, state, and local air quality rules, policies, and agreements that apply to the Proposed Project and the -33 Feet MLLW Alternative. Further detail on regulations is provided in Appendix P.

Federal Regulations

Clean Air Act (42 USC 7401 et seq.), as amended – The CAA of 1955 and as amended in 1970 established the structure of the clean air program as it exists today. Major amendments enacted in 1977 and 1990 made significant changes to the program but continued to build on the program as designed in 1970. The primary objective of the CAA is to establish federal standards for air pollutants from stationary and mobile sources and to work with states to regulate polluting emissions. The CAA is designed to improve air quality in areas of the country that do not meet federal standards and to prevent significant deterioration in areas where air quality exceeds those standards. The Proposed Project and alternatives must establish conformity with the CAA (discussed below).

Emission Standards for Non-Road Diesel Engines – To reduce emissions from off-road diesel equipment, USEPA established a series of increasingly strict emission standards for new off-road diesel engines. Tier 1 through 3 standards were phased in between 1996 and 2008. Tier 4 standards, which require add-on emission control equipment to attain them, are being phased in from 2008 to 2015. These standards apply to construction equipment and terminal equipment, based on year of manufacture. Locomotives and marine vessels are exempt.

Emission Standards for Marine Diesel Engines – To reduce marine diesel engine emissions, USEPA established emission standards for new engines. Tier 2 standards were phased in between 2004 to 2007. Tier 3 standards are being phased in between 2009 and 2014. The after-treatment-based Tier 4 standards will be phased in from 2014 to 2017. These standards apply to harbor craft, depending on year of engine manufacture.

Emission Standards for On-Road Trucks – To reduce emissions from on-road, heavy-duty diesel trucks, USEPA established a series of increasingly strict emission standards for new engines, starting in 1988. Complete phase-in of the Tier 2 standards for new engines will be accomplished in 2010.

Non-Road Diesel Fuel Rule – With this rule, USEPA set sulfur limitations for non-road diesel fuel, including marine vessels. This rule affects construction equipment and harbor craft, although the California Diesel Fuel Regulations generally pre-empt this rule. Diesel fuel used by off-road equipment and harbor craft was limited to 15 ppm sulfur content (ultra low sulfur diesel) starting January 1, 2010, for nonroad fuel, and June 2012 for locomotive and marine fuels.

Highway Diesel Fuel Rule – With this rule, USEPA set sulfur limitations for on-road diesel fuel to 15 ppm.

General Conformity Rule – Section 176(c) of the CAA states that a federal agency cannot support an action unless the agency determines that it will conform to the most recent USEPA-approved SIP, which is described below. This means that projects using federal funds or requiring federal approval must not: 1) cause or contribute to any new violation of a NAAQS; 2) increase the frequency or severity of any existing violation; or 3) delay the timely attainment of any standard, interim emission reduction, or other milestone.

In an area with a SIP, conformity can be demonstrated in one of four ways:

- By showing that the emission increases caused by an action are included in the SIP
- By demonstrating that the state agrees to include the emission increases in the SIP
- Through offsets
- Through mitigation

Under the existing regulations, de minimis emission levels are listed for each criteria pollutant. In creating de minimis emission levels, USEPA sought to limit the need to conduct conformity determinations for actions with minimal emission increases. When the total direct and indirect emissions from the actions are below the de minimis levels, the action would not be subject to a conformity determination. Annual emission rates per calendar year are used. The defined de minimis level is 25 tons/year for O_3 (ROG or NOx). Federal actions with emissions below this minimum threshold are not obligated to perform a conformity determination (YSAQMD 2007). The Proposed Project and alternatives would be required to demonstrate conformity under Section 176(c) of the CAA.

Council on Environmental Quality (CEQ) NEPA Guidance on Consideration of Effects of Climate Change and GHG Emissions – In February 2010, CEQ released a guidance memorandum intended to help explain how agencies of the federal government should analyze the environmental effects of GHG emissions and climate change when they describe the environmental effects of a proposed agency action in accordance with Section 102 of NEPA and the CEQ Regulations for Implementing the Procedural Provisions of NEPA, 40 CFR parts 1500-1508 (CEQ 2010). The guidance affirmed the requirements of the statute and regulations and their applicability to GHGs and climate change impacts. CEQ proposed to advise federal agencies that they should consider opportunities to reduce GHG emissions caused by proposed federal actions, adapt their actions to climate change impacts throughout the NEPA process, and address these issues in their agency NEPA procedures.

The guidance advised federal agencies to consider whether analysis of the direct and indirect GHG emissions from their proposed actions may provide meaningful information to decision makers and the public. Specifically, if a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of CO_2e GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. The guidance identified a "reference point" of 25,000 metric tons of direct CO_2e GHG emissions as an "indicator" that the proposed federal action's anticipated GHG emissions warrant detailed consideration in a NEPA review. For indirect GHG emissions (i.e., GHG emissions that have a causal nexus to, but are not directly emitted by, or the direct result of, the project), the guidance did not propose a reference point indicating when such indirect emissions are significant and cautioned that any consideration of indirect GHG emissions needed to recognize the limits of feasibility in evaluating upstream and downstream effects of proposed federal actions. The guidance did not propose this reference point as an indicator of a level of GHG emissions that may significantly affect the quality of the human environment, but rather as a minimum standard for reporting emissions under the CAA.

State Regulations

California Clean Air Act (CCAA) – The CCAA of 1988, as amended in 1992, outlines a program to attain the CAAQS by the earliest practical date. Because the CAAQS standards are more stringent than the NAAQS, attainment of the CAAQS requires more emissions reductions than what would be required to show attainment of the NAAQS. Consequently, the main focus of attainment planning in California has shifted from the federal to state requirements. Similar to the federal system, the state requirements and compliance dates are based on the severity of the CAAQS violation within a region.

State Implementation Plan – The Sacramento region is designated a nonattainment area for

the federal 8-hour O_3 air quality standard. Areas under nonattainment must undertake proactive planning to reach attainment, in response to which the YSAQMD developed the 1992 Air Quality Attainment Plan (AQAP; YSAQMD 2007). Progress under the SIP is assessed every 3 years. Although YSAQMD is not required to prepare a PM_{10} attainment plan, they have developed a list of particulate matter control measures they consider cost-effective. Similar plans have been prepared by the BAAQMD and the SMAQMD (BAAQMD 2009; SMAQMD 2009a).

Heavy Duty Diesel Truck Idling Regulation – This ARB rule requires that heavy-duty trucks shall not idle for longer than 5 minutes at a time, except if the queue is located beyond 100 feet from any homes or schools.

California Diesel Fuel Regulations – With this rule, the ARB set sulfur limitations for diesel fuel sold in California for use in on-road and off-road motor vehicles. Harbor craft were originally excluded from the rule, but were later included by a 2004 rule amendment. Under this rule, diesel fuel used in motor vehicles except harbor craft was limited to 15 ppm. (A federal diesel rule similarly limited sulfur content nationwide to 15 ppm by October 15, 2006.)

Statewide Portable Equipment Registration Program – The Portable Equipment Registration Program establishes a uniform program to regulate portable engines and portable engine-driven equipment units, which would apply to dredging equipment. Once registered in the Portable Equipment Registration Program, engines and equipment units may operate throughout California without the need to obtain individual permits from local air districts.

ARB Ocean Going Vessels (OGV) Fuel Rule – The rule regulates the sulfur content of fuel burned in OGV engines and boilers operating within 24 nautical miles of California. The rule requires that marine gas oil (DMA) at or below 1.5% sulfur or marine diesel oil (DMB) at or below 0.5% sulfur be used. The rule requires that starting January 1, 2012, marine gas oil (DMA) or marine diesel oil (DMB) at or below 0.1% sulfur be used.

ARB Harbor Craft Rule – Airborne Toxic Control Measure for Commercial Harbor Craft – In 2010, ARB approved a regulation to reduce emissions from diesel engines on commercial harbor craft vessels. The regulation applies to all commercial harbor craft vessels including, but not limited to, ferries, excursion vessels, tugboats, towboats, crew and supply vessels, work boats, pilot vessels, commercial and charter fishing boats, and dredging equipment. The regulation requires that engines on all new commercial harbor craft vessels meet the USEPA marine engine emission standards in effect at the time the vessel is acquired. The regulation also specifies low sulfur fuel use requirements for all harbor craft as well as

requires existing retrofit or replacement of in-use Tier 1 and earlier auxiliary and propulsion engines to USEPA Tier 2 or Tier 3 standards in effect at the time of regulation compliance.

Executive Order S-3-05 – California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, statewide GHG emission reduction targets as follows: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80% below 1990 levels. Some literature equates these reductions to 11% by 2010 and 25% by 2020.

Assembly Bill 32 - California Global Warming Solutions Act of 2006 – The purpose of AB 32 is to reduce statewide GHG emissions to 1990 levels by 2020. This enactment instructs the ARB to adopt regulations that reduce emissions from significant sources of GHGs and establish a mandatory GHG reporting and verification program by January 1, 2008. AB 32 requires the ARB to adopt GHG emission limits and emission reduction measures by January 1, 2011, both of which are to become effective on January 1, 2012. The ARB must also evaluate whether to establish a market-based cap and trade system. AB 32 does not identify a significance level of GHG for CEQA/NEPA purposes, nor has the ARB adopted such a significance threshold.

California Climate Change Scoping Plan – The Climate Change Scoping Plan is the state's roadmap to reach the GHG reduction goals required in the Global Warming Solutions Act of 2006, or AB 32. This plan calls for reductions in California's carbon footprint to 1990 levels and includes a number of strategies to achieve those levels. The Scoping Plan requires ARB and other state agencies to adopt regulations and other initiatives in 2010 and 2011.

Senate Bill 97 Chapter 185, Statutes of 2007 – Senate Bill (SB) 97 requires the Office of Planning and Research to prepare guidelines to submit to the California Resources Agency regarding feasible mitigation of GHG emissions or the effects of GHG emissions as required by CEQA.

Executive Order S-01-07 – Executive Order S-01-07 was enacted by Governor Arnold Schwarzenegger on January 18, 2007. The order mandates: 1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020; and 2) that a Low Carbon Fuel Standard for transportation fuels be established for California.

Amendments to the CEQA Guidelines – As directed by SB 97, the Natural Resources Agency adopted Amendments to the CEQA Guidelines for GHG emissions on December 30, 2009.

The Amendments, which became effective on March 18, 2010, address the analysis and mitigation of GHG emissions.

ARB Interim CEQA Thresholds – In October 2008, the ARB released its preliminary draft staff proposal recommending approaches for setting interim significance thresholds for GHGS under CEQA. The ARB thresholds apply to industrial projects and set a quantitative standard of 7,000 mty of CO_2 for operational emissions. The proposal does not set quantitative standards for construction emissions, but instead refers to a future development of performance standards for transport and construction activities.

Local Regulations and Agreements

Through the attainment planning process, the YSAQMD develops rules and regulations to regulate sources of air pollution in the SVAB. The emission sources associated with the alternatives under evaluation are considered mobile or portable sources and are not subject to the YSAQMD rules that apply to stationary sources. The YSAQMD rules that are most pertinent to the various alternatives are listed below.

Rule R2.5 – Nuisance – This rule prohibits discharge of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health, or safety of any such persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property.

District Rule 2.3 – Visible emissions from stationary diesel-powered equipment are not allowed to be as dark or darker than a shade that is designated as No. 1 opacity on the Ringelmann Chart for more than 3 minutes in any 1-hour period.

3.3.3.2 Methodology for Determining Impacts

Construction and operational emissions for the Proposed Project and alternatives were analyzed and compared to baseline conditions. Only marine sources were considered in quantifying emissions because the With-Project Economics Analysis conducted by USACE concluded that cargo throughput would be unaffected by the Proposed Project (USACE 2011). Both marine and land-based sources were considered in quantifying emissions and impacts due to construction activities.

3.3.3.2.1 Construction Emissions Assumptions

The following assumptions regarding the timing of placement site preparation and dredging were considered in the analysis:

- Preparation of placement sites would require approximately 2 days under Future without Project Conditions, and 3 months for construction of the Proposed Project or the -33 Feet MLLW Alternative (due to construction of berms). Placement sites would conservatively range between 200 and 500 acres in size, although sites' usable portions are smaller. It was assumed that the preparation of each placement site would occur sequentially (and thus only one placement site would be under construction at a given time).
- SMAQMD PM emission thresholds are concentration-based and require air dispersion modeling unless the project limits disturbed areas to less than 15 acres per day, and complies with "Basic Construction Emission Control Practices." This requirement potentially affects construction emissions at site S14 because the site consists of 19 usable acres. The SMAQMD assumes that 25% of the total usable acreage is disturbed on a maximum day, and therefore the maximum daily disturbed acreage at S14 is less than 15 acres. Air dispersion modeling is therefore not necessary for this site.
- Dredging in any given reach would take place following preparation of a placement site designated for that reach. It was estimated that dredging would take place over a 6-month period for construction of the Proposed Project or the -33 Feet MLLW Alternative. Routine maintenance dredging was assumed to require 6 weeks under Future without Project Conditions. It was assumed that the dredging of each reach would occur sequentially.
- Placement site preparation and dredging will not occur concurrently.

Table 52 presents the activity and equipment parameters for the types of emission sources of the Proposed Project and -33 Feet MLLW Alternative, which include harbor craft, dredging equipment, and off- and on-road mobile sources.

Table 52
Construction Source Activities and Characteristics

Activity	Source Category	Pieces of Equipment
Placement Site Preparation –3 Month Duration Annually		
Dozer	Off-Road, Land	1
Excavator	Off-Road, Land	1
Scraper	Off-Road, Land	2
Loader	Off-Road, Land	1
Water truck	Off-Road, Land	1
20 cy trucks to haul soil and debris	On-Road	2
Workers	On-Road	8
Hydraulic Dredging – 6 Month Duration Annually		
Dredging equipment	Off-Road, Marine	1 main engine
		1 genset engine
		1 crane/derrick

Activity	Source Category	Pieces of Equipment
Push tug	Harbor Craft	1
Dredge tender	Harbor Craft	1
Pipeline tender	Harbor Craft	1
Work/crew boat	Harbor Craft	1
Dozer	Off-Road, Land	1
Excavator	Off-Road, Land	1
Workers	On-Road	6

Construction equipment would be diesel-fueled and would generate emissions of diesel exhaust in the form of ROG, CO_2, NOx, sulfur oxides (SOx), PM_{10}, and $PM_{2.5}$. GHG emissions would also be generated from these sources. Equipment usage and scheduling data required to quantify emissions for construction activities were obtained from engineering specifications and consultation with contractors/engineers. Emissions were first calculated for the individual equipment and then summed within each phase (Appendix P).

3.3.3.2.2 Operational Emissions

Operational activities would include the transit of OGVs along the SRDWSC and hotelling while at the Port. The USACE's *With-Project Economics Analysis* did not estimate future vessel calls. Estimates for future vessel calls were calculated based on forecasted commodity throughput, vessel size, and fleet mix, and are presented in Table 3. The fleet mix for each vessel type and class was scaled by throughput and vessel payload, where payload represents the weight of commodity that can be loaded on a vessel such that the vessel still clears the available draft of the channel.

In addition, the operational activities evaluated in this Draft SEIS/SEIR include the harbor craft used to maneuver OGVs through the Port harbor and those associated with the anticipated barge service (Port of West Sacramento 2010; TIGER 2010). Criteria pollutant and GHG emissions from OGV propulsion engines, auxiliary engines, and auxiliary boilers were quantified during OGV transit, maneuvering, berth hotelling, and anchorage hotelling. Criteria pollutant and GHG emissions from harbor craft used to assist OGV vessels and harbor craft used during barge service were also quantified.

3.3.3.3 Thresholds of Significance

The significance thresholds for this project incorporate standards established by the YSAQMD, SMAQMD, and BAAQMD for construction because construction activities would occur in each of these air districts. However, because the overwhelming majority of operational emissions associated with vessel traffic and berthing at the Port would occur in the YSAQMD, the significance threshold for operational activities (AQ-3) was based on YSAQMD standards. The air quality district guidance does not address GHG emissions.

Therefore, threshold AQ-7 was evaluated without judgment as to significance.

An alternative could have an impact on air quality (abbreviated as AQ in the thresholds and mitigation measures in this section) if it would cause the following:

- AQ-1: Conflict with, or obstruct implementation of, the applicable air quality plan
- AQ-2: Construction emissions would result in the violation of any air quality standard or substantial contribution to an existing or projected air quality violation, per the thresholds set forth by the YSAQMD, SMAQMD, and BAAQMD as shown in Table 53

Table 53
Thresholds of Significance for Criteria Pollutants

Pollutant	YSAQMD	SMAQMD	BAAQMD
PM_{10}	80 lbs/peak day	Concentration-based [1]	82 lb exhaust/average day
$PM_{2.5}$	N/A	Concentration-based [1]	54 lb exhaust/average day
NOx	10 tons/year	85 lb/peak day	54 lb/average day
ROG	10 tons/year	N/A	54 lb/average day
CO	Violation of a state ambient air quality standard for CO	Violation of a state ambient air quality standard for CO	Violation of a state ambient air quality standard for CO

Notes:

1 SMAQMD significance threshold for PM_{10} and $PM_{2.5}$ are concentration based. Air dispersion modeling is not required if less than 15 acres would be disturbed on a maximum day and if the project conforms with the SMAQMD's Basic Construction Emission Controls and Practices." Placement site S14 is the only site in the SMAQMD. The site is 19 usable acres. The SMAQMD's default for peak daily site disturbance is 25% of total site. 25% of 19 acres is less than the 15 maximum daily screening threshold.

N/A: not applicable

Sources: YSAQMD 2007; SMAQMD 2009b; BAAQMD 2010

- AQ-3: Operational emissions would result in the violation of any air quality standard or substantial contribution to an existing or projected air quality violation, per the thresholds set forth by YSAQMD shown in Table 53 (project operational emissions overwhelmingly occur in the YSAQMD; therefore, only YSAQMD thresholds were used for this evaluation)
- AQ-4: Cumulatively considerable net increase of any criteria pollutant for which the study area is non-attainment under an applicable federal or state ambient air quality standard (including releasing of emissions that exceed quantitative thresholds for O_3 precursors)
- AQ-5: Creation of objectionable odors affecting a substantial number of people
- AQ-6: Non-conformance to the SIP through annual emissions greater than 25 tons for O_3 precursors (ROG or NOx)

- **AQ-7:** Generation of GHGs that may have a significant impact on the environment, or conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs
- **AQ-8**: Exposure of sensitive receptors to TACs from stationary sources[20] in excess of the following thresholds:
  - Probability of contracting cancer for the maximally exposed individual equals 10 in one million or more
  - Ground-level concentrations of non-carcinogenic TACs would result in a hazard index for the maximally exposed individual equal to 1 or greater

Emissions calculations were compared to environmental baseline emissions in order to determine an increment of impact.

3.3.3.4 Impacts and Mitigation Measures

AQ-1: Conflict with, or obstruct implementation of, the applicable air quality plan

Future without Project Conditions (NEPA and CEQA Baseline)

Dredging and commercial vessel operations under Future without Project Conditions activities would continue to produce emissions of nonattainment pollutants. As previously discussed, the YSAQMD AQAP set forth emission reduction measures designed to bring the SVAB into attainment of the CAAQS and NAAQS. The attainment strategies in the AQAP include mobile-source control measures and clean fuel programs that are enforced at the state and federal level on engine manufacturers and petroleum refiners and retailers; as a result, activities occurring under Future without Project Conditions operations would be required to comply with these control measures. YSAQMD also adopts AQAP control measures into its rules and regulations, which are then used to regulate sources of air pollution in the SVAB. Thus, there would be no impacts to the implementation of applicable air quality plans under Future without Project Conditions.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

[20] Although YSAQMD's Risk Management Policy provides a basis for a threshold for TACs from stationary sources, the policy does not cover TACs from mobile sources. As such, no specific mobile source TAC threshold is referenced in the YSAQMD Handbook, and while YSAQMD continues to evaluate a threshold of significance for mobile source TAC, no specific mobile source TAC threshold is proposed at this time.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

As with Future without Project Conditions, Proposed Project operations would produce emissions of nonattainment pollutants. Compliance with applicable YSAQMD AQAP requirements would ensure that the Proposed Project would not conflict with or obstruct implementation of the AQAP. Thus, as compared to the environmental baseline, there would be no impacts to implementation of the applicable air quality plan as a result of the Proposed Project.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

Similar to the Proposed Project, -33 Feet MLLW Alternative operations would produce emissions of nonattainment pollutants. Compliance with applicable requirements would ensure that the -33 Feet MLLW Alternative would not conflict with or obstruct implementation of the AQAP. Thus, as compared to the environmental baseline, there would be no impacts to implementation of the applicable air quality plan as a result of the -33 Feet MLLW Alternative.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

AQ-2: Construction emissions would result in a violation of any air quality standard or substantial contribution to an existing or projected air quality violation

Future without Project Conditions (NEPA and CEQA Baseline)

Ongoing maintenance dredging would continue to occur under Future without Project Conditions. Annual maintenance dredging averages approximately 190,000 cubic yards (cy) per year and lasts an average of 6 weeks, as described in Section 2.2.1.1. Site preparation is assumed to require a maximum of 2 days under Future without Project Conditions. Emissions due to future maintenance dredging under baseline conditions were scaled from Proposed Project emissions based on these assumptions. The emissions under Future without Project Conditions are indicated as environmental baseline emissions on Tables 54 and 55 below.

For purposes of this evaluation, Future without Project Conditions construction emissions define the environmental baseline; as such, there is no incremental change against which to compare the construction emissions. As such, there would be no construction impacts to air quality considered significant under Future without Project Conditions.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

The construction emissions of the Proposed Project, prior to mitigation, are compared to YSAQMD, SMAQMD, and BAAQMD significance thresholds in Table 4.6 in Appendix P. A summary of the criteria air pollutants for which the Proposed Project's emissions would exceed the significance thresholds, after accounting for baseline emissions, is provided in Table 54. Emissions from Future without Project Conditions are shown as the environmental baseline, and the incremental change is used to determine significance.

Table 54
Summary of Construction Emissions without Mitigation

Analysis Year		Emissions			
		PM_{10} (lb/day) peak Threshold: 80 (YSAQMD)	NOx (tpy) average Threshold: 10 (YSAQMD)	NOx (lb/day) peak Threshold: 85 (SMAQMD)	NOx (lb/day) average Threshold: 54 (BAAQMD)
2011	Total	1,254	63	729	729
	Environmental Baseline	151	14	170	169
	Incremental Change	1,103	49	559	560
2012	Total	1,254	60	692	691
	Environmental Baseline	151	14	170	169
	Incremental Change	1,103	46	522	522
2013	Total	1,253	57	655	655
	Environmental Baseline	151	14	170	169
	Incremental Change	1,102	43	485	486
2014	Total	1,253	47	540	540
	Environmental Baseline	151	14	170	169
	Incremental Change	1,102	33	370	371
2015	Total	1,253	46	524	523
	Environmental Baseline	151	14	170	169
	Incremental Change	1,102	32	354	354

Table 54 shows that the incremental change in emissions for each criteria pollutant would exceed significance thresholds for PM_{10} and NOx for all construction years in YSAQMD, SMAQMD, and BAAQMD. PM_{10} emissions would be driven by fugitive dust generated during placement site preparation activities. YSAQMD's thresholds for PM_{10} are presented in pounds per peak day. Peak daily emissions represent a maximum theoretical activity scenario and would rarely, if ever, occur. NOx emissions would be driven by emissions from dredging equipment. Thus, as compared to the environmental baseline, there would be potentially significant incremental impacts to air quality due to PM_{10} and NOx as a result of construction of the Proposed Project. The mitigation measures below are proposed to reduce

and control the construction-related air quality impacts (refer to Table 20 for complete descriptions of mitigation measures).

Mitigation Measures:

- AQ-MM-1: Apply soil stabilizers to inactive areas
- AQ-MM-2: Replace ground cover in disturbed areas
- AQ-MM-3: Water exposed surfaces three times daily
- AQ-MM-4: Reduce speed on unpaved roads to less than 15 miles per hour (mph)
- AQ-MM-5: Utilize diesel particulate filter (DPF) on land-side off-road construction equipment
- AQ-MM-6: Utilize selective catalytic reduction (SCR) on dredging equipment

Residual Impact after Mitigation: The construction emissions of the Proposed Project after mitigation relative to the environmental baseline are compared to the significance thresholds in Table 55.

Table 55
Summary of Construction Emissions with Mitigation

Analysis Year		Emissions			
		PM_{10} (lb/day) peak Threshold: 80 (YSAQMD)	NOx (tpy) average Threshold: 10 (YSAQMD)	NOx (lb/day) peak Threshold: 85 (SMAQMD)	NOx (lb/day) average Threshold: 54 (BAAQMD)
2011	Total	79	20	201	201
	Environmental Baseline	151	14	170	169
	Incremental Change	-72	6	31	32
2012	Total	76	19	193	193
	Environmental Baseline	151	14	170	169
	Incremental Change	-75	5	23	24
2013	Total	76	19	185	185
	Environmental Baseline	151	14	170	169
	Incremental Change	-75	5	15	16
2014	Total	76	16	161	161
	Environmental Baseline	151	14	170	169
	Incremental Change	-75	2	-9	-8
2015	Total	76	16	157	156
	Environmental Baseline	151	14	170	169
	Incremental Change	-75	2	-13	-13

With incorporation of the above mitigation, PM_{10} and NOx emissions would decrease below significance levels. Therefore, the residual impact would be less than significant.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

Construction emissions for the -33 Feet MLLW Alternative would be identical to those under the Proposed Project because equipment and operating hours would be the same on a daily and annual basis, with the exception that construction would end in 2013, 2 years earlier than the Proposed Project. Therefore, although construction of the Proposed Project would result in greater emissions overall than the -33 Feet MLLW Alternative, impacts would be the same on a daily and annual basis. Construction emissions for the years 2011 through 2013 are shown in Table 54. Thus, as compared to the environmental baseline, there would be potentially significant incremental impacts due to PM_{10} and NOx, as a result of construction of the -33 Feet MLLW Alternative. The mitigation measures below are proposed to reduce and control the construction-related air quality impacts (refer to Table 20 for complete descriptions of mitigation measures).

Mitigation Measures:

- AQ-MM-1: Apply soil stabilizers to inactive areas
- AQ-MM-2: Replace ground cover in disturbed areas
- AQ-MM-3: Water exposed surfaces three times daily
- AQ-MM-4: Reduce speed on unpaved roads to less than 15 mph
- AQ-MM-5: Utilize DPF on land-side off-road construction equipment
- AQ-MM-6: Utilize SCR on dredging equipment

Residual Impact after Mitigation: Similar to the Proposed Project, with incorporation of the above mitigation, PM_{10} and NOx emissions would decrease below significance levels (Table 55). Therefore, the residual impact would be less than significant.

AQ-3: Operational emissions would result in a violation of any air quality standard or substantial contribution to an existing or projected air quality violation

Future without Project Conditions (NEPA and CEQA Baseline)

Operational emissions associated with Future without Project Conditions reflect an increase in vessels on the SRDWSC, as shown in Table 3. Table 56 compares Future without Project Conditions operational emissions, prior to mitigation, to YSAQMD's significance thresholds.

Table 56
Summary of Future without Project Conditions Operational Emissions without Mitigation

Analysis Year	Emissions				
	PM_{10} (lb/day) peak	PM_{10} (lb/day)	NOx (tpy) average	ROG (tpy) average	CO_2e (mty)
2008	648	9	37	1	2,291
2011	462	24	63	3	4,176

Analysis Year	Emissions				
	PM_{10} (lb/day) peak	PM_{10} (lb/day)	NOx (tpy) average	ROG (tpy) average	CO_2e (mty)
2012	332	25	86	4	6,759
2013	332	26	93	4	7,258
2015	332	27	100	4	7,924
2018	332	28	109	5	8,884
2023	333	29	120	5	9,951
2028	333	30	127	6	10,297
2033	333	31	134	6	10,683
2053	333	31	139	6	10,961
2062	333	31	139	6	10,986

For purposes of this evaluation, Future without Project Conditions operational emissions define the environmental baseline; as such, there is no incremental change against which to compare the operational emissions. As described earlier in this section, because the Proposed Project is not growth inducing, its operational conditions on the SRDWSC are considered equivalent under both projected CEQA Baseline and NEPA Future without Project Conditions. Consequently, a combined analysis is presented and as such, there would be no operational impacts to criteria pollutants considered significant under Future without Project Conditions.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

Table 57 compares the Proposed Project's operational emissions, prior to mitigation, to YSAQMD's significance thresholds. The evaluation accounts for the operational baseline emissions calculated for Future without Project Conditions.

Table 57
Summary of Proposed Project Operational Emissions without Mitigation

Analysis Year		Emissions				
		PM_{10} (lb/day) peak Threshold: 80	PM_{10} (lb/day) Threshold: N/A	NOx (tpy) average Threshold: 10	ROG (tpy) average Threshold: 10	CO_2e (mty) Threshold: 7,000
2015	Total	332	24	77	4	6,036
	Environmental Baseline	332	27	100	4	7,924
	Incremental Change	0	-3	-23	0	-1,888
2018	Total	350	25	83	4	6,701

Analysis Year		Emissions				
		PM_{10} (lb/day) peak Threshold: 80	PM_{10} (lb/day) Threshold: N/A	NOx (tpy) average Threshold: 10	ROG (tpy) average Threshold: 10	CO_2e (mty) Threshold: 7,000
	Environmental Baseline	332	28	109	5	8,884
	Incremental Change	18	-3	-26	-1	-2,183
2023	Total	351	26	91	4	7,440
	Environmental Baseline	333	29	120	5	9,951
	Incremental Change	18	-3	-29	-1	-2,511
2028	Total	351	26	96	4	7,679
	Environmental Baseline	333	30	127	6	10,297
	Incremental Change	18	-4	-31	-2	-2,618
2033	Total	351	27	101	4	7,946
	Environmental Baseline	333	31	134	6	10,683
	Incremental Change	18	-4	-33	-2	-2,737
2053	Total	351	27	104	6	8,139
	Environmental Baseline	333	31	139	6	10,961
	Incremental Change	18	-4	-35	0	-2,822
2062	Total	351	27	104	6	8,156
	Environmental Baseline	333	31	139	6	10,986
	Incremental Change	18	-4	-35	0	-2,830

Notes:
Total OGV emissions are represented by the maximum of the bulk carriers and the general carriers, plus tankers. This is because Port berths can only be occupied by a set number of OGVs on any given day.

Table 57 shows the estimated incremental change in operational emissions of the Proposed Project as compared to Future without Project Conditions. The evaluation indicates that PM_{10} emissions would increase over time, but would not exceed the YSAQMD thresholds. Thus, there would be less than significant incremental impacts to air quality as a result of operation of the Proposed Project.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: The residual impact would be less than significant.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

Table 58 compares the -33 Feet MLLW Alternative's operational emissions, prior to mitigation, to YSAQMD's significance thresholds. The evaluation accounts for the operational baseline emissions calculated for Future without Project Conditions.

Table 58
Summary of Channel Deepening to -33 Feet MLLW and Selective Widening Alternative Operational Emissions without Mitigation

Analysis Year		Emissions				
		PM_{10} (lb/day) peak Threshold: 80	PM_{10} (lb/day) Threshold: N/A	NOx (tpy) average Threshold: 10	ROG (tpy) average Threshold: 10	CO_2e (mty) Threshold: 7,000
2013	Total	332	24	79	4	6,154
	Environmental Baseline	332	26	93	4	7,258
	Incremental Change	0	-2	-14	0	-1,104
2015	Total	332	24	82	4	6,490
	Environmental Baseline	332	27	100	4	7,924
	Incremental Change	0	-3	-18	0	-1,434
2018	Total	332	26	92	4	7,451
	Environmental Baseline	332	28	109	5	8,884
	Incremental Change	0	-2	-17	-1	-1,433
2023	Total	333	27	101	5	8,304
	Environmental Baseline	333	29	120	5	9,951
	Incremental Change	0	-2	-19	0	-1,647
2028	Total	333	27	106	5	8,580
	Environmental Baseline	333	30	127	6	10,297
	Incremental Change	0	-3	-21	-1	-1,717
2033	Total	333	28	112	5	8,887
	Environmental Baseline	333	31	134	6	10,683
	Incremental Change	0	-3	-22	-1	-1,796
2053	Total	333	28	116	5	9,110
	Environmental Baseline	333	31	139	6	10,961
	Incremental Change	0	-3	-23	-1	-1,851
2062	Total	333	28	116	6	9,130
	Environmental Baseline	333	31	139	6	10,986
	Incremental Change	0	-3	-23	0	-1,856

Table 58 shows that the estimated incremental change in operational emissions of the -33 Feet MLLW Alternative as compared to Future without Project Conditions. Similar to the Proposed Project, PM_{10} emissions would increase over time, but would not exceed the YSAQMD thresholds. Thus, there would be less than significant incremental impacts to air quality as a result of operation of the -33 Feet MLLW Alternative.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: The residual impact would be less than significant.

AQ-4: Cumulatively considerable net increase of any criteria pollutant for which the study area is non-attainment under an applicable federal or state ambient air quality standard (including release of emissions that exceed quantitative thresholds for O_3 precursors)

Future without Project Conditions (NEPA and CEQA Baseline)

Under Future without Project Conditions, there would not be a cumulatively considerable net increase in a criteria pollutant for which the study area is non-attainment. As shown in Table 56, Future without Project Conditions operational emissions define the environmental baseline; as such, there is no incremental change against which to compare the operational emissions to thresholds. Thus, there would be no impacts due to cumulative net increase of criteria pollutants.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

The study area is in non-attainment for O_3 and PM_{10}. The YSAQMD CEQA Handbook stipulates that a project be considered cumulatively significant if it individually has a significant air quality impact under the YSAQMD thresholds of significance. In addition, a project would be considered cumulatively significant for CO impacts if its emissions combined with emissions of other existing and planned projects exceed air quality standards. YSAQMD's CO screening criteria estimate whether or not a project's traffic impact would cause a potential CO hotspot at any given intersection. As Proposed Project construction activities would not result in on-road sources beyond several truck trips during placement site preparation, the Proposed Project would not result in CO impacts.

Operational PM_{10} emissions increase over time but would not incrementally increase above YSAQMD thresholds as compared to Future without Project Conditions (Table 57). As shown in Table 54, the Proposed Project would exceed YSAQMD, BAAQMD, and SMAQMD significance thresholds for construction emissions prior to mitigation. Thus, there could be potentially significant incremental impacts due to net increases of criteria pollutants as a result of construction the Proposed Project. The mitigation measures below are proposed to reduce and control the construction-related air quality impacts (refer to Table 20 for complete descriptions of mitigation measures).

Mitigation Measures:

- AQ-MM-1: Apply soil stabilizers to inactive areas
- AQ-MM-2: Replace ground cover in disturbed areas
- AQ-MM-3: Water exposed surfaces three times daily
- AQ-MM-4: Reduce speed on unpaved roads to less than 15 mph

- AQ-MM-5: Utilize DPF on land-side off-road construction equipment
- AQ-MM-6: Utilize SCR on dredging equipment

Residual Impact after Mitigation: After inclusion of the mitigation measures, construction emissions would decrease to below significant as shown in Table 55. Therefore, the residual impact would be less than significant.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

As with the Proposed Project, on-road traffic related to construction of the -33 Feet MLLW Alternative would not result in any CO impacts. As is shown in Table 58 and similar to the Proposed Project, operational PM_{10} emissions under the -33 Feet MLLW Alternative would not lead to any incremental increases in emissions of criteria pollutants above YSAQMD threshold values as compared to Future without Project Conditions.

The -33 Feet MLLW Alternative would also exceed YSAQMD, BAAQMD, and SMAQMD significance thresholds for PM_{10} and NOx associated with construction emissions, as shown in Table 54, resulting in potentially significant impacts. The mitigation measures below are proposed to reduce and control the construction-related air quality impacts (refer to Table 20 for complete descriptions of mitigation measures).

Mitigation Measures:

- AQ-MM-1: Apply soil stabilizers to inactive areas
- AQ-MM-2: Replace ground cover in disturbed areas
- AQ-MM-3: Water exposed surfaces three times daily
- AQ-MM-4: Reduce speed on unpaved roads to less than 15 mph
- AQ-MM-5: Utilize DPF on land-side off-road construction equipment
- AQ-MM-6: Utilize SCR on dredging equipment

Residual Impact after Mitigation: After inclusion of the mitigation measures, construction emissions would decrease to below significant levels, as shown in Table 55. In addition, construction of the -33 Feet MLLW Alternative requires 2 fewer years than the Proposed Project. Therefore, the residual impact would be less than significant.

AQ-5: Creation of objectionable odors affecting a substantial number of people

Future without Project Conditions (NEPA and CEQA Baseline)

Emissions of air pollutants due to future dredging and marine vessel operations would continue to increase under Future without Project Conditions. Although some individuals may find diesel combustion emissions to be objectionable, odorous impacts of these emissions are subjective in nature. In addition, the mobile nature of Future without Project Conditions emission sources would serve to disperse emissions. Thus, there would be less than

significant impacts to the creation of any objectionable odors affecting a substantial number of people under Future without Project Conditions.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: The residual impact would be less than significant.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

Odor impacts would be similar to those under Future without Project Conditions, and the mobile nature of Proposed Project emission sources would serve to disperse emissions. Thus, as compared to the environmental baseline, there would be less than significant incremental impacts from objectionable odors as a result of the Proposed Project.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: The residual impact would be less than significant.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

Odor impacts would be consistent with those of the Proposed Project. Thus, as compared to the environmental baseline, there would be less than significant incremental impacts from objectionable odors as a result of the -33 Feet MLLW Alternative.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: The residual impact would be less than significant.

AQ-6: Non-conformance to the SIP

Future without Project Conditions (NEPA and CEQA Baseline)

Under baseline conditions, operational air emissions would continue to occur. The SIP accounts for regional growth as part of the attainment strategy. Thus, there would be no impacts to conformance with the SIP under Future without Project Conditions.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

Table 57 shows that the incremental changes in the operational emissions of the Proposed Project as compared to Future without Project Conditions would not exceed the de minimus level of 25 tons per year. As a result, the Proposed Project would conform to the SIP.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

Table 58 shows that the incremental changes in the operational emissions of the -33 Feet MLLW Alternative as compared to Future without Project Conditions would not exceed the

de minimus level of 25 tons per year. As a result, the -33 Feet MLLW Alternative would conform to the SIP.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

AQ-7: Generation of GHGs that may have a significant impact on the environment, or conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs

Future without Project Conditions (NEPA and CEQA Baseline)

As is noted in Section 3.3.3.3, there are currently no federal standards for GHG emissions. Table 56 shows that Future without Project Conditions operational CO_2e emissions would be below CEQ's reference level of 25,000 mty emissions in all analysis years. CEQ's reference level does not constitute a significance threshold, but rather indicates the level at which GHG emissions should be disclosed. In addition, CO_2e emissions would be below the ARB interim GHG significance threshold for all analysis years. Thus, the anticipated emissions are disclosed relative to Future without Project Conditions without expressing judgment as to their significance.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: Anticipated emissions are disclosed without expressing judgment as to their significance.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

The CEQ reference level of 25,000 mty applies to direct long-term activities. Since construction activities are considered short-term in nature, only long-term operational activities resulting in GHG emissions were considered for this impact analysis. Table 57 shows that the Proposed Project's operational CO_2e emissions would be below ARB interim GHG thresholds. ARB's GHG Scoping Plan provides a roadmap to reach the GHG reduction goals required in the Global Warming Solutions Act of 2006, or AB 32. Many of the strategies in the Scoping Plan and anticipated regulatory framework would include measures enforced at the state level and imposed on equipment manufacturers and fuel suppliers (clean fuels, clean ship measures) (ARB 2008); as a result, Proposed Project operations would comply with the regulatory framework resulting from the Scoping Plan. Table 57 also shows that the Proposed Project's CO_2e emissions would be below CEQ's reference level of 25,000 mty emissions in all analysis years, and that the total CO_2e emissions resulting from operations would be less than Future without Project Conditions emissions for every project analysis year. CEQ's reference level does not constitute a significance threshold, but rather indicates the level at which GHG emissions should be disclosed. Therefore, the anticipated

emissions of the Proposed Project are disclosed without expressing judgment as to their significance.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: Anticipated emissions are disclosed without expressing judgment as to their significance.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

Table 58 shows that the -33 Feet MLLW Alternative's operational CO_2e emissions would be below ARB interim GHG thresholds and CEQ's reference level of 25,000 mty emissions in all analysis years. Table 58 also shows that the total CO_2e emissions resulting from operations would be less than Future without Project Conditions emissions for every project analysis year. CEQ's reference level does not constitute a significance threshold, but rather indicates the level at which GHG emissions should be disclosed. Therefore, the anticipated emissions of the -33 Feet MLLW Alternative are disclosed without expressing judgment as to their significance.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: Anticipated emissions are disclosed without expressing judgment as to their significance.

AQ-8: Exposure of sensitive receptors to TACs from stationary sources in excess of thresholds

Future without Project Conditions (NEPA and CEQA Baseline)

Future without Project Conditions would not expose sensitive receptors to substantial pollutant concentrations or to TACs from stationary sources in excess of thresholds set forth by YSAQMD. Thus, there would be no impacts from exposing sensitive receptors to substantial pollutant concentrations under Future without Project Conditions.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

The Proposed Project would not expose sensitive receptors to substantial pollutant concentrations or to TACs from stationary sources in excess of thresholds set forth by the YSAQMD, SMAQMD, or BAAQMD. Thus, as compared to the environmental baseline, there would be no impacts to the exposure of sensitive receptors to substantial pollutant concentrations as a result of the Proposed Project.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

The -33 Feet MLLW Alternative would not expose sensitive receptors to substantial pollutant concentrations or to TACs from stationary sources in excess of thresholds set forth by the YSAQMD, SMAQMD, or BAAQMD. Thus, as compared to the environmental baseline, there would be no impacts to the exposure of sensitive receptors to substantial pollutant concentrations as a result of the -33 Feet MLLW Alternative.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

3.3.3.4.1 Summary of Impacts and Mitigation Measures

Table 59 summarizes the impact determinations, mitigation measures, and residual impacts after mitigation, if applicable, for each alternative with respect to the air quality impacts described above.

Table 59
Summary of Air Quality Resource Impacts and Mitigation Measures

Alternative	Impact	Mitigation	Residual Impact After Mitigation
AQ-1: Conflict with, or obstruct implementation of, the applicable air quality plan			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	No impact	None	None
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	No impact	None	None
AQ-2: Construction emissions would result in the violation of any air quality standard or substantial contribution to an existing or projected air quality violation			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	Potentially significant impact	AQ-MM-1, 2, 3, 4, 5, and 6	Less than significant impact
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	Potentially significant impact	AQ-MM-1, 2, 3, 4, 5, and 6	Less than significant impact
AQ-3: Operational emissions would result in the violation of any air quality standard or substantial contribution to an existing or projected air quality violation			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	Less than significant impact	None	Less than significant impact
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	Less than significant impact	None	Less than significant impact

AQ-4: Cumulatively considerable net increase of any criteria pollutant for which the study area is non-attainment under an applicable federal or state ambient air quality standard (including release of emissions that exceed quantitative thresholds for O_3 precursors)			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	Potentially significant impact	AQ-MM-1, 2, 3, 4, 5, and 6	Less than significant impact
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	Potentially significant impact	AQ-MM-1, 2, 3, 4, 5, and 6	Less than significant impact
AQ-5: Creation of objectionable odors affecting a substantial number of people			
Future without Project Conditions (NEPA and CEQA Baseline)	Less than significant impact	None	Less than significant impact
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	Less than significant impact	None	Less than significant impact
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	Less than significant impact	None	Less than significant impact
AQ-6: Non-conformance to the SIP			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	No impact	None	None
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	No impact	None	None
AQ-7: Generation of GHGs that may have a significant impact on the environment, or conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs			
Future without Project Conditions (NEPA and CEQA Baseline)	N/A	None	N/A
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	N/A	None	N/A
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	N/A	None	N/A
AQ-8: Exposure of sensitive receptors to TACs from stationary sources in excess of thresholds			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	No impact	None	None
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	No impact	None	None

3.3.4 Noise

This section provides baseline noise conditions and assesses potential noise impacts from the Proposed Project and alternatives.

3.3.4.1 Baseline Conditions

This section discusses basic characteristics of noise and sound, existing noise sources,

sensitive receptors found within the study area, and the regulatory framework for evaluating noise impacts.

3.3.4.1.1 Characteristics of Noise and Sound

Sound is a physical phenomena produced when particles vibrate (Prout and Bienvenue 1991). Pressure changes are generated when these vibrating objects (sound sources) cause regions of high and low pressure, which propagate away from the source, constituting a sound wave. Sound waves travel via a medium, such as air or water. Noise is a subjective classification of a sound and is often defined as an "unwanted sound" that is intrusive or disruptive to daily life. As such, a receiver can determine that a sound is noise based on their perception. Receivers perceive pitch, which is related to a sound's frequency and waveform, and loudness, which is related to the intensity of a sound.

Sound or noise is typically discussed in terms of frequency, intensity, power, and pressure (Prout and Bienvenue 1991). The standard measurement unit for sound or noise is decibels (dB), which is a ratio of a measured value to a reference level. A receiver's perception of a sound is related to a complex combination of sound frequency, intensity, power, and pressure. For example, in humans, mid-frequency sounds are generally perceived to be louder than low or high frequency sounds. To account for this, weighting filters were designed to reduce the contribution of low and high frequencies to a measured sound. This produces a reading that is similar to what humans would hear. "A weighting" is one such weighting filter. The A-weighted sound level is measured in decibels, written "dBA;" this and other common terminology used to characterize sound are presented in Table 60.

Table 60
Common Terminology Used to Characterize Sound

Term	Definition
dB	A unit of measurement describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, with is 20 micropascals (20 micronewtons per square meter).
dBA	The sound level in dB as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of sound similar to the response of the human ear and provides a correlation with subjective reactions to noise.
Leq	The average A-weighted noise level during the measurement period, typically computed over a 1, 8, or 24 hour sample period.
Community Noise Equivalent Level (CNEL)	The average equivalent A-weighted sound level during a 24-hour day, obtained after adding 5 dB to sound level measurements taken in the evening from 7 to 10 p.m. and 10 dB added to measurements taken at night between 10 p.m. and 7 a.m.
Ldn	The average equivalent A-weighted sound level during a 24-hour day obtained after adding 10 dB to sound level measurements taken in the night between 10 p.m. and 7 a.m.

Term	Definition
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.

Table source: GOPR 2003

Since noise intensity varies over time, measuring the average energy of sound over a specific period is necessary for quantifying noise levels. One method for doing this is to determine the equivalent sound level (Leq), which measures the average acoustic energy of sound over a given period of time. Another method is the day-night average sound level (Ldn), which measures the average noise levels for a 24-hour period, with the addition of 10 dB to noise levels occurring between 10 p.m. and 7 a.m. to account for increased noise sensitivity at night. A similar method is the community noise equivalent level (CNEL), which adds 5 dB to evening noise levels between 7 p.m. and 10 p.m., as well as 10 dB for nighttime noise (GOPR 2003).

Sound characteristics can change during propagation, especially over long distances or in complex environments. A sound will lose energy with distance at a rate that is determined by its frequency and source level. In addition, environmental conditions, such as substrate type and propagation medium, can affect the distance and direction of sound propagation (Prout and Bienvenue 1991). Two primary sources of noise are point source and line source noise, as follows:

- Point source noise is associated with activities such as construction and occurs from a source that remains in one place for extended periods of time. Sound pressure levels typically decrease by 6 dB with each doubling of distance from a point source noise.
- Line source noise is associated with multiple point sources, such as roadway traffic, which move in one direction. Sound pressure levels typically decrease by 3 dB with each doubling of distance from a line source noise (Knauer et al. 2000).

When more than one noise source is present, the resulting noise level is affected by the difference in noise level between the two sources as well as the noise associated with the original sources (WSDOT 2010). When two noises are combined, the rules in Table 61 are used to estimate the resulting noise (WSDOT 2010). When more than two noises occur together, the two lowest noises are summed, adjusted per the rules in the table, and then the third noise source is added and adjusted per the rules in the table (WSDOT 2010).

Table 61
Rules for Combining Noise Levels

When two decibel values differ by	Add the following to the higher decibel value
0 or 1 dBA	3 dBA
2 or 3 dBA	2 dBA
4 to 9 dBA	1 dBA
10 dBA or more	0 dBA

Source: WSDOT 2010

3.3.4.1.2 Regulatory Framework

This section describes noise standards and guidelines as established by federal, state, and local governments regarding noise control.

Federal

The Federal Noise Control Act of 1972 (42 USC 4901 to 4918) was established to protect human health and welfare from adverse noise impacts. Major sources of noise that are regulated by the Act include transportation vehicles and equipment, machinery, appliances, and other products used for commerce. The Act states that although federal action is significant for noise control in commerce, primary responsibility rests on state and local governments. Table 62 is extracted from *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (USEPA 1974) and provides acceptable indoor and outdoor noise levels.

Table 62
Summary of Noise Levels Identified as Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety

Effect	Level	Area
Hearing Loss	$L_{eq(24)}$ =<70 dB	All areas
Outdoor activity interference and annoyance	L_{dn} =55 dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use
	$L_{eq(24)}$ =<55 dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	L_{dn} =<45 dB	Indoor residential areas
	$L_{eq(24)}$ =<45dB	Other indoor areas with human activities such as schools, etc.

Note: The hearing loss level represents a yearly average comparable to daily exposure over a 40-year timeframe.
Source: USEPA 1974

State

The Governor's Office of Planning and Research *State of California General Plan Guidelines* (GOPR 2003) complements the California Code by providing a template to local jurisdictions

for development of general plans, including (but not limited to) a noise element. The guidelines assert that the noise element cover issues and sources of noise pertinent to the local planning area. Issues include major noise sources (mobile and stationary) and existing and proposed sensitive receptors, including hospitals, convalescent homes, schools, churches, and sensitive wildlife habitat, including the habitat of rare, threatened, or endangered species. The state guidelines set a CNEL of 60 dBA as the upper boundary of the normally acceptable range for sensitive receptors.

Sacramento County

The Sacramento County General Plan (2007) Noise Element contains policies intended to limit noise levels received by residential and other sensitive receptors. For exterior noise levels, the General Plan sets a CNEL of 60 dBA as the upper boundary of the normally acceptable range for sensitive receptors, as per state guidelines. This includes penalties for evening and nighttime noise.

The Sacramento County Municipal Code states that construction noise is exempt from noise regulations during the weekdays between 6 a.m. and 8 p.m. and during the weekend between 7 a.m. and 8 p.m. (6.68.090 - Exemptions). Exterior noise level standards for construction noise in the Municipal Code (outside of hours in which it is exempt) are consistent with those described in the General Plan. Per the Municipal Code, exterior noise standards are 55 dBA during evening and at 50 dBA during nighttime for sensitive receptors (6.68.70 – Exterior Noise Levels).

Solano County

The Solano County General Plan (2008a) Public Health and Safety Element also includes the state guidelines of a 60 dBA CNEL as the upper boundary of the normally acceptable range for sensitive receptors, as per state guidelines. The noise element and the Solano County Municipal Code do not contain regulations regarding construction noise.

The General Plan Implementation Program includes a plan to develop, adopt, and implement a Solano County noise ordinance that includes the following (Solano County 2008a):

- Performance standards and exemptions
- Restrictions on noise-emitting construction activities based on standards for construction equipment
- Regulations for mobile or single event types of noise emissions or noise generated by added equipment including truck loading and unloading, operation of construction equipment, and amplified music
- Standards to ensure that the County personnel charged with enforcing such an ordinance are properly trained and equipped for on-site measurement techniques and

other necessary tasks
- Standardized, broadly accepted, documented procedures for noise measurement collection to ensure that field measurements are conducted in a consistent manner

Yolo County

The Yolo County General Plan (2009) Health and Safety Element also utilizes the state standard CNEL. The Yolo County Municipal Code and General Plan do not specify regulations on construction noise or times of operation. Title 9 – Parks and Recreation of the Yolo County Municipal Code contains a regulation that prohibits the operation or maintenance of motor vehicles in any manner that causes excessive noise or threatens the public peace, health, and safety (Section 9-3.513(f) – Motor vehicles). This regulation does not set parameters regarding noise levels.

City of Rio Vista

The City of Rio Vista General Plan (2002) Safety and Noise Element contains noise policies intended to limit noise levels received by residential and other sensitive receptors. Section F – Goals, Policies, and Implementing Actions of the General Plan contains a section regarding construction noise. The City's goal is to eventually implement measures intended to minimize the nuisance of construction activity noise emissions. To realize this goal, the City has the following four policies relating to construction noise in place:

- **Policy 11.15.A** requires consistency with the City of Rio Vista Municipal Code Section 17.52.030 – Construction Equipment Noise, which states that construction noise is unlawful within residential zones or within a radius of 500 feet between 7 p.m. and 7 a.m. on weekdays and anytime on Sundays.
- **Policy 11.15.B** states that construction noise is exempt from the non-transportation noise guidelines specified in the General Plan.
- **Policy 11.15.C** requires the City to limit construction activities to between 7 a.m. and 5 p.m. unless an exemption is obtained from the City.
- **Policy 11.15.D** requires mufflers on construction equipment that is powered by internal combustion engines.

City of West Sacramento

The City of West Sacramento General Plan Background Document (2000) and Policy Document (2004) contain noise policies intended to limit noise levels received by residential and other sensitive receptors. These policies rely on the CNEL state guidance. Neither of the General Plan documents or the City of West Sacramento Municipal Code specify regulations regarding construction noise or times of operation. The Port is regulated as M-3 Industrial/Waterfront, which is expected to exhibit higher levels of noise.

3.3.4.1.3 Noise Sources and Receptors

Existing noise sources within the study area include ship and boat engines, whistles, and horns; dredging and sand-mining activities; vehicle traffic on adjacent roadways and bridges; truck and rail operations at the Port; aircraft, including agriculture crop dusters; and other agricultural equipment, including tractors. In some areas, urban noise dominates. Noise-sensitive receptors, as defined in the *State of California General Plan Guidelines* (GOPR 2003) include residential, lodging, schools, libraries, churches, hospitals, nursing homes, auditoriums, concert halls, amphitheaters, playgrounds, and parks. Sensitive receptors for dredging and construction noise were identified using Google Earth (2010), a software program that allows the user to view current aerials and overlay them with information such as the location of churches, hotels, parks, and other places of interest.

Table 63 identifies sensitive receptors within 1,600 feet (0.56 miles) from the shoreline of the SRDWSC or placement sites. It also provides the approximate distance of the receptor from the SRDWSC or placement sites, whichever is closest. Sensitive receptors were not counted twice if located in the vicinity of a placement site and the SRDWSC. If multiple sensitive receptors were located in close proximity to each other (e.g., residences), they were combined to establish one unit, rather than counted individually. Following Table 63 are descriptions of sensitive receptors, by reach, that could be affected by project activities.

Table 63
Summary of Sensitive Receptors in the Study Area Vicinity

Reach	Placement Site or Channel Improvement[1]	Distance (mi)[2]	Direction	Type[3]	Name	RM[4]
5	Channel	0.39	NE	School	Sacramento Entrepreneurship	42.3
5	S1	0.30	S	School	Southport Elementary	42.0
5	S1	0.52	SE	School	Portside Montessori	42.0
5	S1	0.30	S	Church	Church of Jesus Christ Latter Day Saints	42.0
5	S1	0.30	S	Residential	Urban Residential	42.0
5	Channel	0.55	SE	Church	Southport Community Church	41.0
5	S32	0.05	E	Residential	Urban Residential	40.0
5	S31	0.23	E	Residential	Urban Residential	39.0
5	S31	0.16	E	Residential	Rural Residential	38.5
5	S4	0.03	SE	Residential	Rural Residential	38.0
5	S32	0.23	NE	Residential	Rural Residential	37.0
4	S31	0.30	W	Habitat Area	North Central Valley Wildlife Management Area	35.0
4	S32	0.50	E	Residential	Rural Residential	33.0
4	Channel	0.43	E	Residential	Rural Residential	32.5
4	Channel	0.33	E	Residential	Rural Residential	31.5
4	Channel	0.27	E	Residential	Rural Residential	29.3
4	Channel	0.02	E	Residential	Rural	29.0
4	S31	0.23	E	Residential	Rural Residential	29.0
4	S31	0.51	E	Residential	Rural Residential	28.0
4	S31	0.49	E	Residential	Rural Residential	27.5
4	S32	0.30	E	Residential	Rural Residential	26.5
4	S11	0.15	E	Residential	Rural Residential (Daisie)	24.0
4	S11	0.13	E	Mixed-Use	Water-oriented Residential (Five Points)	22.5
3	Channel	0.03	E	Residential	Rural Residential	18.0

Reach	Placement Site or Channel Improvement[1]	Distance (mi)[2]	Direction	Type[3]	Name	RM[4]
3	Channel	0.02	E	Residential	Rural Residential	17.8
3	Channel	0.01	E	Residential	Rural Residential	17.0
3	Channel	0.01	E	Residential	Rural Residential	16.8
3	Channel	0.04	E	Mixed-Use	Water-oriented Residential	16.0
3	Channel	0.02	W	Residential	Rural Residential	15.0
3	S14	0.02	S	Mixed-Use	Water-oriented Residential/Marina	14.5
2	Channel	0.01	W	Residential	Urban Residential	14.0
2	Channel	0.01	E	Park	Cliff House Fishing Access Area	14.0
2	Channel	0.31	W	Church	Calvary Chapel Rio Vista	13.8
2	Channel	0.52	W	School	White Elementary School	13.7
2	Channel	0.52	W	School	River Delta Early Education School	13.7
2	Channel	0.16	W	Lodging	Rio Sands Lodge	13.7
2	Channel	0.13	W	Church	First Congressional Church	13.5
2	Channel	0.23	W	Church	Windborn Church	13.5
2	Channel	0.30	W	Lodging	Sherman Lake Resort	13.5
2	Channel	0.13	W	Church	Lighthouse Ministries Learning	13.0
2	Channel	0.23	W	Park	Bruning Park	13.0
2	Channel	0.30	W	Church	St. Joseph's Catholic Hall	13.0
2	Channel	0.30	W	Cemetery	Rio Vista-Monezuma Cemetery	13.0
2	Channel	0.56	W	Church	Union Baptist Church/Children's Christian Center	13.0
2	Channel	0.32	W	School	River Delta High Elementary	13.0
2	Channel	0.32	W	School	River Delta Unified School District	13.0
2	Channel	0.02	W	Residential	Urban Residential	13.0
2	Channel	0.21	W	School	Riverview Elementary School	12.0
2	Channel	0.33	W	School	Rio Vista High School	12.0
2	Channel	0.01	E	Residential	Rural Residential	12.0
2	S16	0.00	W	Park	Sandy Beach Park	10.0

Reach	Placement Site or Channel Improvement[1]	Distance (mi)[2]	Direction	Type[3]	Name	RM[4]
2	Channel	0.01	E	Residential	Rural Residential	10.0
2	Channel	0.01	E	Park	Brannon Island State Recreational Park	9.5
2	S19	0.11	NE	Residential	Rural Residential	9.0
2	S19	0.10	S	Residential	Rural Residential (Emmaton)	8.0
2	S20	0.00	W	Residential	Rural Residential (appears to be RV Park)	5.0
1	Channel	0.01	W	Park	Sandy Beach Park	4.0
1	Channel	0.20	NE	Mixed-Use	Water-oriented Residential (Collinsville)	0.0

Notes:

Information was gathered from Google Earth (2010) and other aerial imagery

1 Sensitive receptors were not counted twice if located in the vicinity of a placement site and the SRDWSC

2 Reaches 1 through 5 were assessed for sensitive receptors within 1,600 feet (0.56 miles) from the shoreline of the SRDWSC

3 If multiple sensitive receptors were located in close proximity to each other (e.g., residences), they were counted as cluster, rather than counted individually

4 Approximate RM based on an aerial that depicts RMs in 5-mile intervals

Within Reach 1, the closest sensitive receptors are located in Collinsville, north of the SRDWSC, which includes a water-oriented residential area with docks extending into the channel. Although one of the proposed dredged material placement sites, S35, is located in Reach 1 on the north bank of the SRDWSC, the closest private residences are farther than 0.5 mile from both site S35 and the navigation channel. Pittsburg, approximately 1.5 miles south of Reach 1, includes a water-oriented residential area with boat slips and a marina. Noise impacts to Contra Costa County and the City of Pittsburg in the vicinity of Reach 1 were assessed, but no sensitive receptors are located within the study area.

The study area within Reach 2 includes the City of Rio Vista and several proposed dredged material placement sites. Rio Vista residences, parks, schools, and churches are located within the study area west of the SRDWSC. Sherman Island, east of the ship channel, includes Lelia Drive residences, which are located approximately 500 feet from the proposed S20 dredged material placement site and about 2,000 feet from the SRDWSC. The study area also includes River Road residences, which are located within 1,000 feet of the proposed S19 dredged material placement site. In addition, equipment staging and high density drilling would be required to replace PG&E gas pipeline crossings located less than 500 feet from the SRDWSC and within 0.5 mile of the residences on Sherman Island. Equipment staging and high density drilling would be required to replace pipes for existing utilities in the vicinity of the Rio Vista marina. A county park with campground is located within 600 feet of the proposed S16 dredged material placement site. The City of Rio Vista's noise standards require an Ldn of 60 to 65 dB for all sensitive receptors except parks, which have a Ldn standard of 70 dB.

Parks, residences, and businesses are scattered throughout the eastern portion of Reach 3 along State Route (SR) 84. In places, less than 500 feet separate such sensitive receptors from the SRDWSC and S14 on the western tip of Grand Island, including a water-oriented residential area and marina.

Reach 4 is a primarily rural and agricultural area, with sensitive receptors including a marina and a few scattered residences along the banks of the SRDWSC. Five Points, a small rural town at the end of Holland Road, includes several water-oriented homes and a few upland residences and is located approximately 1,000 feet to the east of S11.

In Reach 5, the study area includes the Yolo Bypass Wildlife Area (YBWA) to the west and predominately open space and agricultural fields to the east of the SRDWSC. In addition, several residences are as close as 500 feet to both the SRDWSC and the proposed dredged material placement sites (S11, S31, and S32) that line the banks of the channel. The proposed S1 dredged material placement site is within 1 mile northwest of the Southport Community

Church, and within 0.5 mile from the Jesus Christ of Latter Day Saints Church and Southport Elementary School. Two schools, Sacramento Entrepreneurship and Portside Montessori, lie within 0.5 mile north and south of S1, respectively, in addition to several other sensitive receptors within 2 miles in the City of West Sacramento including residences, schools, churches, and parks. No sensitive receptors were identified near S4.

3.3.4.2 Methodology for Determining Impacts

To determine project compliance with a jurisdiction's noise regulations, the distance at which dredging and construction noise emissions would likely attenuate to regulated exterior noise levels for sensitive receptors was calculated using the Practical Spreading Model. This model is generally used to calculate the distance at which in-air noise spreads from a point source or line source (WSDOT 2010).

To perform these calculations, noise emissions for the proposed channel dredging and the construction of dredged material placement sites were identified based on literature. Noise generated from a typical hydraulic dredge plant is generally between 60 and 80 dBA at 50 feet from the source (USEPA 2004a). The estimated worst-case scenario noise level for the construction equipment proposed for the construction of the sites (at the source) includes dump trucks (76 dBA) and backhoes (78 dBA) for a combined noise of 80 dBA (USDOT 2006). Due to the slow speed of the dredging units and the stationary dredged material placement sites, both sources were considered point and expected to attenuate at a rate of 6 dB per doubling of distance. Minimal traffic noise might occur as a result of truck traffic on major roads for preparation of the proposed dredged material placement sites; it is anticipated that two trucks would be used for preparation of each placement site. For the purposes of this analysis, it is assumed that the background noise levels would be similar to existing conditions.

Table 64 includes calculations according to the Practical Spreading Model. The left-hand column depicts the doubling distance starting at 50 feet from the source and the right-hand columns show noise transmission loss in dBA in terms of attenuation to regulated exterior noise level standards.

Table 64
Typical Dredging and Construction Noise Attenuation

Feet From Source	Dredging or Construction Point Source (Without Penalty, dBA)	Dredging and Construction Point Sources (Without Penalty, dBA)
50	80	83
100	74	77
200	68	68
400	62	62

Feet From Source	Dredging or Construction Point Source (Without Penalty, dBA)	Dredging and Construction Point Sources (Without Penalty, dBA)
800	56	56
1,600	50	53

Based on this information, a noise propagation buffer was calculated and placed over an aerial of the study area to determine noise levels at locations near the SRDWSC and dredged material placement sites. These results were then compared to the local noise regulations to identify possible impacts compared to the significance thresholds.

3.3.4.3 Threshold of Significance

An alternative could have an impact on noise (abbreviated as N in the thresholds and mitigation measures in this section) if it would cause the following:

- **N-1**: Non-compliance with applicable noise regulations demonstrated by exceeding a CNEL of 60 dBA for exterior noise while applying a 5 dB penalty for early evening activities and a 10 db penalty for evening activities, or non-compliance with existing noise conditions in communities near the Port

3.3.4.4 Impacts and Mitigation Measures

N-1: Non-compliance with applicable noise regulations demonstrated by exceeding a CNEL of 60 dBA for exterior noise while applying a 5 dB penalty for early evening activities and a 10 db penalty for evening activities, or non-compliance with existing noise conditions in communities near the Port

Future without Project Conditions (NEPA and CEQA Baseline)

Dredging and dredged material placement activities under Future without Project Conditions would continue to result in temporary, minor impacts due to construction noise. Based on the methodology described in Section 3.3.4.2, residences in close proximity to S20 (the only existing maintenance dredging placement site with residences nearby) would incur noise levels at or below 60 dBA, which is less than significant.

The number of vessels annually calling the Port is anticipated to increase from approximately 58 in 2011 to approximately 143 in 2053 (Ilanco Environmental 2010b), and thus ambient noise at the Port resulting from shipping operations would likely incrementally increase due to the increase in overall ship traffic. Construction or expansion of facilities at the Port that would cause current noise levels to significantly increase are not anticipated (Scheeler 2010a). If such construction or expansion of facilities were undertaken, separate

environmental documentation would be required.

Under Future without Project Conditions, ongoing use of the SRDWSC by vessels, as well as routine maintenance dredging and dredged material placement operations, would continue to result in less than significant impacts due to noise as a result of the expansion of shipping operations.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: The residual impact would be less than significant.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

Potential noise-related impacts from construction of the Proposed Project would include noise due to dredging, placement operations, site preparation, and utility relocation. Construction of the Proposed Project would occur throughout all reaches of the study area and in all ten dredged material placement sites, for approximately 6 months per year over a period of approximately 4 years.

The number of anticipated vessels annually calling the Port is anticipated to reach approximately 100 by 2053, which is less than the anticipated Future without Project Conditions (approximately 143 vessels). Therefore, the Proposed Project would reduce shipping-related noise impacts to nearby communities as compared to baseline conditions.

Sensitive receptors could experience exterior noise levels that exceed local regulatory noise levels on a temporary basis, primarily during the evening, due to the dredging and construction activities under the Proposed Project. Noise impacts to Contra Costa County and the City of Pittsburg in the vicinity of Reach 1 were assessed, but no sensitive receptors are located within the study area; therefore, they were not included in this analysis. A school located south of S1, recreational areas near S14, a park near S16 (due to the utility relocations), and residences near S19 and S32 (due to utility relocations) are also susceptible to noise exceedances and were assessed under this evaluation. Furthermore, within the City of Rio Vista, it is unlawful to emit construction equipment noise within residential zones or within a radius of 500 feet between 7 p.m. and 7 a.m. on weekdays and anytime on Sundays (Rio Vista Municipal Code 17.52.030 – Construction Equipment Noise) without a permit.

Based on the methodology described in Section 3.3.4.2, noise associated with dredging operations alone is anticipated to attenuate to the regulated daytime exterior noise level of 60 dB at approximately 533 feet (0.10 miles) from the source. Evening and nighttime noise associated with dredging operations is anticipated to attenuate to the regulated exterior noise levels of 55 dB and 50 dB at approximately 933 feet (0.18 miles) and 1,600 feet (0.30 miles) from the source, respectively. Construction at dredged material placement sites is

anticipated to attenuate to the regulated daytime exterior noise level at the same distances. When combined, the noise effects are anticipated to attenuate to the regulated levels at 800 feet (0.15 miles) for daytime conditions, 1,600 feet (0.30 miles) during early evening, and 3,200 feet (0.60 miles) during evening.

Construction related noise would be temporary and intermittent, and noise levels would return to baseline levels following construction. Thus, as compared to the environmental baseline, there would be less than significant incremental impacts due to noise as a result of the Proposed Project. The mitigation measures below would be implemented to further reduce noise impacts (refer to Table 20 for complete descriptions of mitigation measures).

Mitigation Measures:

- N-MM-1: Equip construction engines with sound reducing devices
- N-MM-2: Turn off construction equipment when not in use for long periods
- N-MM-3: Require contractor to maintain equipment and train equipment operators to reduce noise levels
- N-MM-4: Locate stationary equipment away from receiving properties
- N-MM-5: Obtain a noise permit from the City of Rio Vista for dredging operations

Residual Impact after Mitigation: After inclusion of the mitigation measures, the residual impact would be less than significant.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

Potential noise related impacts from construction of the -33 Feet MLLW Alternative would include noise due to dredging, placement operations, site preparation, and utility relocation. Construction of this alternative would occur throughout all reaches of the study area and in seven dredged material placement sites, for approximately 6 months per year over a period of approximately 2 to 3 years, ending approximately 2 years prior to the Proposed Project.

Under the -33 Feet MLLW Alternative, the number of anticipated vessels annually calling the Port is anticipated to reach approximately 114 by 2053, which is less than the anticipated Future without Project Conditions (approximately 143 vessels) but greater than the approximately 100 anticipated under the Proposed Project (Ilanco Environmental 2010b). Therefore, similar to the Proposed Project, this alternative would reduce shipping-related noise impacts to nearby communities as compared to baseline conditions.

Impacts due to construction noise would be as described for the Proposed Project, albeit shorter in duration due to the reduced volume of dredging. Construction related noise would be temporary and intermittent, and noise levels would return to baseline levels following construction. Thus, as compared to the environmental baseline, there would be less than significant incremental impacts due to noise as a result of the -33 Feet MLLW

Alternative. The mitigation measures below would be implemented to further reduce noise impacts (refer to Table 20 for complete descriptions of mitigation measures).

Mitigation Measures:

- N-MM-1: Equip construction engines with sound reducing devices
- N-MM-2: Turn off construction equipment when not in use for long periods
- N-MM-3: Require contractor to maintain equipment and train equipment operators to reduce noise levels
- N-MM-4: Locate stationary equipment away from receiving properties
- N-MM-5: Obtain a noise permit from the City of Rio Vista for dredging operations

Residual Impact after Mitigation: After inclusion of the mitigation measures, the residual impact would be less than significant.

3.3.4.4.1 Summary of Impacts and Mitigation Measures

Table 65 summarizes the impact determinations, mitigation measures, and residual impacts after mitigation, if applicable, for each alternative with respect to the noise impacts described above.

Table 65
Summary of Noise Impacts and Mitigation Measures

Alternative	Impact	Mitigation	Residual Impact After Mitigation
N-1: Non-compliance with applicable noise regulations demonstrated by exceeding a CNEL of 60 dBA for exterior noise while applying a 5 dB penalty for early evening activities and a 10 db penalty for evening activities, or non-compliance with existing noise conditions in communities near the Port			
Future without Project Conditions (NEPA and CEQA Baseline)	Less than significant	None	Less than significant
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	Less than significant	N-MM-1, 2, 3, 4, and 5	Less than significant
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	Less than significant	N-MM-1, 2, 3, 4, and 5	Less than significant

3.3.5 Environmental Justice

This section provides baseline information and assesses potential impacts to environmental justice populations from construction of the Proposed Project and alternatives.

3.3.5.1 Baseline Conditions

This section describes the regulatory setting governing environmental justice evaluations and describes the minority and low-income population characteristics of the study area (FR 68 19931 2003). This section also describes Executive Order (EO) 13045, Protection of Children from Environmental Health Risks and Safety Risks, and an evaluation of potential risks.

3.3.5.1.1 Regulatory Setting

Federal and state regulations protecting environmental justice populations are outlined below.

Executive Order 12898

In 1994, President William J. Clinton issued EO 12898, which requires federal agencies to make achieving environmental justice part of their missions by identifying and addressing, as appropriate, disproportionately high adverse human health and environmental effects of agency programs, policies, and activities on minority and low-income populations. The EO emerged in response to growing concerns that minority and/or low-income populations bear an unequal amount of negative health and environmental consequences. In his attached memorandum, President Clinton stated that federal agencies are required to analyze human health, economic, and social effects of federal actions on minority and low-income populations when such analysis is required by NEPA (USEPA 1994).

USEPA is chair of the Interagency Working Group on environmental justice and has the lead responsibility for ensuring compliance with the EO. USEPA (1994) defines environmental justice as "…the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." USEPA defines fair treatment as "…no group of people, including a racial, ethnic, or a socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, or tribal programs and policies." USEPA defines meaningful involvement as "…potentially affected community residents have an appropriate opportunity to participate in decisions about a proposed activity that will affect their environment and/or health; the public's contribution can influence the regulatory agency's decision; the concerns of all participants involved will be considered in the decision-making process; and the decision makers seek out and facilitate the involvement of those potentially affected."

While USEPA has lead responsibility for the EO, the Council on Environmental Quality (CEQ) oversees federal government compliance with the EO and NEPA. CEQ has prepared guidance to assist federal agencies in compliance with the EO in its environmental justice guidance under NEPA (CEQ 1997). Neither the EO nor the CEQ guidance prescribes a specific format for environmental justice assessments in the context of NEPA documents; however, CEQ has identified the following six general principles for federal agencies to stand by, with the intent of integrating environmental justice assessments into NEPA compliance:

- Consider the composition of the affected area to determine whether minority and/or low-income populations or Native American tribes are present in the area affected by

the proposed actions, and if so, whether they could bear disproportionately high and adverse human health or environmental effects.

- Consider relevant and available public health and industrial data concerning the potential for multiple or cumulative exposure to human health or environmental hazards in the affected population.
  - Agencies should consider these effects, even if certain effects are not within the control of or subject to the discretions of the agency proposing the actions.
- Recognize the inter-related cultural, social, occupational, historical, or economic factors that could amplify the natural and physical environmental effects of actions proposed by the agency.
  - These factors should include the physical sensitivity of the community or population to particular impacts, the effects of any disruption on the community structure associated with the proposed action, and the nature and degree of impact on the physical and social structure of the community.
- Develop effective public participation strategies to acknowledge and seek to overcome linguistic, cultural, institutional, geographic, and other barriers to meaningful participation and incorporate active outreach to affected groups.
- Ensure meaningful community representation in the process by being aware of the diverse constituencies within particular populations and encouraging participation to occur as early as possible.
- Seek tribal representation in the process in a manner that is consistent with the government-to-government relationship between the United States and tribal governments.
  - The federal government entrusts responsibility and any treaty rights to federally recognized tribes.

In its guidance, CEQ states that identifying disproportionately high and adverse human health or environmental effects on a low-income or minority population does not preclude a proposed agency action from going forward with a project or compel a finding that a project is environmentally unacceptable. Instead, the identification of such effects is expected to encourage agency consideration of alternatives, mitigation measures, and preferences expressed by the affected populations.

California Public Code Section 71113

On a state level, PRC Section 71113 states that the mission of the California Environmental Protection Agency (CalEPA) includes ensuring that any activities substantially affecting human health or the environment are conducted in a manner guaranteeing the fair treatment of people of all races, cultures, and income levels, including minority and low-income populations. In addition, PRC Sections 71110-711106 require CalEPA to promote

the enforcement of all health and environmental statutes, ensure greater public participation in developing environmental regulations, and improve research and data collection for programs relating to the health and environment of minority and low-income populations, among other things. CalEPA has developed a model environmental justice mission statement and the Interagency Working Group on environmental justice to assist in identifying any policy gaps or obstacles impeding the achievement of environmental justice.

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks

EO 13045, Protection of Children from Environmental Health Risks and Safety Risks, requires federal agencies to prioritize the identification and assessment of environmental health risks and safety risks that may disproportionately affect children and ensure that policies, programs, and standards address disproportionate environmental health or safety risks to children that result from a project (Federal Register Vol. 68, No. 78 2003).

3.3.5.1.2 Environmental Justice Populations in the Study Area

This section describes the existing environmental justice populations in the study area.

Existing Minority and Low-Income Populations

The affected area for environmental justice evaluation purposes was determined in accordance with CEQ guidance for identifying the "affected community" within the study area, which requires consideration of the nature of the likely project impacts and identification of an associated Area of Potential Effect (APE). The majority of environmental impacts are not expected to affect people outside of a 0.5-mile (2,640-foot) radius of dredging locations and dredged material placement sites.

As defined in the EO and the CEQ guidance (1997), minority populations (i.e., Native American or Alaskan Native, Asian or Pacific Islander, Black, or those of Hispanic origin) should be considered to exist in places where either the minority population of the affected area exceeds 50% or the percentage of minority population in the affected area is meaningfully greater than the percentage of minority population in an appropriate geographic reference area. A minority population also exists if more than one minority group is present and the aggregate minority percentage meets one of the above conditions.

The EO does not specifically identify a condition for determining if an affected area is representative of a low-income population. The CEQ guidance specifies that a low-income population is considered to exist if the percentage of low-income persons in an affected area is meaningfully greater than the percentage of low-income persons in an appropriate geographic reference area.

For the purposes of this effort, Census 2000 tract data showing the minority and low-income population percentages in the study area were used as the basis for determining whether minority or low-income populations are present within the APE.

The APE considered in this SEIS/SEIR includes portions of the cities of Collinsville, Rio Vista, Pittsburg, and West Sacramento as well as large expanses of rural or agricultural land in unincorporated Contra Costa, Solano, Sacramento, and Yolo counties. The State of California's Census 2000 data were used as a geographic reference to determine the presence of minority or low-income populations within the APE. Table 66 provides minority and low-income population percentages for both the state and for various census tracts, and relates the study area census data to the state data to determine whether minority or low-income areas exist as defined by the regulations.

Table 66
Minority and Low-income Populations in the Study Area

Geographic Area	Minority Population Percentage	Minority Population?	Low-income Population Percentage[a]	Low-income Population?
State of California[b]	53.3	-	14.2	-
Contra Costa County[c]	42.1	No	7.6	No
City of Pittsburg[d]	68.8	Yes	11.5	No
Southeastern Solano County[e]	23.7	No	10.7	No
City of Rio Vista[f]	17.3	No	10.2	No
Southwestern Sacramento County (Delta Community)[g]	32	No	11.3	No
City of West Sacramento[h]	45.4	No	22.3	Yes
West Sacramento, North of Port[i]	56.9	Yes	32.8	Yes
West Sacramento, South of Port[j]	28.8	No	6.9	No
Yolo County[k]	46.2	No	14.5	No
Yolo County, Northern Reach 4[l]	49.2	No	14.2	No

Notes:

a Low-income population determined from the population percentage living below the poverty level.
b Bay Area Census 2000a
c Bay Area Census 2000b
d Bay Area Census 2000c
e U.S. Census Bureau 2000a
f Bay Area Census 2000d
g U.S. Census Bureau 2000c
h U.S. Census Bureau 2000i
i U.S. Census Bureau 2000k
j U.S. Census Bureau 2000l
k U.S. Census Bureau 2000m

As shown in Table 66, the cities of Pittsburg and West Sacramento census tracts north of the

Port have meaningfully greater percentages of minority populations than the state as a whole; thus, these two areas qualify as minority populations within the APE. In addition, the West Sacramento census tract north of the Port, as well as the entire City of West Sacramento, have low-income population percentages substantially greater than the state as a whole; thus, these two areas also qualify as low-income populations within the APE.

Protection of Children

To assess the number of children within the study area, the number of individuals under the age of 18 for each census tract within the study area was calculated. Table 67 summarizes the analyses and census tracts with a disproportionately high number of children and juveniles.

Table 67
Children and Juvenile Populations in the Study Area

Geographic Area	Children and Juvenile Population Percentage	Disproportionate Population?
State of California[a]	25.5%	-
CT 309000 (Contra Costa County)[b]	21%	No
CT 309000 (Contra Costa County)[b]	24%	No
CT 009700 (Contra Costa County)[b]	29%	Yes
CT 009800 (Sacramento County)[b]	27%	Yes
CT 252702 (Sacramento County)[b]	18%	No
CT 253500 (Solano County)[b]	29%	Yes
CT 253500 (Solano County)[b]	18%	No
CT 253500 (Solano County)[b]	28%	Yes
CT 253500 (Solano County)[b]	26%	Yes
CT 010203 (Solano County)[b]	29%	Yes
CT 010300 (Yolo County)[b]	2%	No
CT 010300 (Yolo County)[b]	23%	No
CT 010400 (Yolo County)[b]	30%	Yes
CT 010400 (Yolo County)[b]	28%	Yes
CT 010506 (Yolo County)[b]	30%	Yes

Sources:
a U.S. Census Bureau 2008a
b U.S. Census 2000o

Low Educational Attainment

The analyses also focused on individuals with low educational attainment levels. Education attainment levels in the vicinity of the study area are shown in Table 68.

Table 68
Educational Attainment

Geographic Area	18-24 Years of Age Without High School Diploma (%)	Over 25 Years of Age Without a High School Diploma (%)	Disproportionate Population?
State of California	18.30	10.6	-
Contra Cost County	15.40	5.90	No
Solano County	20.40	6.50	Yes, 18 to 24
Sacramento County	17.60	7.10	No
Yolo County	6.30	8.10	No

Source: U.S. Census Bureau 2008b

3.3.5.2 Methodology for Determining Impacts

Disproportionately high populations of minorities, disadvantaged (low income and low educational attainment level), and children compared to the State of California averages were identified as described above. During the scoping effort, human health and environmental effects were evaluated to identify which effects might require additional emphasis from an environmental justice perspective; air quality and transportation effects were identified for greater emphasis. The anticipated effects on air quality and transportation were then evaluated to ascertain the potential level of effect.

3.3.5.3 Threshold of Significance

An alternative could have an impact on environmental justice populations (abbreviated as EJ in the thresholds in this section) if it would cause the following:

- **EJ-1**: Disproportionate human health, air quality, noise, or traffic impact on affected populations

3.3.5.4 Impacts and Mitigation Measures

EJ-1: Disproportionate human health, air quality, noise, or traffic impact on affected populations

Future without Project Conditions (NEPA and CEQA Baseline)

Disposal Site S31, which would likely continue to be used for future maintenance dredging, is located within an area with a disproportionally larger minority population than the state population. None of the existing dredged material placement sites that would potentially be used for future maintenance dredging are located within an area of disproportionately high low-income population.

The APE of S16, S19, and S31 contains percentages of individuals aged 18 to 24 years of age

without a high school diploma, which is higher than that of the state. None of the areas surrounding maintenance dredging placement sites have a disproportionately high number of individuals over 24 years of age without a high school diploma.

Although the above-affected populations were identified within the APE, noise due to maintenance dredging and dredged material placement would be short-term and temporary, and conditions would be stabilized upon completion of construction. Noise impacts due to dredging and construction within close proximity to S20 would be at the regulatory limit.

As is discussed in Section 3.3.3, estimated Future without Project Conditions construction (from maintenance dredging and dredged material placement activities) and operational emissions would not exceed thresholds for any criteria pollutant. As such, there would not be a disproportionate air quality impact to environmental justice populations in the APE under Future without Project Conditions.

Any projected increases in off-site impacts (e.g., truck and rail effects on surrounding communities) at the Port due to the growth forecasted to occur under Future without Project Conditions would comply with all relevant rules and regulations governing those modes of transportation. As such, no disproportionate traffic impacts to environmental justice populations living or working in the APE are expected.

Thus, there would be no disproportionate impacts to human health, air quality, noise, or traffic on affected populations living and working in the APE under Future without Project Conditions.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

Many of the Proposed Project's dredged material placement sites are located within areas with a disproportionately high population of minorities or other protected populations. S1 and portions of S31 and S32 are located within areas with a minority population disproportionally higher than the state average. None of the proposed dredged material placement sites are located within an area of disproportionately high low-income population. Sites S11, S14, S19, S16, and S31 contain higher percentages of individuals aged 18 to 24 years of age without a high school diploma than the state average. None of the proposed dredged placement sites have a disproportionately high number of individuals over 24 years of age without a high school degree.

During construction, noise-related impacts would be short-term and temporary, and conditions would be stabilized upon completion of construction. Noise levels for sensitive receptors in close proximity to placement sites would be consistent with Future without Project Conditions.

As is discussed in Section 3.3.3, estimated Proposed Project construction and operational emissions would not exceed thresholds for any criteria pollutant. As such, there would not be a disproportionate air quality impact to environmental justice populations in the APE as a result of the Proposed Project.

The Proposed Project would not involve the construction of any upland elements that would result in changes to traffic or rail patterns at the Port. Traffic conditions under the Proposed Project would be consistent with the Future without Project Conditions, which include growth at the Port.

Thus, as compared to the environmental baseline, there would be no incremental disproportionate impacts to affected populations due to noise, human health, air quality, or traffic related to construction of the Proposed Project.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

As with the Proposed Project, many of the -33 Feet MLLW Alternative's dredged material placement sites are located within areas with a disproportionately high population of minorities or other protected classes. During construction, noise-related impacts would be short-term and temporary, and conditions would be stabilized upon completion of construction. Noise levels for sensitive receptors in close proximity to placement sites would be consistent with Future without Project Conditions.

As is discussed in Section 3.3.3, estimated -33 Feet MLLW Alternative construction and operational emissions would not exceed thresholds for any criteria pollutant. As such, there would not be a disproportionate air quality impact to environmental justice populations in the APE as a result of the -33 Feet MLLW Alternative.

The -33 Feet MLLW Alternative would not involve the construction of any upland elements that would result in changes to traffic or rail patterns at the Port. Traffic conditions would be consistent with the Future without Project Conditions, which include growth at the Port.

Thus, as compared to the environmental baseline, there would there would be no incremental disproportionate impacts to affected populations due to noise, human health, air quality, or traffic impacts related to construction of the -33 MLLW Alternative.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

3.3.5.4.1 Summary of Impacts and Mitigation Measures

Table 69 summarizes impact determinations, mitigation measures, and residual impacts after mitigation, if applicable, for each alternative with respect to the environmental justice impacts described above.

Table 69
Summary of Environmental Justice Impacts and Mitigation Measures

Alternative	Impact	Mitigation	Residual Impact After Mitigation
EJ-1: Disproportionate human health, air quality, noise, or traffic impact on affected populations			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	No impact	None	None
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	No impact	None	None

3.3.6 Utilities

This section discusses existing conditions, impacts, and mitigation measures for proposed utility relocations occurring as part of the Proposed Project or the -33 Feet MLLW Alternative.

3.3.6.1 Baseline Conditions

As is noted in Section 2.2.2.4, the location and depths of existing utility lines that cross the SRDWSC are being confirmed. A summary of utilities documented to date is provided in Appendix G and summarized below. Potential impacts to sensitive resources resulting from utility line relocation activities are discussed in Section 3.2.2.

3.3.6.1.1 Gas Pipelines

As described in Appendix G, the following eight gas pipelines cross the SRDWSC:

- At RM 1.7, an 8-inch gas pipeline, owned by Calpine, crosses the SRDWSC at a depth of 47 feet below the bottom of the existing channel. This crossing was originally identified in the 1986 General Design Memorandum (GDM) as a Dow Chemical facility, but Calpine assumed control of the facility in 1986 (HDR 2010).

- At RM 5.0, a 26-inch PG&E gas pipeline (Line 400) crosses the SRDWSC at a depth of 42 feet MLLW (Thomas 2010a). Additional details on Line 400 are provided in Section 2.2.2.4.
- At RM 6.2, a 42-inch PG&E gas pipeline (Line 401) crosses the SRDWSC at a depth of 50 feet MLLW (Thomas 2010a). Additional details on Line 401 are provided in Section 2.2.2.4.
- At RM 6.5, two 12¾-inch PG&E gas pipelines (Line 114) cross the SRDWSC at a depth of 37 feet MLLW (Thomas 2010a). PG&E has identified Line 114 as a segment for longer-term evaluation and planning due to the potential for ground movement (e.g., proximity of seismically active areas and potential for soil erosion around the pipeline) to affect the pipeline (PG&E 2010). PG&E will relocate Line 114 to ensure it is not affected by other ground movement concerns. Additional details on Line 114 are provided in Section 2.2.2.4.
- At RM 11.0, a 12-inch gas pipeline crosses the SRDWSC at a depth that would not conflict with any of the alternatives being evaluated (the specific depth of this line was not provided in Appendix G; HDR 2010). This pipeline was directionally drilled in 2003.
- At RM 12.5, two ¾-inch high-pressure gas pipelines cross the SRDWSC at a depth of approximately 34 feet MLLW (Thomas 2010a). One pipeline (Line 130) is owned by PG&E and the other is owned by Rosetta Resources. PG&E has identified Line 130 as a segment for longer-term evaluation and planning due to the potential for ground movement (e.g., proximity of seismically active areas and potential for soil erosion around the pipeline) to affect the pipeline (PG&E 2010). PG&E will relocate Line 130 to ensure it is not affected by other ground movement concerns. Additional details on these lines are provided in Section 2.2.2.4.
- At RM 23.4, a PG&E-owned 4-inch gas pipeline (Line 145) crosses the SRDWSC at a depth that would not conflict with any of the alternatives being evaluated (Thomas 2010a). Line 145 may be abandoned and its depth and current status are under investigation.
- At RM 27.8, a Key Production Company-owned 6-inch gas pipeline crosses the SRDWSC at a depth believed to be deeper than 35 feet MLLW (HDR 2010). This pipeline was directionally drilled into place.

3.3.6.1.2 Electric Transmission Lines

As described in Appendix G, the following six electric transmission cables cross the SRDWSC:

- At RM 8.8, an electric transmission cable was identified in the 1986 GDM as crossing the SRDWSC (HDR 2010). The depth, current status, and ownership of this utility line are under investigation.

- At RM 12.7, an electric transmission cable was identified in the 1986 GDM as crossing the SRDWSC 65 feet downstream of the Rio Vista Bridge at an unspecified depth. The depth, current status, and ownership of this utility line are under investigation.
- At RM 12.7, a Caltrans-owned electric transmission cable was identified in the 1986 GDM as crossing the SRDWSC under the Rio Vista Bridge (to provide electricity to the bridge) at a depth of 10 feet below the bottom of the channel (HDR 2010). The depth, current status, and ownership of this utility line are under investigation.
- At RM 12.7, a PG&E-owned electric transmission cable crosses the SRDWSC under the Rio Vista Bridge at a depth of 47 feet MLLW (Thomas 2010a; HDR 2010). Additional details on this crossing are provided in Section 2.2.2.4.
- At RM 12.7, an electric transmission cable was identified in the 1986 GDM as crossing the SRDWSC under the Rio Vista Bridge at an unknown depth (HDR 2010). The depth, current status, and ownership of this utility line are under investigation.
- At RM 12.9, an electric transmission cable was identified in the 1986 GDM as crossing the SRDWSC under the Rio Vista Bridge at an unknown depth (HDR 2010). The depth, current status, and ownership of this utility line are under investigation.

3.3.6.1.3 Other Utility Transmission Lines

As described in Appendix G, the following four other utility lines/structures cross the SRDWSC:

- At RM 1.7, a utility line identified in the 1986 GDM as a General Telephone facility crosses the SRDWSC. The USACE and the Port are currently further investigating the depth, current status, and ownership of this utility line.
- At RM 10.0, a utility line owned by Chevron was identified in the 1986 GDM as crossing the SRDWSC. The USACE and the Port are currently further investigating the depth, current status, and ownership of this utility line.
- At RM 12.7, a utility line identified in the 1986 GDM as a Delta T&T, formerly General Telephone, facility crosses the SRDWSC. The USACE and the Port are currently further investigating the depth, current status, and ownership of this utility line.
- At RM 13.0, an outfall structure along the SRDWSC was identified in the 1986 GDM. The USACE and the Port are currently further investigating the depth, current status, and ownership of this structure.

PG&E will be required to replace utility lines that conflict with the Proposed Project or the -33 Feet MLLW Alternative. The construction access areas for the utility lines that have been identified to date as requiring replacement (Lines 114 and 130, further discussed in Section 2.2.2.4) are currently under agricultural use.

3.3.6.2 Methodology for Determining Impacts

Impacts to utilities were evaluated based on the potential for the various alternatives to temporarily or permanently limit, alter, or result in the loss of utility service in the area.

3.3.6.3 Thresholds of Significance

An alternative could have an impact on utilities (abbreviated as U in the thresholds in this section) if it would cause the following:

- U-1: Substantial adverse impacts to existing water supply, wastewater, landfill capacities, energy supply, or distribution infrastructure
- U-2: Potential for utility relocation-related action taken in an area with known HTRW sites to cause release and potential movement of HTRW

3.3.6.4 Impacts and Mitigation Measures

U-1: Substantial adverse impacts to existing water supply, wastewater, landfill capacities, energy supply, or distribution infrastructure

Future without Project Conditions (NEPA and CEQA Baseline)

Under Future without Project Conditions, deepening and widening of the SRDWSC would not occur. The ongoing use of the SRDWSC by commercial vessels accessing the Port and routine maintenance dredging activities would not result in adverse impacts to the existing water supply, wastewater, landfill capacities, energy supply, or distribution infrastructure. Thus, there would be no impacts to the use, quality, and availability of the existing water supply, wastewater, landfill capacities, energy supply, or distribution infrastructure under Future without Project Conditions.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

Under the Proposed Project, construction dredging operations, dredged material placement activities, and utility relocation are not likely to result in impacts to water supply, wastewater, or landfill capacities. At least two gas pipelines (Lines 114 and 130) would be in conflict with the -35 feet MLLW depth and require replacement. It is possible that Line 400 could also require replacement. PG&E does not anticipate any service impacts to customers from utility replacement activities under the Proposed Project (Thomas 2010b). Thus, as compared to the environmental baseline, there would be no impacts to the existing water supply, wastewater, landfill capacities, energy supply, or distribution infrastructure as a result of the Proposed Project.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

Under the -33 Feet MLLW Alternative, impacts to existing water supply, wastewater, landfill capacities, energy supply, or distribution infrastructure would be consistent with those of the Proposed Project. Thus, as compared to the environmental baseline, there would be no impacts to the existing water supply, wastewater, landfill capacities, energy supply, or distribution infrastructure as a result of the -33 Feet MLLW Alternative.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

U-2: Potential for utility relocation-related action taken in an area with known HTRW sites to cause release and potential movement of HTRW

Future without Project Conditions (NEPA and CEQA Baseline)

Under Future without Project Conditions, there would not be a need for utility relocation-related action. Thus, there would be no impacts from HTRW release and movement from utility relocation-related actions under Future without Project Conditions.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

Utility replacement/removal and upland construction access areas under the Proposed Project would not overlap with known HTRW sites (see Section 3.3.11 for HTRW site locations). Thus, as compared to the environmental baseline, there would be no impacts to known HTRW sites from utility relocation activities as a result of the Proposed Project.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

As with the Proposed Project, utility replacement/removal and upland construction access areas under the -33 Feet MLLW Alternative would not overlap with known HTRW sites. Thus, as compared to the environmental baseline, there would be no impacts to known HTRW sites from utility relocation activities as a result of the -33 Feet MLLW Alternative.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

3.3.6.4.1 Summary of Impacts and Mitigation Measures

Table 70 summarizes the impact determinations, mitigation measures, and residual impacts

after mitigation, if applicable, for each alternative with respect to the utilities impacts described above.

Table 70
Summary of Utilities Impacts and Mitigation Measures

Alternative	Impact	Mitigation	Residual Impact After Mitigation
U-1: Substantial adverse impacts to existing water supply, wastewater, landfill capacities, energy supply, or distribution infrastructure			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	No impact	None	None
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	No impact	None	None
U-2: Potential for utility relocation-related action taken in an area with known HTRW sites to cause release and potential movement of HTRW			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	No impact	None	None
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	No impact	None	None

3.3.7 Cultural and Historic Resources

This section discusses existing conditions, regulatory setting, and evaluation of potential impacts to cultural and historic resources.

3.3.7.1 Baseline Conditions

This section summarizes the cultural and historic resources that are located within the study area.

3.3.7.1.1 Regulatory Setting

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the potential effects on significant cultural resources from a proposed undertaking and give the State Historic Preservation Officer (SHPO) an opportunity to comment. The Section 106 implementing regulations are codified at 36 CFR Part 800, which describe the consultation process between the SHPO and the agency, Native American tribes, and interested parties. In addition, there are provisions to involve the Advisory Council on Historic Preservation, which is the agency that advises the Executive Branch of the government on historic preservation matters. In accordance with 36 CFR 800.4, a "good

faith effort" was made to identify cultural resources situated in the study area and to evaluate them for their eligibility for listing in the National Register of Historic Places (NRHP). The findings regarding the presence or absence of such cultural resources under the Section 106 process are also required to comply with the NEPA and CEQA. When human burials are encountered in federal projects, the tribal consultation must include the provisions of the California Public Resources Code (PRC).

Federal agencies follow several prominent steps as described in 36 CFR Part 800:

(a) Initiating consultation with the SHPO, Native American tribes, and interested parties
(b) Determining the APE (defined in Section 3.3.7.1.2)
(c) Conducting appropriate studies to determine whether cultural resources are present in the APE, and if so
(d) Assessing whether any identified resources meet the eligibility criteria for listing in the NRHP, and if so
(e) Determining whether the Proposed Project would have adverse effects on eligible properties, and if so
(f) Developing a Treatment Plan to resolve the adverse effects
(g) Executing a Memorandum of Agreement with the SHPO and other consulting parties

Step (d) is critical in the Section 106 process, because only those properties listed in the NRHP (i.e., formally nominated and approved by the National Park Service) and those newly identified cultural resources that are determined jointly by the federal agency and the SHPO (and occasionally Native American tribes) to meet the eligibility requirements must be assessed for potential effects and mitigation measures, if needed. This collaborative process to identify cultural resources that meet the NRHP criteria is referred to as a "consensus-based determination of eligibility." In federal terminology, a determined-eligible cultural resource is referred to as an "historic property." Adverse effects to historic properties can be resolved through provisions of a Memorandum of Agreement, or a Programmatic Agreement for complex and phased projects, usually executed between the federal agency and the SHPO. Other consulting parties may participate in agreement documents.

A property may be listed, or determined eligible for listing in, the NRHP if it meets criteria for evaluation defined in 36 CFR 60.4. That is, the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

(a) That are associated with events that have made a significant contribution to the broad patterns of our history, or
(b) That are associated with the lives of persons significant in our past, or

(c) That embody the distinctive characteristics of a type, period or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, or
(d) That have yielded, or may be likely to yield, information important in prehistory or history

The State of California regulations for the protection of cultural resources are similar to the federal historic preservation program. State procedures are codified in Appendix K of CEQA, which requires that only significant cultural resources need to be addressed and mitigated. Significant resources are referred to as "historical resources" or "unique archaeological resources." CEQA guidelines define a "historical resource" as, among other things, "a resource listed or eligible for listing in the California Register of Historical Resources (California Register)." An historical resource may be eligible for inclusion on the California Register, as determined by the State Historical Resources Commission or the lead agency, if the resource:

(a) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage, or
(b) Is associated with the lives of persons important in our past, or
(c) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values, or
(d) Has yielded, or may be likely to yield, information important in prehistory or history

Properties that are eligible for the NRHP are automatically eligible for the California Register. Properties that do not meet the threshold for the NRHP may still meet the California Register criteria.

In addition, Section 21083.2 of the CEQA guidelines require consideration of unique archaeological sites. A unique archaeological resource is "an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

(a) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information,
(b) Has a special and particular quality such as being the oldest of its type or the best available example of its type, or
(c) Is directly associated with a scientifically recognized important prehistoric or historic event or person."

If an archaeological site does not meet the criteria for inclusion on the California Register but does meet the definition of a unique archaeological resource as outlined in the PRC, it is entitled to special protection or attention under CEQA. Treatment options under CEQA include activities that preserve such resources in place in an undisturbed state. Other acceptable methods of mitigation are excavation and curation, or study in place without excavation and curation.

3.3.7.1.2 Area of Potential Effects

The APE was defined in accordance with the following definition in 36 CFR Part 800.16: the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking."

The APE, as currently delineated for the Proposed Project, includes aquatic and terrestrial areas. The principal aquatic component consists of the submerged sediments on the slopes and bottom of the SRDWSC that will be dredged to achieve the design width and depth. The terrestrial element consists of the proposed dredged material placement sites, as well as associated dredge pipeline routes and utility construction access areas. The USACE will consider views of the SHPO regarding the currently proposed APE.

3.3.7.1.3 Historic Properties

The USACE has conducted a variety of cultural resource studies related to the SRDWSC over the past 35 years. Although no cultural resource work was conducted when the SRDWSC was originally constructed (from 1949 to 1963), in the late 1970s, archaeologists associated with the California State University, Sacramento surveyed the following sites:

(a) A series of proposed dredged material placement sites adjacent to the SRDWSC between Collinsville and West Sacramento
(b) A randomly selected group of nine 0.5-mile-long sections of the bank of the SRDWSC throughout a 32-mile stretch
(c) A 3.5-mile section of the SRDWSC along Cache Slough where the natural channel survived

In the mid-1980s, in support of deepening the SRDWSC to a depth of 35 feet MLLW, consulting archaeologists under contract with USACE Sacramento District surveyed an additional 11 dredged material placement sites and portions of Port property totaling approximately 3,100 acres. The USACE Sacramento District consulted with the SHPO in 1985 and received concurrence that no historic properties would be affected by the Proposed Project implementation.

Since then, USACE Sacramento District has periodically conducted records searches at the regional offices of the California Historical Resources Information System (CHRIS). While the basic design of the Proposed Project has remained unchanged, new proposed dredged material placement sites were added since the 1980s. In 2010, USACE San Francisco District conducted a records search for, and completed an archaeological reconnaissance of, the new sites that are now part of the APE. The USACE also visited several of the previously surveyed dredged material placement sites and approximately 2.0 miles of levees along selected sections of the SRDWSC. In addition to terrestrial historical resources and prehistoric sites, USACE made an initial assessment of the potential for submerged cultural resources to exist in the study area. In 2008, USACE accessed the California State Lands Commission database of reported vessels that sank, or were otherwise lost, along the Pacific Ocean coast, in San Francisco Bay and in the Delta. The database provides latitude and longitude coordinates for each potential wreck location, which serve as an approximation of the location where the vessel came to rest.

The SRDWSC, as an engineered navigation channel, is considered by USACE to be a historic resource that should be recorded in the State's historical resources information system. The SRDWSC, completed in 1963, does not currently meet the minimum age requirement (50 years) for consideration under the NRHP. It will, however, meet the age criteria in the near future, before construction of the Proposed Project would be completed. Thus, it is reasonable to start collecting data about the SRDWSC and record the resource in the State's filing system in anticipation that there may be a formal evaluation of its eligibility for listing in the NRHP.

Under the California Register program, the minimum age for recording a historic resource in the State's database is 45 years old. Thus, the SRDWSC should, at a minimum, be recorded as a California Register historic resource. However, before the SRDWSC can be listed or found eligible for listing in the California Register, or otherwise determined to be significant at the local, state, or federal level, more restrictive criteria must be met as described above in Section 3.3.7.1.1.

Regardless of which register criterion is applied, the significance of the SRDWSC most likely may be found in its contribution to the broad patterns of California and the nation's history and cultural heritage. The historical themes for the SRDWSC could include maritime transportation and commerce, economics, and engineering. Completion of the SRDWSC played an important role in the movement of cargo and products from the agricultural and industrial sectors of the Sacramento Valley to the San Francisco Bay area. The SRDWSC was deepened during earlier dredging projects, thus accommodating modern deep-draft vessels and allowing them to dock at the Port. Due to construction of the manmade portion of the

SRDWSC, the transportation route to the Port was shortened from about 59 miles to approximately 44 miles.

The research and archaeological surveys conducted by USACE and its contractors revealed several archaeological resources and historical sites on the Sacramento River, on and near the river's levees, and in and adjacent to proposed dredged material placement sites; however, these resources are not located within the currently proposed APE. The resources include prehistoric sites, levees, a ranch complex, abandoned buildings, a segment of a slough, earthen ditches, a cluster of farm equipment, and a remnant railroad grade. Because none of the identified resources or sites is situated within the currently proposed APE, USACE is not planning to determine whether these resources meet the eligibility criteria of the NRHP or the California Register. The USACE will request comment from the SHPO on these determinations, and if concurrence is received, USACE would conclude that there are no historic properties affected by the Proposed Project.

The previous terrestrial archaeological studies have resulted in observations about the extensive land alterations and the potential for cultural resources to have survived in the APE. Coupled with published historical accounts, it is clear that the land along the main-stem Sacramento River was heavily disturbed by the original construction of the SRDWSC and regular maintenance dredging activities, the creation and use of dredged material placement sites, and construction of other maritime facilities. Land excavation and fill have sometimes extended hundreds of feet inland from the banks of the main-stem Sacramento River. In addition, settlement and agricultural use of many of the Delta islands has occurred for more than 100 years. Thus, cultural resources were destroyed, severely damaged, or otherwise masked from identification by archaeologists during ground surface surveys.

Prehistoric Cultural Resources

This section describes the prehistoric cultural resources identified in the study area.

Archaeological Site P-57-000045 – This archaeological resource is situated in the southwestern portion of the proposed dredged material placement site S1. S1 was used previously to store dredged material; however, the portion of the site where archaeological materials were recorded has not been used for placement. The proposed usable portion of S1 does not include the southwestern area. Thus, the archaeological site is situated outside the placement site APE.

This site was initially recorded by Sacramento State College in 1960 as a "mounded" feature approximately 5 feet high and covering more than 1 acre. In 1976, the site was observed during an archaeological survey of potential dredged material placement sites for USACE.

The elevated ground surface was noted and a surface scatter of artifacts recorded, including fragmentary hunting and grinding tools, a piece of shaped stone, fire-affected rock, and a baked-clay object. The site was revisited in 1985 by a USACE contractor and in 2009 by a USACE San Francisco District archaeologist. In both cases, fragmentary rock and tools were observed on the ground surface, but soil mounding was not observed, and there was very little difference between the soils onsite and in surrounding areas.

Archaeological Site P-48-000117 – This resource is situated on the west bank of the main-stem Sacramento River, near the Ryer Island Ferry terminal. It is approximately 100 feet from the boundary of the SRDWSC and, therefore, outside the APE. The site was recorded in 1966 by California State University, Hayward, as an extensive deposit of obsidian tools and flakes, stone-grinding implements, bone tools, and shell ornaments imbedded in the constructed levee immediately downstream of the ferry terminal. Human burials were also documented. Revisited in 1980, many of the site's archaeological constituents were still present. The USACE field studies included a visit to this site in 2009, when only fragmentary shell and fire-affected rock were noted in the levee matrix.

Two isolated prehistoric archaeological specimens were identified in separate parts of the study area: an obsidian artifact and a clay/earthen fragment. These materials are not considered archaeological sites; rather, they are evidence of the general use of the area by Native American groups.

3.3.7.4.2 Historical Cultural Resources

This section describes the historic cultural resources identified in the study area.

Historical Site P-48-000787 – This resource is the levee system, roughly 10 miles long, that encircles Prospect Island. The levee widths vary from 15 feet (on Miner Slough) to 25 feet (on the main-stem Sacramento River). A 0.5-mile-long cross-levee traverses the island east-to-west, and is about 13 feet wide and armored with stone. The levee system, dating to approximately the 1910s to 1920s, is owned by the Department of Water Resources (DWR) and the Port. Dredged material would not be placed on Prospect Island; however, Prospect Island is proposed for wetland mitigation (i.e., preservation). Because the historical character of the levees would remain unchanged from wetland preservation, this site is not included within the APE.

Historical Site P-34-002143 – This resource is four linear sections of levee situated on the eastern and western banks of the main-stem Sacramento River between Sherman Island (to the south) and Freeport (to the north). The levees support parts of several state highways along Sherman Island, Brannan Island, Grand Island, and Randall Island. The levee sections

have steeply sloped banks on both sides, with a flat top almost completed covered by the state highway, and they support riparian vegetation. The construction dates are different for the sections; however, they are all considered to be "project levees" associated with the Sacramento River Flood Control Plan authorized in 1917, which were periodically rebuilt and improved to "project standards." The flood control levees were preceded by earthen levees construction in the late 1800s by local reclamation districts and landowners. None of the sections are within the APE because the levees would not be altered by any of the alternatives.

Historical Site P-48-000417 – This resource site is located in the eastern portion of Prospect Island approximately 1.7 miles south of the Five Points Marina, and, therefore, outside the APE. The site has two abandoned dwellings, one two-story bunkhouse, several associated outbuildings, a pump house, a possible wash/bath house, and remnants of a small collapsed building and corrugated metal roof. All of the buildings are elevated above the floodplain. The buildings are wood construction; one house has a shingled roof and the others have corrugated metal roofs. They vary in size from 24 by 24 feet to 18 by 36 feet.

Historical site P-57-000187 – Located at Toland Landing, which is outside the APE, this is a historic ranching complex consisting of residential buildings, a barn, a garage/equipment shed, small storage sheds, a water tower, a wood-frame foundation, a privy shaft, pits, and other possible foundation remnants. The architectural features indicate multiple construction periods, with at least one dwelling possibly from the pre-1900 era. In addition, scattered household and architectural materials (i.e., ceramic shards, porcelain insulators, colored bottle glass, butchered bone fragments, bricks, wire-cut nails, and window glass) are associated with this site.

Sacramento Northern Railroad – A previously unrecorded historical site was recorded near Arcade. It was described as the remains of the Old Sacramento Northern Railroad grade, consisting of a wooden piling and a dirt berm. Additional associated railroad features are situated west of the SRDWSC in the Yolo Bypass. The Arcade location is on the bank of the SRDWSC near the proposed dredged placement site S31, but outside the APE.

Submerged Cultural Resources – A query of reported shipwrecks for Sacramento, Solano, and Yolo counties revealed nearly 40 reported locations where vessels foundered, exploded, burned, collided, stranded, or were snagged, presumably along the Sacramento River and major sloughs. The vessel types included side-wheel steamboats, steamships, brigs, schooners, some dating to the mid- and late 1800s, others from the early 1900s, and even one bucket dredge, the *Neptune,* that sank on the river in 1980.

The coordinates of the 40 vessels were calculated and the locations mapped with MapQuest online, resulting in three shipwrecks that appear situated along the Sacramento River in the vicinity of the current project area: 1) the *Goliah,* a sailing schooner lost upstream of Rio Vista; 2) the *Grace Barton*, a sternwheel steamboat built in 1890 and burned in 1916 near North Liberty Island; and 3) the *Alert*, a sidewheel steamboat, built in 1885 and foundered in 1888, also near Liberty Slough.

There is limited information about known shipwrecks in the project area and other lost vessels and associated artifacts may exist along the river. Nonetheless, it is reasonable to suggest that submerged wreck remnants will not be found in the parts of the maintained ship channel, and likewise in the channel banks to be widened. The SHPO will have an opportunity to comment on this aspect of the effort to identify submerged cultural resources.

Additional Historical Sites and Landscape Features – Other maritime features such as remnants of piers, ferry landings, and bank protections along the main-stem Sacramento River upstream of the study area, were recorded as historical sites. The USACE surveys noted an absence of such landscape features along the shoreline and banks of the main-stem Sacramento River in the southern part of the study area.

Natural features such as sloughs and groves of valley oak (*Quercus lobata*) were recorded as historical sites in the vicinity of the study area. Elk Slough, which is approximately 6 miles long, is located near Clarksburg on the main-stem Sacramento River. Elk Slough was slightly altered from its original meandering shape, with its banks still vegetated and undeveloped. It served as one of the main water routes in Yolo County during the 1850s when settlers traveled through the Delta into the Sacramento Valley. Cache Slough, located closer to the study area, exhibits similar qualities. Yolo County also has more than 40 locations of valley oak groves and groves of mixed valley oak and riparian vegetation identified as historical resources. Similar landscape features were identified on Twitchell Island's levee and on Brannan Island.

Table 71 summarizes the cultural and historic resources findings at the ten dredged material placement sites evaluated in this Draft SEIS/SEIR.

Table 71
Summary of Cultural Resources Information at Proposed Dredged Material Placement Sites

Site Number	River Mile Location	Archaeological Coverage	Cultural Resources
S1[a]	RMs 42.0 to 43.5	158 acres surveyed	Archaeological site present in part of placement site not to be used
S4[a]	RMs 38.0 to 38.5	137 acres surveyed	None

Site Number	River Mile Location	Archaeological Coverage	Cultural Resources
S11 [a]	RMs 22.4 to 25.0	463 acres surveyed	None
S14 [b]	RMs 14.4 to 14.6	196 acres surveyed	None
S16 [b]	RMs 9.5 to 11.0	198 acres surveyed	None
S19 [b]	RMs 6.9 to 8.5	450 acres surveyed	None
S20 [b]	RMs 5.0 to 5.5	98 acres surveyed	None
S31 [a]	RMs 26.6 to 40.4	663 acres surveyed	Railroad grade remnants nearby
S32 [a]	RMs 31.6 to 35.2	265 acres surveyed	None
S35 [a]	RMs 2.0 to 3.1	335 acres surveyed	None

Notes:

a Werner 1985

b Seldomridge and Seldomridge 1976

3.3.7.2 Methodology for Determining Impacts

The methodology used to determine whether the APE contains historic properties and historical resources meets the identification criteria in 36 CFR 800.4. It is possible that focused field surveys and assessments of selected cultural resources, as well as geophysical studies of specific submerged land, could be undertaken in the future. In August 2010, USACE received a list of appropriate Native American tribes from the California Native American Heritage Commission. The USACE will invite the listed tribes to comment regarding the identified archaeological resources and sites that have religious or cultural significance for Native Americans. Tribal representatives may become consulting parties or, at a minimum, will be asked to participate as concurring parties.

Future field surveys or geophysical work will meet federal standards, and the approach and scope of the work will be coordinated with the SHPO before being conducted. The field surveys could follow guidelines for Phase 1 reconnaissance, and if cultural resources are found within the APE, Phase 2 testing could be implemented to determine NRHP eligibility. The reconnaissance effort typically consists of a pedestrian survey where surface visibility is good, and includes shovel- and auger-probes carried out to assess the horizontal and vertical extent of the resource, as needed. A technical report would be prepared, which would meet the federal and SHPO standards and include evaluations of NRHP eligibility, assessment of the undertaking's effects, and measures considered to avoid adverse effects.

3.3.7.3 Threshold of Significance

An alternative could have an impact on cultural and historic resources (abbreviated as CR in the thresholds in this section) if it would cause the following:

- CHR-1: Adverse impact (i.e., disturbance, neglect, damage, degradation, demolition, conversion, relocation, reduction in integrity, or character change) to a cultural resource during project-related construction

3.3.7.4 Impacts and Mitigation Measures

CHR-1: Adverse impact (i.e., disturbance, neglect, damage, degradation, demolition, conversion, relocation, reduction in integrity, or character change) to a cultural resource during project-related construction

Future without Project Conditions (NEPA and CEQA Baseline)

There are no archaeological resources or historical sites within the proposed APE that would be impacted under Future without Project Conditions. Although archaeological site P-57-000045 is located on S1 (which was used in the past for maintenance dredging), the areas that were used for placement are northeast of the location of the archaeological materials. The dredge pipeline could traverse the Sherman Island levee that is part of the historical site P-34-002143; however, the levee will not be altered by the pipeline placement. Thus, there would be no impacts to cultural and historic resources under Future without Project Conditions.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

There are no archaeological resources or historical sites within the proposed APE that would be impacted under the Proposed Project. Although archaeological site P-57-000045 is located on S1, it is not included in the APE because the usable portion of the site is northeast of the location of the archaeological materials. The dredge pipeline could traverse the Sherman Island levee that is part of the historical site P-34-002143 en route to S20; however, the levee would not be altered by the pipeline placement. Thus, as compared to the environmental baseline, there would be no impacts to cultural and historic resources as a result of the Proposed Project. The following mitigation measure would be implemented as a contingency to further reduce the potential for impacts to cultural and historic resources (refer to Table 20 for a complete description of the mitigation measure).

Mitigation Measures:

- CHR-MM-1: Develop and plan and conduct onsite archaeological monitoring during construction

Residual Impact after Mitigation: There would be no residual impacts.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

The impacts of the -33 Feet MLLW Alternative on cultural resources would be consistent with those of the Proposed Project. Thus, as compared to the environmental baseline, there would be no impacts to cultural and historic resources as a result of the -33 Feet MLLW Alternative. The following mitigation measure would be implemented as a contingency to

further reduce the potential for impacts to cultural and historic resources (refer to Table 20 for a complete description of the mitigation measure).

Mitigation Measures:

- CHR-MM-1: Develop and plan and conduct onsite archaeological monitoring during construction

Residual Impact after Mitigation: There would be no residual impacts.

3.3.7.4.1 Summary of Impacts and Mitigation Measures

Table 72 summarizes the impact determinations, mitigation measures, and residual impacts after mitigation, if applicable, for each alternative with respect to the cultural and historic resources impacts described above.

Table 72
Summary of Cultural and Historic Resources Impacts and Mitigation Measures

Alternative	Impact	Mitigation	Residual Impact After Mitigation
CHR-1: Adverse impact (i.e., disturbance, neglect, damage, degradation, demolition, conversion, relocation, reduction in integrity, or character change) to a cultural resource during project-related construction			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	No impact	CHR-MM-1	None
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	No impact	CHR-MM-1	None

3.3.8 Recreational Resources

This section provides baseline conditions and assesses potential impacts to recreational resources from the Proposed Project and alternatives.

3.3.8.1 Baseline Conditions

This section summarizes the recreational resources (activities and services) that currently occur within the study area. For the purposes of this SEIS/SEIR, recreational resources are generally defined as boating, fishing, swimming, and other water-oriented activities. The subject of recreational resources is important to several agencies working in the region of the Sacramento and San Joaquin rivers and the Delta. For the past 30 years, the DWR, CDBW, Sacramento-Yolo Port District, the City of West Sacramento, and USACE have addressed recreational opportunities within the study area. The City of West Sacramento has a goal to provide public access to the SRDWSC for recreational purposes, and objectives to link the navigation channel to the overall parks system and to encourage new public and private marinas.

In the 1980 EIS, recreation was reported as an authorized project purpose, but because a cost-sharing agreement was not negotiated with the potential non-federal sponsors, the recreation component had to be deferred. That EIS determined that none of the current recreation facilities would be affected by project implementation and that "casual recreation" along the banks of the SRDWSC would only be temporarily impacted during removal of riparian vegetation.

A relatively recent action indicative of the federal interest in recreation on public land in northern California was the introduction of H.R. 6413 in the House of Representatives in 2006, which aimed to establish the Sacramento River National Recreation Area. Although the bill targeted public lands in Tehama and Shasta counties managed by the Bureau of Land Management, the intent of the legislation (i.e., enhancing recreational opportunities) appears to have become a major interest for Sacramento County government and other parties in and around the Delta.

The SRDWSC is a popular recreation destination, attracting visitors who enjoy an assortment of water activities (both body-contact and non-contact) and other users who make the terrestrial environment their focus (shoreline trails and inland areas connected by trails). Recreational activities that are known to exist within the study area include motorized and non-motorized boating, kayaking, hunting, fishing, hiking, swimming, rafting, jet skiing, kite boarding, camping, horseback riding, mountain biking, geocaching, marksmanship, archery, picnicking, wildlife viewing, and photography.

Several small commercial cruise lines and charter yachts offer Delta tours and private cruises at various locations in and near the study area. Many of these commercial cruises would pass through the study area; however, they are typically based outside of the study area in either Sacramento or Stockton. In the past, commercial cruise services were offered through the study area, from San Francisco to Sacramento.

The SRDWSC is also home to a thriving recreational fishing industry. The most significant recreational fisheries in the study area are listed in Table 73. More than 10 recreational fishing guide companies and tackle shops support the study area's recreational fisheries. The city of Rio Vista hosts an annual bass fishing festival, which typically attracts upwards of 40,000 attendees.

Table 73
Recreational Fisheries in the Study Area

Common Name	Scientific Name
American shad	*Alosa sapidissima*
Largemouth bass	*Micropterus salmoides*
Smallmouth bass	*Micropterus dolomieui*
Bluegill	*Lepomis macrochirus*
Black crappie	*Pomoxis nigromaculatus*
White crappie	*Pomoxis annularis*
Bullhead catfish	*Ictalurus nebulosus*
Channel catfish	*Ictalurus punctatus*
White catfish	*Ictalaurus catus*
White sturgeon	*Acipenser transmontanus*
Striped bass	*Morone saxatilis*
Spotted bass	*Micropterus punctulatus*
Crayfish	*Pacifastacus leniusculus*
Steelhead	*Oncorhynchus mykiss*
Coho salmon	*Oncorhynchus kisutch*
Chinook salmon[a]	*Oncorhynchus tshawytscha*

Notes:

a While there have been Chinook salmon sport fisheries, the commercial fishery for Chinook salmon was closed for the past two seasons, and it remains unknown as to whether a sport fishery would exist in the future.

Source:

California Department of Fish and Game. 2009. California Natural Diversity Database – Special Animals (901 taxa). http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPAnimals.pdf Accessed March 15, 2009.

Visitors can travel and access the SRDWSC via boat, and recreational boaters are served by private and public marinas and launching facilities. However, boat launches are not readily available in all parts of the study area, which is one of the main limitations to boating. Shoreline access points for fishing are sparse in the study area as well. Boat launches and fishing access points are often co-located. There has been some growth in the development of such facilities, and it can be expected that the demand would continue to increase, which would translate into larger numbers of recreational boaters.

A number of private and public marinas are located within the study area. Table 74 describes these marinas and Figure 35 shows the locations of marinas and harbors within the study area.

Table 74
Marinas Located in the Study Area

Marina Name	Reach	City	Private or Public	Other Features
McAvoy Yacht Harbor	1	West of Pittsburg	Private	Boat launch 6-foot average depth [a]
Pittsburg Municipal Marina	1	Pittsburg	Public	Boat launch 7.5-foot average depth [b]
Antioch Marina	1	Antioch	Public	Boat launch 10-foot average depth [c]
Sherman Lake Resort	2	Sherman Island	Private	Boat launch 4-foot average depth
Outrigger Marina	2	Sherman Island	Private	20-foot average depth
Brannan Island State Recreation Area	2	Brannan Island	Public	Boat launch
Windy Cove State Park	2	South of Rio Vista	Public	Boat launch [d]
Sandy Beach Regional County Park	2	South of Rio Vista	Public	Boat launch
Delta Marina Yacht Harbor	2	Rio Vista	Private	Boat launch 8-foot average depth [d]
Hidden Harbor	3	Ryer Island	Private	Sailboats only 5-foot average depth

Sources:

a SacDelta 2009
b Pittsburg Marina 2009
c City of Antioch 2009
d BoatHarbors 2009

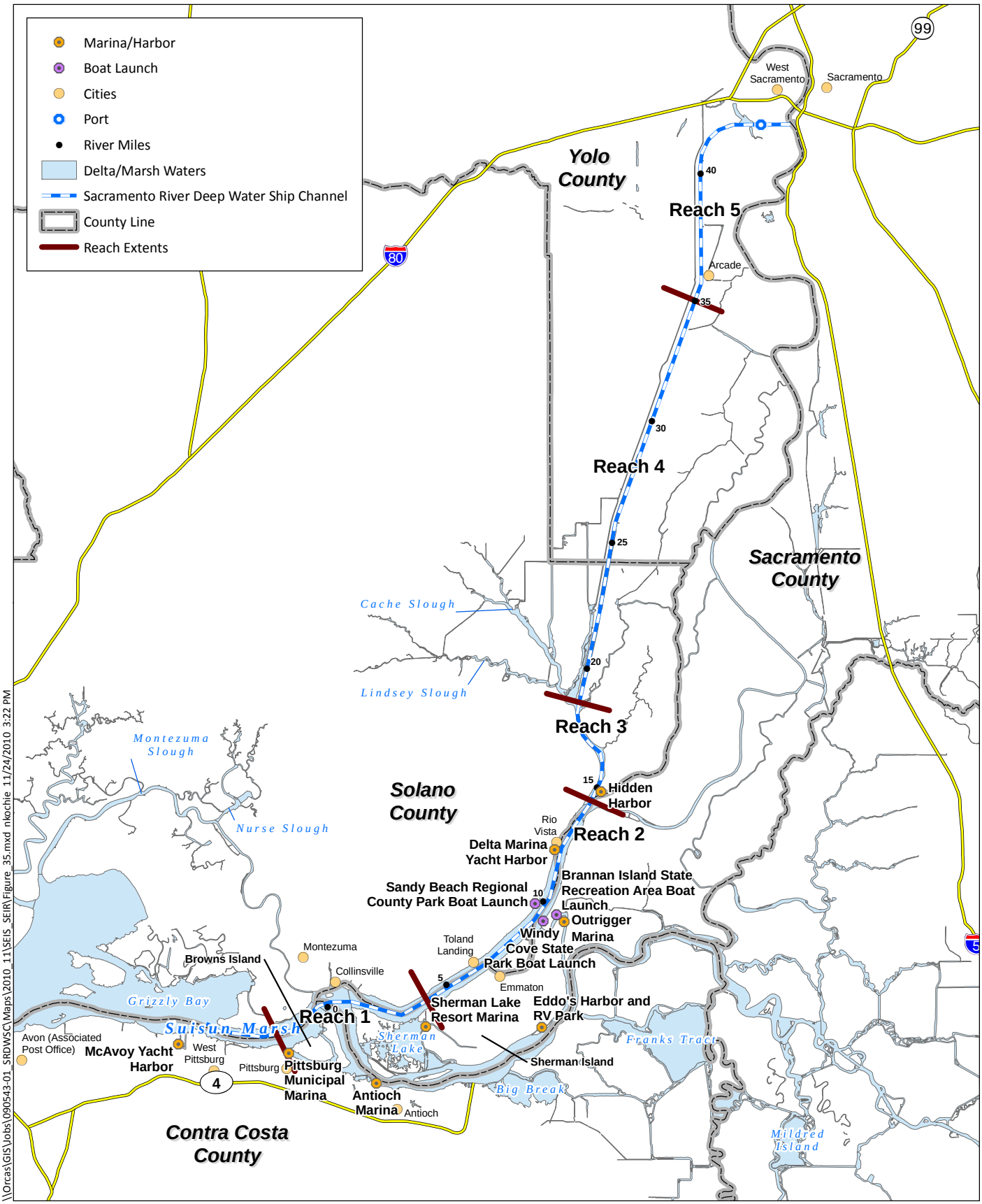


Figure 35
Marinas and Harbors within the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

Several privately-owned recreation facilities exist in Rio Vista and farther north on the west bank of the SRDWSC, including a rowing club, a duck club, and ranches.

In addition, a variety of wildlife sanctuaries exist in the study area, including Miner Slough Wildlife Area (boat access only), Jepson Prairie Preserve, Calhoun Cut Ecological Reserve near Lindsey Slough, Decker Island Wildlife Area, and LSIWA. To the west of the SRDWSC in Reach 5 is the Yolo Bypass Wildlife Area (YBWA), more than 16,000 acres of wildlife and habitat restoration area managed by CDFG. The YBWA was created with the understanding that it would remain completely compatible with flood control function of the Yolo Bypass. Most of the site comprises managed seasonal wetlands that go through an extensive dry period during the spring and summer months and are flooded in September to provide wetland habitat for migratory waterfowl and shorebirds. The YBWA is open to the public for wildlife viewing and fishing, and the Yolo Basin Foundation conducts monthly tours, bat tours, open houses, and a fall/winter speaker series. The CDFG permits hunting for waterfowl, pheasant, and mourning dove during the fall and winter months.

3.3.8.2 Methodology for Determining Impacts

Impacts to recreational resources were qualitatively evaluated based on the potential for the various alternatives to temporarily or permanently limit, alter, or result in the loss of recreational resources in the study area.

3.3.8.3 Thresholds of Significance

An alternative could have an impact on recreational (abbreviated as R in the thresholds and mitigation measures in this section) resources if it would cause the following:

- **R-1**: Substantially change the quality or availability of, or result in the decreased use of, recreational opportunities
- **R-2**: Conflict with federal, state, and local agency regulations and policies regarding recreational resources

3.3.8.4 Impacts and Mitigation Measures

R-1: Substantially change the quality or availability of, or result in the decreased use of, recreational opportunities

Future without Project Conditions (NEPA and CEQA Baseline)

Under Future without Project Conditions, ongoing use of the SRDWSC by bulk and liquid carriers accessing the Port and routine maintenance dredging operations would continue to result in temporary impacts to boating and fishing. These impacts are due to commercial marine navigation on the SRDWSC, dredging equipment location, and temporary impacts to

recreational use of shoreline areas in the vicinity of S1, S14, S16, S19, S20, and S31 from placement of the dredge slurry pipe.

The growth forecasted to occur at the Port under Future without Project Conditions would result in an increase from approximately 58 vessels in 2011 to approximately 143 vessels in 2053 traversing the SRDWSC (Ilanco Environmental 2010b). This increase in the number of ships may pose temporary impacts to recreational opportunities; however, as the movement of ships through any area is transient, impacts are expected to be negligible. Thus, there would be no impacts to the use, quality, and availability of recreational opportunities under Future without Project Conditions.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

Under the Proposed Project, the number of vessels forecasted to traverse the deepened channel would decrease. As described in Section 2.2.2, approximately 43 fewer vessels would call on the Port under the Proposed Project than under Future without Project Conditions. Future maintenance dredging activities associated with the Proposed Project would also be similar to Future without Project Conditions but would occur for a longer duration each year and most likely involve proportionately larger volumes.

Construction dredging operations and dredged material placement activities could result in temporary impacts to boating and fishing from positioned construction equipment impeding access, temporary impacts to swimming from increases in turbidity, and temporary impacts to recreational use of shoreline areas in the vicinity of all ten sites due to the placement of the dredge slurry pipe. The location of the construction equipment that could impede boating and/or fishing access is expected to be similar to Future without Project Conditions maintenance dredging activities but would occur for a longer duration and involve larger volumes of material. While construction may temporarily impede recreational opportunities on the SRDWSC, this would be a relatively short-term effect that would cease once construction was concluded. Thus, as compared to the environmental baseline, there would be temporarily less than significant incremental impacts to the use, quality, and availability of recreational opportunities due to the presence of construction equipment on the SRDWSC as a result of the Proposed Project. The mitigation measures below would be implemented to further reduce impacts to recreational resources (refer to Table 20 for complete descriptions of mitigation measures).

Mitigation Measures:

- R-MM-1: Observe U.S. Coast Guard (USGS) practices for navigation safety and communications

- R-MM-2: Establish a construction exclusion zone around the dredging operations

Residual Impact after Mitigation: After inclusion of the mitigation measures, the residual impact would be less than significant.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

As with the Proposed Project, fewer vessels would traverse the SRDWSC under the -33 Feet MLLW Alternative than under Future without Project Conditions. In the case of this alternative, approximately 29 fewer vessels would call on the Port.

Dredging operations and dredged material placement activities under the -33 Feet MLLW Alternative could result in temporary impacts to boating and fishing from positioned construction equipment impeding access, temporary impacts to swimming from increases in turbidity, and temporary impacts to recreational use of shoreline areas in the vicinity of dredged material placement sites from placement of the dredge slurry pipe. Impacts would be consistent with those of the Proposed Project. Thus, as compared to the environmental baseline, there would be temporarily less than significant incremental impacts to the use, quality, and availability of recreational opportunities due to the presence of construction equipment on the SRDWSC as a result of the -33 Feet MLLW Alternative. The mitigation measures below would be implemented to further reduce impacts to recreational resources (refer to Table 20 for complete descriptions of mitigation measures).

Mitigation Measures:

- R-MM-1: Observe USGS practices for navigation safety and communications
- R-MM-2: Establish a construction exclusion zone around the dredging operations

Residual Impact after Mitigation: After inclusion of the mitigation measures, the residual impact would be less than significant.

R-2: Conflict with federal, state, and local agency regulations and policies regarding recreational resources

Future without Project Conditions (NEPA and CEQA Baseline)

Future without Project Conditions activities would comply with current federal, state, and local agency regulations and policies. While it is possible that the cities and counties in the study area could amend regulations specific to recreational resources in their General Plans over the next 50 years, because ongoing use of the SRDWSC by commercial marine navigation and routine maintenance dredging and associated dredged material placement activities have historically occurred in the study area, it is unlikely that the regulations pertaining to recreational resources would be modified to prohibit these activities. Thus, there would be no impacts to conformance with federal, state, and local agency regulations and policies regarding recreational resources under Future without Project Conditions.

Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

The activities that would occur under the Proposed Project would comply with current federal, state, and local agency regulations and policies. While it is possible that the cities and counties in the study area could amend regulations specific to recreational resources in their General Plans, it is unlikely that the regulations pertaining to recreational resources would be modified to prohibit dredging or dredged material placement activities in the identified placement sites. Thus, as compared to the environmental baseline, there would be no impacts to conformance with federal, state, and local agency regulations and policies regarding recreational resources as a result of the Proposed Project.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

The activities that would occur under the -33 Feet MLLW Alternative would be consistent with those of the Proposed Project. Thus, as compared to the environmental baseline, there would be no impacts to conformance with federal, state, and local agency regulations and policies regarding recreational resources as a result of the -33 Feet MLLW Alternative.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

3.3.8.4.1 Summary of Impacts and Mitigation Measures

Table 75 summarizes the impact determinations, mitigation measures, and residual impacts after mitigation, if applicable, for each alternative with respect to the recreational resources impacts described above.

Table 75
Summary of Recreational Resources Impacts and Mitigation Measures

Alternative	Impact	Mitigation	Residual Impact After Mitigation
R-1: Substantially change the quality or availability of, or result in the decreased use of, recreational opportunities			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	Less than significant impact	R-MM-1 and R-MM-2	Less than significant impact
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	Less than significant impact	R-MM-1 and R-MM-2	Less than significant impact

R-2: Conflict with federal, state, and local agency regulations and policies regarding recreational resources			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	No impact	None	None
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	No impact	None	None

3.3.9 Commercial Fisheries

This section provides baseline conditions and assesses potential impacts to commercial fisheries from the Proposed Project and alternatives.

3.3.9.1 Baseline Conditions

Historically, there were a number of commercial fisheries either dependent upon or geographically located within the Delta. As early as the late 1880s, overfishing of native stocks of salmon and sole was a problem in the Delta and San Francisco Bay. As a result, American shad (*Alosa sapidissima)*, striped bass (*Morone saxatilis)*, smallmouth bass (*Micropterus dolomieui*), and largemouth bass (*Micropterus salmoides)* were brought west to California from eastern parts of the United States to boost commercial fisheries. After the non-native species were introduced in the Delta, fish populations continued to decline. These species were commercially fished from the 1880s until 1935, when all commercial fishing was stopped in the belief that this decrease in fishing would provide more fish for the recreational fishery.

Until recently, the Chinook salmon (*Oncorhynchus tshawytscha*) fishery was important in the San Francisco Bay and Delta. The state's commercial Chinook salmon fishery started in approximately 1850 in the San Francisco Bay and Delta and quickly became one of the important industries supporting settlers in the Delta. The salmon fishery remained centered in the San Francisco Bay and Delta until the early 1900s, when ocean salmon fishing began to expand and eventually came to dominate the fishery. Annual catches by the early Sacramento–San Joaquin in-river fishery commonly reached 4 to 10 million pounds, which is higher than the total statewide catches from the past several decades. Researchers have estimated that the San Francisco Bay and Delta Chinook salmon stocks may have reached approximately 1 to 2 million spawners annually (Yoshiyama et al. 1998).

Although the state of California and the federal regulatory body for fisheries management, the Pacific Fishery Management Council (PFMC), have undertaken substantial efforts to manage the Chinook salmon resource since the early years of the commercial fishery, stock levels have declined over the decades to small fractions of their previous numbers. The Chinook salmon decline is believed to have been caused by several factors: 1) poor ocean

food supply conditions; 2) destruction of river habitat; 3) reliance on hatcheries; and 4) reduction of salmon habitat and stream flows by dams and water diversions. For this reason, the PFMC closed the commercial Chinook salmon fishery in 2008 and 2009 (PFMC 2009). A commercial fishery closure has significant implications to coastal communities who rely on the fishery for their livelihood. More than 2,200 fishing industry workers lost their jobs as a result of the 2008 closure. Although they received federal disaster aid, fishing communities and fishing-related businesses lost more than $250 million (PFMC 2008).

Today, the only commercial fishery occurring within the study area is for crayfish (*Pacifastacus leniusculus),* which is a non-native species. The crayfish fishery occurs in the four counties that comprise the project area—Contra Costa, Solano, Sacramento, and Yolo counties. The fishery occurs year-round. Virtually all of the crayfish entering the commercial crayfish fishery in the Delta and lower Sacramento River belong to the genus *Pacifastacus*. While active, crayfish generally prefer depths of less than 32 feet (10 meters), but they may go deeper as adults (Flint 1977). In general, crayfish prefer coarser substrate to soft, silty sediment (Elser et al. 1994) and *P. leniusculus* generally prefer rocky substrate (Flint 1977; Klosterman and Goldman 1983; Shimizu and Goldman 1983; Lewis and Horton 1997), and avoid flat, soft bottoms (Goldman and Rundquist 1977; Elser et al. 1994). In addition, large numbers of crayfish are known to gather around rocky areas and submerged trees (Lowery and Holdich 1988; Guan and Wiles 1996; Kirjavainen and Westman 1999). Mason (1979) notes that current velocity and direction may also be involved in habitat choice of crayfish.

The total number of pounds of crayfish caught commercially within the Delta since 2005 is provided below along with the yearly average (CDFG 2008a, 2009d):

- 2005 = 66,475 pounds
- 2006 = 112,149 pounds
- 2007 = 161,791 pounds
- 2008 = 138,544 pounds
- Yearly average for 2005 to 2008 = 119,740 pounds

3.3.9.2 Methodology for Determining Impacts

Potential impacts to the commercial crayfish fishery were analyzed using a qualitative approach based on information compiled on the location and intensity (i.e., catch records) of the crayfish fishery, and crayfish habitat preferences relative to the specific actions of the alternatives under evaluation. Additionally, potential impacts were analyzed using professional expertise and judgment in evaluating the activities associated with the various alternatives and how these activities could interact with and impact the commercial crayfish fishery.

3.3.9.3 Thresholds of Significance

An alternative could have an impact on the commercial crayfish fishery (abbreviated as CF in the thresholds in this section) if it would cause the following:

- **CF-1**: Restrict fisher access to crayfish fishing areas
- **CF-2**: Decrease the crayfish population as a whole

3.3.9.4 Impacts and Mitigation Measures

CF-1: Restrict fisher access to crayfish fishing areas

Future without Project Conditions (NEPA and CEQA Baseline)

Under Future without Project Conditions, fisher access to crayfish fishing areas could be impacted by the placement of equipment used for ongoing maintenance dredging activities that are expected to occur as they have in the past. Over the last 5 years, the crayfish fishery landed approximately 120,000 pounds on average each year. This information indicates that the commercial fishers targeting crayfish were able to access crayfish fishing areas over the last 5 years regardless of regular maintenance dredging every fall. While there would be an increase in the number of vessels on the SRDWSC, this impact is not anticipated to have a significant impact on fisher access to fishing areas. Thus, there would be no impacts to fishers' access to crayfish fishing areas under Future without Project Conditions.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

Although there would be approximately 43 fewer vessels calling on the Port and traversing the SRDWSC under the Proposed Project as compared to Future without Project Conditions, fisher access to crayfish fishing areas could be impacted by the location of construction equipment used to dredge the channel for widening and deepening under the Proposed Project. The location of the construction equipment that could impede fisher access to crayfish fishing areas is expected to be similar to the maintenance dredging activities that are a part of Future without Project Conditions, but would occur for a longer duration. The ongoing maintenance activities associated with the Proposed Project would be a slightly greater volume (on the order of 10%) than under Future without Project Conditions.

The additional equipment in the water that would be necessary to implement the Proposed Project and ongoing maintenance is not expected to restrict fisher access to crayfish fishing areas because the project area is a small percentage of the overall aquatic area, and crayfish are not expected to congregate in the navigation channel because they prefer rocky substrate (Flint 1977; Klosterman and Goldman 1983; Shimizu and Goldman 1983; Lewis and Horton

1997). In addition, crayfish prefer a rocky substrate and avoid flat, soft bottoms (Goldman and Rendquist 1977; Elser et al. 1994) and are not expected to congregate in the navigation channel. Thus, as compared to the environmental baseline, there would be incrementally increased but less than significant impacts to fishers' access to crayfish fishing areas as a result of the Proposed Project.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: The residual impact would be less than significant.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

As with the Proposed Project, although there would be approximately 29 fewer vessels on the SRDWSC with the -33 Feet MLLW Alternative as compared to Future without Project Conditions, fisher access to crayfish fishing areas could be impacted by the location of construction equipment used to dredge the channel for widening and deepening. The location of the construction equipment that could impede fisher access to crayfish fishing areas is expected to be similar to that of the Proposed Project, but would occur for a shorter duration. Future maintenance activities associated with the -33 Feet MLLW Alternative are expected to be similar to those for the Proposed Project, but would occur for a shorter duration each year. Thus, as compared to the environmental baseline, there would be incrementally increased but less than significant impacts to fishers' access to crayfish fishing areas as a result of the -33 Feet MLLW Alternative.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: The residual impact would be less than significant.

CF-2: Decrease the crayfish population as a whole

Future without Project Conditions (NEPA and CEQA Baseline)

Under Future without Project Conditions, individual crayfish may be impacted by increased commercial shipping and ongoing maintenance dredging activities including entrainment in the equipment, noise, turbidity, and the disruption of the benthic community within the SRDWSC; however, these potential impacts are not expected to affect the species at the population level (which would reduce commercial fishing catches). Thus, there would be no impacts to the crayfish population as a whole under Future without Project Conditions.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

Construction impacts related to the Proposed Project implementation and maintenance including entrainment, noise, turbidity, and the disruption of the benthic community within the navigation channel could impact crayfish within the SRDWSC. The impacts, however,

are not expected to affect crayfish at the population level such that commercial fishing catches would be reduced because the project area is a small percentage of the overall aquatic area, and crayfish are not expected to congregate in the navigation channel because they prefer rocky substrate types (Flint 1977; Klosterman and Goldman 1983; Shimizu and Goldman 1983; Lewis and Horton 1997). In addition, crayfish prefer a rocky substrate and avoid flat, soft bottoms (Goldman and Rendquist 1977; Elser et al. 1994) and are not expected to congregate in the navigation channel. Thus, as compared to the environmental baseline, there would be less than significant incremental impacts to the crayfish population as a whole as a result of the Proposed Project.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: The residual impact would be less than significant.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

As with the Proposed Project, construction impacts related to the -33 Feet MLLW Alternative implementation and maintenance could impact crayfish within the SRDWSC. The impacts for this alternative would last for a shorter duration than for the Proposed Project and are not expected to affect crayfish at the population level such that commercial fishing catches would be reduced because the project area is a small percentage of the overall aquatic area and crayfish are not expected to congregate in the SRDWSC, as described above for the Proposed Project. Thus, as compared to the environmental baseline, there would be less than significant incremental impacts to the crayfish population as a whole as a result of the -33 Feet MLLW Alternative.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: The residual impact would be less than significant.

3.3.9.4.1 Summary of Impacts and Mitigation Measures

Table 76 summarizes the impact determinations and residual impacts after mitigation, if applicable, for each alternative with respect to the commercial fisheries impacts described above.

Table 76
Summary of Commercial Fisheries Impacts and Mitigation Measures

Alternative	Impact	Mitigation	Residual Impact After Mitigation
CF-1: Restrict fisher access to crayfish fishing areas			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	Less than significant impact	None	Less than significant impact

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	Less than significant impact	None	Less than significant impact
CF-2: Decrease the crayfish population as a whole			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	Less than significant impact	None	Less than significant impact
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	Less than significant impact	None	Less than significant impact

3.3.10 Marine Navigation and Transportation

This section assesses potential impacts to vessel traffic on the SRDWSC due to changes in fleet composition, as well as from navigational constraints and hazards present within the study area.

3.3.10.1 Baseline Conditions

This section summarizes existing vessel traffic, ports, marinas, harbors, and navigational constraints within the study area.

3.3.10.1.1 Vessel Traffic

Vessel traffic within the study area is primarily commercial and recreational. The SRDWSC is the route used by all commercial vessels accessing the Port. A significant amount of recreational boating occurs throughout much of the study area, especially in Reaches 1 and 2. A small but regular amount of military and government vessel traffic also passes through the study area.

The majority of commercial vessel traffic within the study area is bulk or general cargo carriers in transit from the Pacific Ocean (via San Francisco Bay) to the Port. All commercial vessels en route to the Port are piloted by the San Francisco Bar Pilots. The SRDWSC as it exists today, with the exception of Reach 5 (which was previously dredged to -35 feet MLLW), was originally designed to accommodate a loaded Victory class ship with characteristics of 10,800 deadweight tonnage (DWT), approximately 450 feet in length, 62 feet in width, and 28 feet loaded draft. Today, the SRDWSC regularly accommodates vessels with loaded drafts up to 30 feet and lengths greater than 600 feet (USACE 1980, 2009c). Tables 77 and 78 present the draft constraints for bulk and general cargo carriers that call on the Port according to vessel class (size) by DWT and maximum design draft (USACE 2009d).

Table 77
Draft Constraints for Bulk Cargo Carriers

Vessel Design Draft (feet)	Vessel Size (DWT)
28	15,000
34	25,000
36	35,000
40	40,000
40	50,000

Table 78
Draft Constraints for General Cargo Carriers

Vessel Design Draft (feet)	Vessel Size (DWT)
29	11,000
30	14,000
32	16,000
32	20,000
33	30,000
33	24,000

As shown in the tables, vessels in all but the smallest class of bulk cargo carriers and the two smallest classes of general cargo carriers have design drafts greater than the 30-foot channel draft constraint. Therefore, all vessels larger than these classes have to be light-loaded to call on the Port to avoid the risk of grounding. Light loading contributes to additional vessel trips to transport the same amount of cargo. Despite this limitation, the current fleet of vessels calling on the Port is heavily weighted toward the larger vessels with higher DWT and larger design drafts, as described in Section 2.2.1.1.1. From 2006 through 2008, 100% of bulk cargo carrier vessels and 92% of general cargo carrier vessels moving through the Port had design drafts exceeding 30 feet (USACE 2010c). Since larger vessels generally have lower costs per ton, key determinants of shipping costs for a given trade route and commodity are the size of the vessel and whether the vessel can sail fully-loaded or whether it must be light-loaded. The proposed channel deepening would allow more fully loaded, larger vessels, resulting in significant transportation cost savings as well as a potential reduction in overall trips.

In addition to the commercial vessels, Brusco Tug and Barge tugboats operate in the study area, most commonly in Reach 5 within the Port. Tugboats are used to transport bar pilots to commercial bulk and general cargo vessels, and to help maneuver vessels into the Port.

Several small commercial cruise lines and charter yachts offer Delta tours and private cruises at various locations in and near the study area. Many of these commercial cruises pass

through the study area; however, they are typically based outside of the study area, in either Sacramento or Stockton. In the past, commercial cruise services have been offered through the study area, from San Francisco to Sacramento.

As is described in Section 3.4.8, the study area is also used by many recreational boaters throughout all seasons of the year. Privately owned recreational vessels are used for sailing, fishing, and wildlife viewing within the study area.

A regular ferry route operates just north of Rio Vista in Reach 2 of the study area and crosses to Ryer Island. The Rio Vista/Ryer Island Ferry is operated by Caltrans as part of State Highway 84. The ferry is free to ride, runs 24 hours a day, and takes approximately 4 minutes to cross the channel in either direction.

The U.S. Coast Guard regularly patrols all reaches of the study area and has recently increased its patrol fleet in response to boating accidents (USCG 2008).

3.3.10.1.2 Ports, Marinas, and Harbors

The Port enjoys an excellent reputation among shippers and is in a strategic position to benefit in the future from increased shipments to and from the Pacific Ocean. it's the primary exports from the Port are bagged and bulk rice and the primary imports are cement. The Port is also used for importing large wind power generation equipment. The City of West Sacramento plans to expand the services of the Port to include a new cement terminal as well as a state-of-the-art biodiesel manufacturing facility. The Port has seven berths; a 200-railcar terminal area marshaling yard; and fugitive dust, wash water, and stormwater control systems. In terms of commodity handling capabilities, the Port offers bulk-rice and bulk-grain elevators, a bulk-commodities-bagging facility, and dry-bulk cargo warehousing. More than 50 trucking companies provide a range of services and equipment at the Port. The Port also has a 200-railcar terminal area marshaling yard and is serviced by Burlington Northern Santa Fe (BNSF), Union Pacific, and Sierra Northern railways (Port of West Sacramento n.d.). Four major freeway systems bisect the West Sacramento/Sacramento area: I-80 and United States Route 50 (US 50) are major east-west directional arterial highways, and I-5 and US 99 are major north-south highways.

The marinas and harbors located in or just adjacent to the study area are described in Table 74 and shown on Figure 35 (Section 3.3.8.1).

3.3.10.1.3 Constraints and Hazards to Marine Navigation

A number of constraints and hazards to marine navigation exist within the study area, including islands and shoals, bridges and other structures, fog and inclement weather, tides,

and vessel traffic, including ferries.

The study area and the Delta as a whole consist of a multitude of small natural and man-made channels, or sloughs, creating a system of isolated lowland islands and wetlands defined by levees. More than 12 islands in the study area form the perimeter of the SRDWSC.

In addition, a number of shoals that can pose hazards to navigation exist within the study area. The Fraser Shoal is located across from Collinsville; the San Andreas Shoal is located off of Brannan Island; a shoal is located from Rio Vista to Junction Point; and additional grounding spots can be found at Cache Slough and the entrance to the man-made portion of the SRDWSC (USACE 1980). These islands and shoals present a hazard to navigation by reducing the channel depth to below the authorized depth, thus reducing under-keel clearance and maneuverability.

In June 2010, USACE completed the *Navigation Study for Sacramento Deep Water Ship Channel Improvement Data Report* (Webb and Sturm 2010; Appendix F), which provided the results of a ship simulation study to analyze navigational constraints due to channel width. The report found that widening in the following areas would be beneficial for navigation:

- At the approach to the State Route (SR) 12/Rio Vista Bridge in Rio Vista – the bridge is not perpendicular to the SRDWSC and poses navigational constraints for upbound transits
- At the confluence of the Cache Slough and the SRDWSC – cross-currents in this area present difficulties to navigation
- At the 20-degree turn in the man-made portion of the SRDWSC
- At the 90-degree turn (or curve) on the approach to the Port's turning basin – of particular concern in this area are two docks that could have vessels alongside

Windy weather can impair the maneuverability of slowly moving ships, and fog creates an issue for larger ships with little keel or beam clearance. Windy weather and fog issues are compounded when a vessel is more fully loaded and nearing the maximum draft clearance, because there is little room for error, particularly in the narrow portions of the SRDWSC. In these conditions, ship operators are forced to carry less than capacity loads or await favorable tides, thus reducing the ship's efficiency and increasing the unit cost of transportation. As ship size and number increases, navigation in channels with restricted clearances becomes more hazardous during inclement weather or foggy conditions.

The Delta is influenced by tidal action from the Pacific, resulting in approximately four daily

tides (two highs and two lows), which has an impact on navigation within the study area. Water levels in the Delta can also be affected by man-made structures or operations, such as the pumping of the State Water Project, the Central Valley Project Pumping Plants, and the placement of temporary barriers in Old River, Middle River, and Grantline Canal. Water levels are also affected on occasion by floodwaters from the Sacramento and San Joaquin rivers, as well as by low pressure systems and winds. Winds from the south can push water from the south to the north, increasing water above predicted levels at Rio Vista, while winds pushing water from the San Francisco Bay to the north can increase water levels in San Pablo Bay, thereby impairing the ability of the Delta to drain. During high water levels, all vessel traffic en route to the Port is halted in the Delta due to concerns over levee erosion from vessel wakes.

Commercial vessels and recreational boater traffic can act as a constraint to vessels moving in the SRDWSC, particularly in the channel's narrower areas and in constrained areas within the Port. For example, vessels at the Port's cement pier require temporary relocation when vessels with lengths between 700 and 800 feet transit the 90-degree turn. Tugs must also be on standby during these times. Furthermore, the man-made portion of the SRDWSC is entirely one way. The only area for cargo vessels and tankers to pass one another is at the Port; two fully-loaded ships cannot currently travel in the same direction on the river on the same tide.

The daily operations of the Rio Vista/Ryer Island Ferry and recreational boat traffic on the river have no impact on commercial shipping.

SR-12/Rio Vista Bridge

The SR-12/Rio Vista Bridge is the only bridge in the study area. While drawbridge operations do not necessarily constrain ship size, the frequent operation of the drawbridge causes traffic delays that are expected to worsen as ship traffic increases. A study commissioned by Caltrans and the Solano Transportation Authority in 2010 noted that under current operating conditions, one bridge opening for a large cargo vessel causes an 875-vehicle back-up stretching 1.25 miles in each direction (AECOM 2010).

Caltrans intends to widen or relocate the SR-12/Rio Vista Bridge; however, a definitive plan has not been proposed to date.

3.3.10.2 Methodology for Determining Impacts

Impacts to marine navigation and transportation were qualitatively evaluated based on the potential for the various alternatives to impact ongoing commercial shipping, freedom of movement, or safety. The USACE *With-Project Economics Analysis* did not estimate future

vessel calls (USACE 2011; Appendix E). Estimates for future vessel calls were determined based on forecasted commodity throughput, vessel size, and fleet mix. The fleet mix for each vessel type and class was scaled by throughput and vessel payload. The payload represents the weight of commodity that can be loaded on a vessel such that the vessel still clears the available draft of the channel.

3.3.10.3 Thresholds of Significance

An alternative could have an impact on marine navigation and transportation (abbreviated as MNT in the thresholds in this section) if it would cause the following:

- **MNT-1**: Change in vessel traffic patterns resulting in unplanned or regularly occurring delays, adverse change in freedom of movement, increase in safety risks, or introduction of a safety hazard
- **MNT-2**: Increased traffic delays at the SR-12/Rio Vista Bridge

3.3.10.4 Impacts and Mitigation Measures

MNT-1: Change in vessel traffic patterns resulting in unplanned or regularly occurring delays, adverse change in freedom of movement, increase in safety risks, or introduction of a safety hazard

Future without Project Conditions (NEPA and CEQA Baseline)

Under Future without Project Conditions, there would be an increase in vessel traffic calling on the Port absent any improvements to the SRDWSC other than normal maintenance dredging. Annual vessel calls are anticipated to increase from approximately 58 in 2011 to approximately 143 in 2053 under Future without Project Conditions (Ilanco Environmental 2010b). According to the San Francisco Bar Pilots, this predicted increase to approximately 143 vessels (or 286 roundtrips to and from the Port) could result in delays on the river. Although predicting the delays is difficult because the prediction is dependent on timing and tides, the Bar Pilots indicated that two fully loaded vessels traveling in opposite directions cannot currently maximize their draft on the same tide. This constraint is exacerbated under Future without Project Conditions due to the increase in vessel calls (Miller 2010). As more vessels traverse the SRDWSC, delays could increase. Vessels calling on the Port would also continue to experience navigational constraints in narrower portions or areas that are difficult to maneuver in the SRDWSC, as described above.

Maintenance dredging activities would continue under Future without Project Conditions. Dredging areas would typically correspond to the areas known to frequently experience shoaling, which are shown in Figure 3. Marine-based construction equipment needed for maintenance dredging would move to avoid affecting commercial vessel movement within

the SRDWSC. Barges and tugs would be highly visible and relatively stationary, and would also be required to comply with local safety requirements including publication of construction announcements in the U.S. Coast Guard Local Notice to Mariners. Future maintenance dredging, therefore, is not anticipated to result in any impact to operations on the SRDWSC.

Thus, under Future without Project Conditions, the portions of the SRDWSC that are narrow and difficult to maneuver would remain so, and there would be increasing vessel delays due to inefficient use of the river by increasing numbers of vessels. These impacts would be increasingly adverse over time. These impacts would be potentially significant under Future without Project Conditions.
Mitigation Measures: Mitigation is not feasible.
Residual Impact after Mitigation: The residual impact would be potentially significant.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

Under the Proposed Project, the number of vessels traversing the SRDWSC en route to the Port is anticipated to consist of fewer, heavier vessels than under Future without Project Conditions. The forecasted change in the fleet mixes of the bulk carriers and tankers calling on the Port is shown in Tables 11 and 12. Predicted vessels calls would increase from approximately 58 in 2011 to approximately 100 in 2053, which represents a reduction of approximately 43 as compared to Future without Project Conditions (Ilanco Environmental 2010b). In addition, according to the San Francisco Bar Pilots, the increased draft of the SRDWC may permit two fully-loaded vessels to travel in opposite directions on the same tide (Miller 2010). The reduction of the number of vessels on the SRDWSC, as well as increased efficiency of use of the channel, represents a benefit of the Proposed Project because vessel delay will likely be reduced.

The Proposed Project involves widening in the areas recommended in the *Navigation Study for Sacramento Deep Water Ship Channel Improvement Data Report* (Appendix F). The constraints that vessels currently experience en route to the Port, as discussed under Future without Project Conditions, would thus no longer exist with the Proposed Project, representing a safety improvement.

Dredging equipment required for construction would be present within the study area for approximately 6 months over a span of approximately 4 years. After construction is complete, annual maintenance dredging is expected to continue within the channel. Dredging equipment would be highly visible, relatively stationary, and able to relocate in the event of oncoming traffic. Dredging and dredged material placement operations, including positioning of the dredge pipeline, would also be required to comply with local safety

requirements, such as using navigational aids and publishing construction announcements in the U.S. Coast Guard Local Notice to Mariners. Therefore, construction, dredging, and future maintenance dredging are not anticipated to interfere with existing operations on the SRDWSC.

As compared to the environmental baseline, the Proposed Project would result in no impact to marine navigation and transportation because it would remove navigational hazards, reduce the number of vessels on the SRDWSC, and reduce vessel delays. These conditions represent a project benefit as compared to Future without Project Conditions.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

The forecasted change in the fleet mixes of the bulk carriers and tankers calling on the Port are shown in Tables 16 and 17. Predicted vessels calls are expected to increase from approximately 58 in 2011 to approximately 114 in 2053. This represents a reduction of approximately 29 vessels as compared to Future without Project Conditions, and an increase of approximately 14 vessels as compared to the Proposed Project (Ilanco Environmental 2010b). Similar to the Proposed Project, the reduction of vessels on the SRDWSC, as well as increased efficiency of use of the channel, represents a benefit of the -33 Feet MLLW Alternative because it will likely reduce vessel delay.

The -33 Feet MLLW Alternative involves widening in the same areas as the Proposed Project; thus, the constraints that vessels currently experience en route to the Port in those specific areas would no longer exist (Appendix F).

Dredging equipment required for construction would be present within the study area for approximately 6 months over a span of approximately 2 to 3 years, after which annual maintenance dredging would continue within the channel. Potential impacts of these activities under the -33 Feet MLLW Alternative would be consistent with those of the Proposed Project; thus, construction dredging and future maintenance dredging are not anticipated to interfere with existing operations on the SRDWSC.

Thus, as compared to the environmental baseline, the -33 Feet MLLW Alternative would result in no impact to marine navigation and transportation because it would remove navigational hazards, reduce the number of vessels on the SRDWSC, and reduce vessel delays. These conditions represent a project benefit as compared to Future without Project Conditions.
Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

MNT-2: Increased traffic delays at the SR-12/Rio Vista Bridge

Future without Project Conditions (NEPA and CEQA Baseline)

The Caltrans and Solano Transportation Authority study predicted that in 2030, based on forecast growth in Port operations as well as community growth around the bridge, a commercial vessel could cause a 2,305-vehicle back-up stretching 3.25 miles in each direction (AECOM 2010). This represents a significant increase over baseline conditions. While Caltrans and the Solano Transportation Authority are studying several options for replacing the bridge, no viable project has been identified and funded. Replacing the bridge is the only viable mitigation measure (AECOM 2010). Thus, there would be a potentially significant impact to traffic delays at the SR-12/Rio Vista Bridge under Future without Project Conditions.

Mitigation Measures: Mitigation is not feasible.

Residual Impact after Mitigation: The residual impact would be potentially significant.

Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening

Under the Proposed Project, traffic at the SR-12/Rio Vista Bridge would likely be reduced as compared to Future without Project Conditions due to the forecast reduction in the number of vessels. Consequently, traffic delays at the bridge would be reduced. This represents a project benefit. As compared to the environmental baseline, the Proposed Project would have no impact on traffic delays at the SR-12/Rio Vista Bridge.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

Similar to the Proposed Project, under the -33 Feet MLLW Alternative, traffic at the SR-12/Rio Vista Bridge would likely be reduced as compared to Future without Project Conditions due to the forecast reduction in the number of vessels. Consequently, traffic delays at the bridge would be reduced. This represents a project benefit. As compared to the environmental baseline, the -33 Feet MLLW Alternative would have no impact on traffic delays at the SR-12/Rio Vista Bridge.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

3.3.10.4.1 Summary of Summary of Impacts and Mitigation Measures

Table 79 summarizes the impact determinations, mitigation measures, and residual impacts after mitigation, if applicable, for each alternative with respect to the marine navigation and

transportation impacts described above.

Table 79
Summary of Marine Navigation and Transportation Impacts and Mitigation Measures

Alternative	Impact	Mitigation	Residual Impact After Mitigation
MNT-1: Change in vessel traffic patterns resulting in unplanned or regularly occurring delays, adverse change in freedom of movement, increase in safety risks, or introduction of a safety hazard			
Future without Project Conditions (NEPA and CEQA Baseline)	Potentially significant impact	None feasible	Potentially significant impact
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	No impact	None	No impact
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	No impact	None	No impact
MNT-2: Increased traffic delays at the SR-12/Rio Vista Bridge			
Future without Project Conditions (NEPA and CEQA Baseline)	Potentially significant impact	None feasible	Potentially significant impact
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	No impact	None	No impact
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	No impact	None	No impact

3.3.11 Hazardous, Toxic, and Radioactive Waste

This section describes the available information on hazardous materials potentially present within the study area, including in the SRDWSC and upland placement sites. This includes potentially hazardous sites listed within existing city, county, tribal, state, and federal database records, as well as the potential presence of hazardous materials within dredged sediments. Existing land uses in and around the study area are also discussed as related to potential exposure of individuals and sensitive receptors to hazardous materials.

3.3.11.1 Baseline Conditions

The use of hazardous materials in existing development and any proposed future activities involving hazardous materials or the generation of hazardous wastes are governed by federal, state, and local regulations and agencies, which are summarized in this section.

3.3.11.1.1 Federal Regulatory Setting

Comprehensive Environmental Response, Compensation, and Liability Act/Superfund Amendments and Reauthorization Act – The Comprehensive Environmental Response, Compensation, and Liability Act/Superfund Amendments and Reauthorization Act (CERCLA) authorizes removal and remedial actions to clean up sites contaminated by hazardous substances. CERCLA addresses the National Contingency Plan, which provides

the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances at identified sites, which are on the National Priority List (NPL). CERCLA regulations apply if NPL sites would be affected by the Proposed Project or alternatives.

Resource Conservation and Recovery Act – The Resource Conservation and Recovery Act (RCRA) provides for cradle-to-grave regulation of hazardous waste and addresses used oil management and recycling, storage of hazardous materials, underground storage tanks, handling of medical wastes, and disposal of hazardous waste. RCRA requires that federal agencies establish programs for the procurement of recovered or recycled materials. Like CERCLA, RCRA regulations apply to projects that involve hazardous waste sites or are sites used for the storage of hazardous materials.

Toxic Substances Control Act – The Toxic Substances Control Act (TSCA) limits or prohibits the manufacture, processing, distribution, use, and disposal of certain toxic substances. The TSCA contains requirements specific to asbestos, indoor radon abatement, and lead exposure reduction. TSCA regulations apply to projects that involve regulated substances or hazardous materials.

3.3.11.1.2 State Regulatory Setting

Department of Toxic Substances Control – The Department of Toxic Substances Control administers laws and regulations related to hazardous waste and hazardous substances pursuant to Division 20, Chapters 6.5 and 6.8 of the California Health and Safety Code and Title 22 of the California Code of Regulations (CCR), which are the state equivalents of RCRA and CERCLA, respectively.

Regional Water Quality Control Board – The Regional Water Quality Control Board (RWQCB) enforces laws and regulations governing releases of hazardous substances and petroleum pursuant to Division 20, Chapters 6.7, 6.75, and 6.8 of the California Health and Safety Code and the Porter-Cologne Water Quality Control Act (Division 7, Section 13100 et seq. of the California Water Code) and CCR Title 23. In particular, the RWQCB focuses on all petroleum releases and those hazardous substance releases that may impact groundwater or surface water.

California Division of Occupational Safety and Health – The California Division of Occupational Safety and Health is responsible for assuring worker safety, and assumes primary responsibility for developing and enforcing standards for safe workplaces and work practices. Regulations that specifically address protection of construction workers from exposure to hazardous substances are found in Title 8 of the CCR.

California Office of Emergency Services – The California Office of Emergency Services administers the emergency response plan to coordinate emergency services provided by federal, state, and local government and private agencies. This includes responding to hazardous materials incidents. The California Office of Emergency Services is also the state administering agency for the California Accidental Release Prevention Program and California's Hazardous Materials Release, Response, and Inventory Law.

3.3.11.1.3 Local Regulatory Setting

Individual Certified Uniform Program Agencies – Certified Uniform Program Agencies (CUPA) perform hazardous materials and hazardous waste regulatory activities at the local level. In Sacramento County, the Environmental Management Department has been designated as the Sacramento region's CUPA (Sacramento County 2011), while the Department of Resource Management, Environmental Health Services Division and the Environmental Health Department act as the CUPAs for Solano and Yolo counties, respectively (Solano County n.d.; Yolo County 2008). The CUPA program streamlines and provides consistent regulatory activities, including inspections, permitting, and enforcement, including but not limited to these environmental and emergency response areas:

- Hazardous Materials Business Plan Management Program
- California Accidental Release Program
- Underground Storage Tank Program
- Aboveground Petroleum Storage Act Program Hazardous Waste Management
- Hazardous Waste Generator and On-site Hazardous Waste Treatment Program

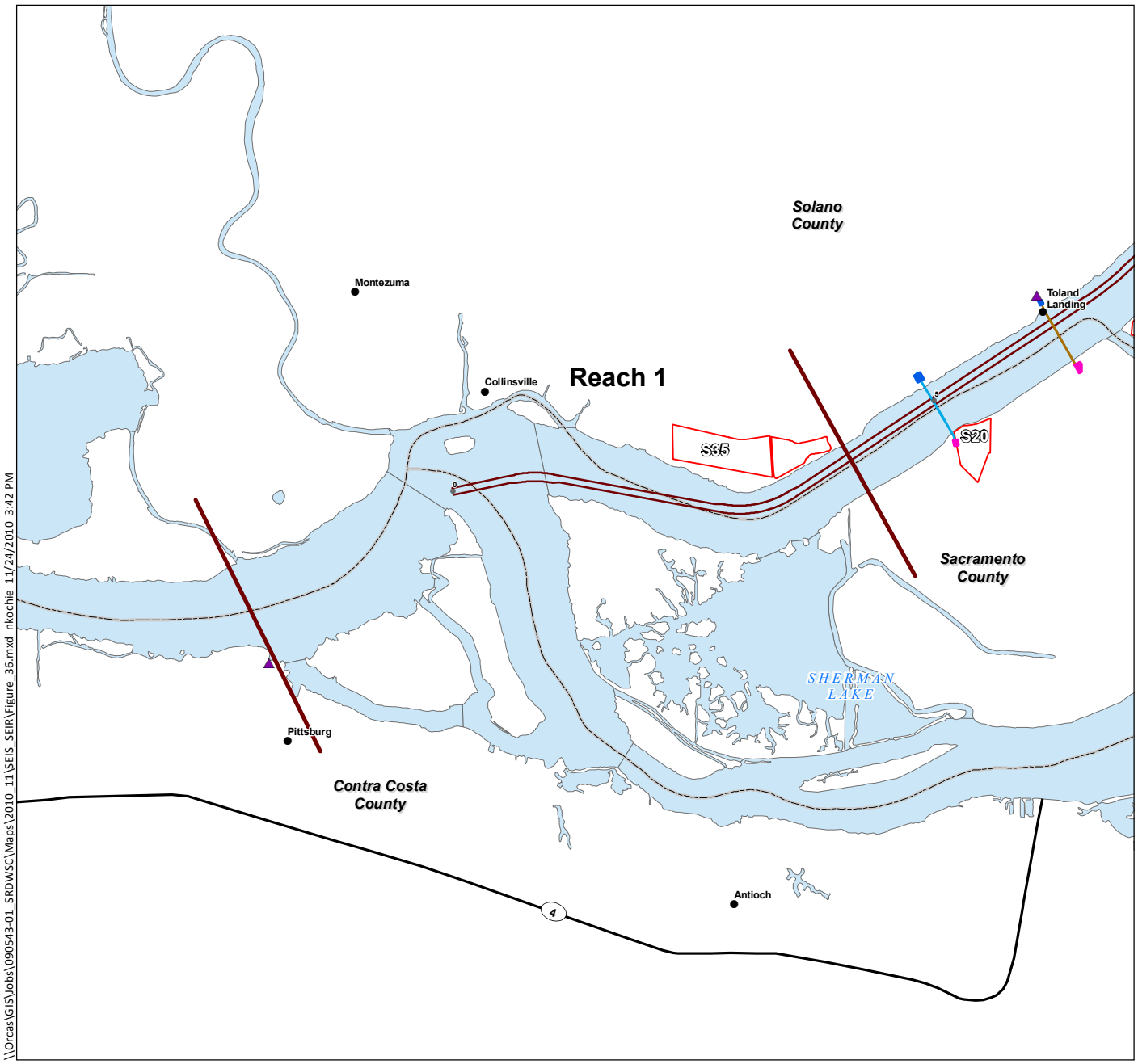
3.3.11.1.4 Site Conditions

A Phase I Environmental Site Assessment Records Review was completed in 2009 for the Proposed Project (ERM 2009) and is included as Appendix Q to this Draft SEIS/SEIR. This assessment involved a review of existing city, county, tribal, state, and federal database records for sites with known or potential hazardous waste and/or materials within the study area (conducted by Environmental Data Resources, Inc. on behalf of Environmental Resources Management for USACE). The assessment revealed no potential hazardous, toxic, and radioactive waste (HTRW) concerns identified within the SRDWSC itself; therefore, abatement of environmental contamination would not be necessary for dredging within the SRDWSC. The assessment identified 176 upland properties within the study area that were listed on databases indicative of past HTRW issues. Of the 176 properties, 142 sites were identified as either having no releases, having releases to soil only, or in regulatory case-closed status due to completed cleanup and/or remedial activities; these 142 sites were determined not to be likely to pose hazardous risks during construction as part of the evaluated alternatives.

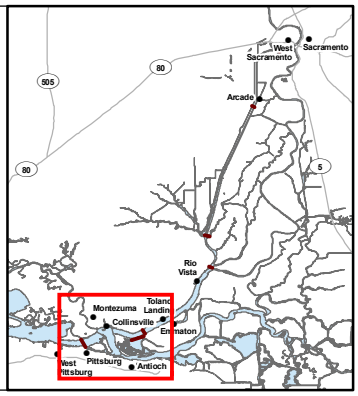
The remaining 34 sites were identified as properties that are more likely to pose hazardous risks during construction. In most cases, these sites have a history of hazardous materials releases impacting groundwater, an open or active regulatory status, and are in the vicinity of the study area. Within the study area, there are two PG&E gas pipelines that may need to be relocated. These known utility replacement locations and their associated upland construction areas are discussed in Section 2.2.2.4 and shown in Figure 36. Of the 34 HTRW sites that pose a higher risk, two are within 300 feet of known utility replacement upland construction access areas and several contaminated groundwater sites exist near the shoreline of the SRDWSC in the vicinity of Rio Vista and the Port. Construction activities would occur away from known HTRW sites, and upset of existing hazardous materials is not anticipated.

Sediment testing was conducted to quantify the bulk concentrations of sediment-associated heavy metals and pesticides, and evaluate potential releases during dredging and placement of dredged materials. Details and results of sediment testing are described in Section 3.1.3. Sediment quality of the removed material was, and is anticipated to remain, acceptable for placement and no unacceptable contamination of soils is anticipated to occur at the dredged material placement sites. Transport and placement of sediment would not create a significant hazard to the public or the environment. No other potentially hazardous materials would be handled or transported as part of the Proposed Project or alternatives.

All of the proposed dredged material placement sites are located in rural areas away from people, structures including schools and airports, or other sensitive areas. Sediment testing has shown that dredging and dredged material transport would not expose any sensitive receptors within the project vicinity to increases in hazards or hazardous materials. There would be no impacts associated with emission of hazardous materials in the vicinity of schools, nor would the Proposed Project or alternatives result in a safety hazard to airports or airstrips. The Proposed Project and alternatives would not expose people or structures to increased risk from wildland fires.



HTRW Site of Potential Concern (More Likely)
HTRW Site of Potential Concern (Less Likely)
Channel Proposed
Utility Line 114
Utility Line 130
Utility Line 400
Proposed Drilling
Proposed Exit
Cities
Port
Major Roads
Placement Sites
County Line
Delta/Marsh Waters



Miles
0 0.75 1.5 2.25 3
N

Figure 36a
Known HTRW Sites within 1,000 Feet of the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

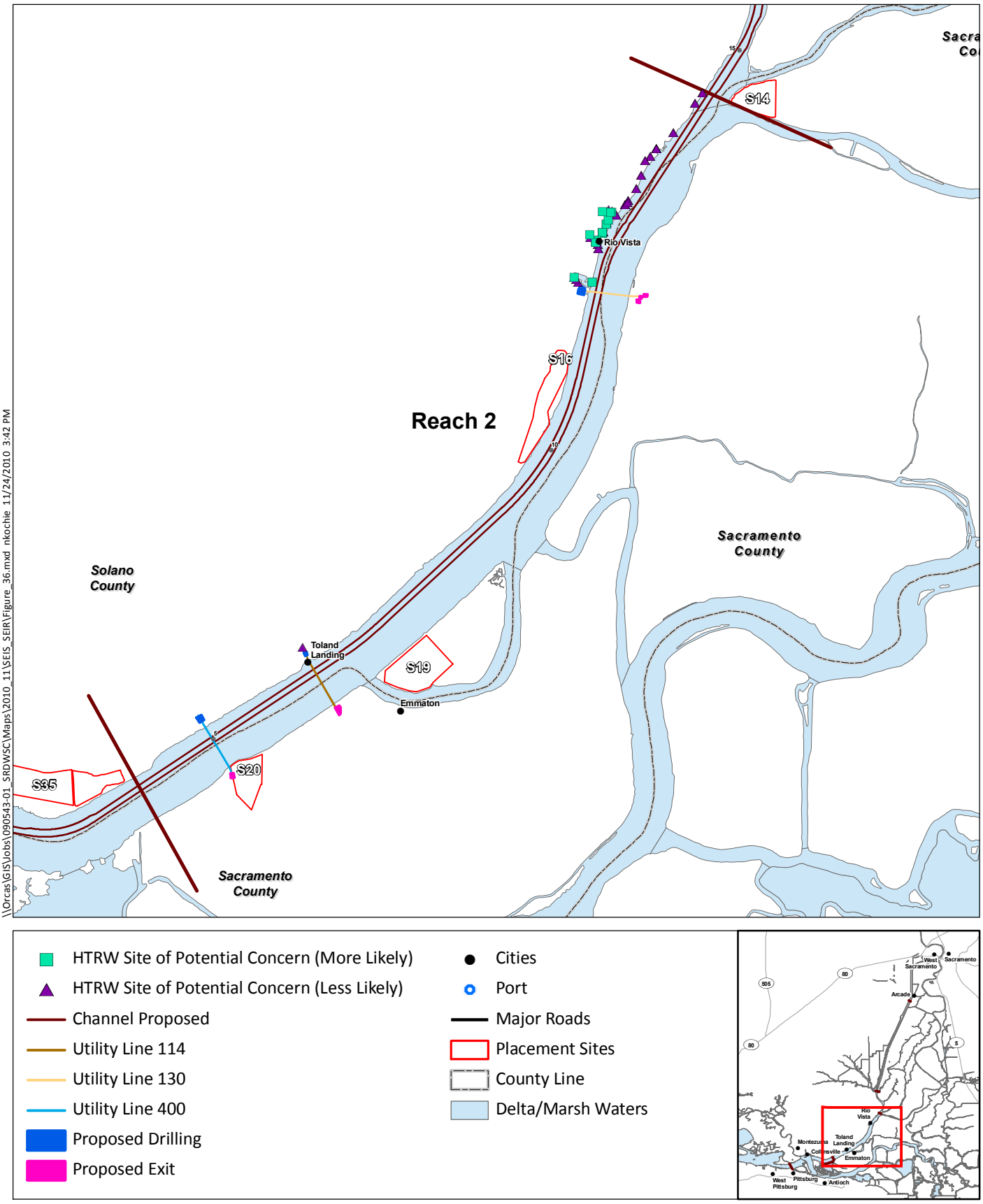


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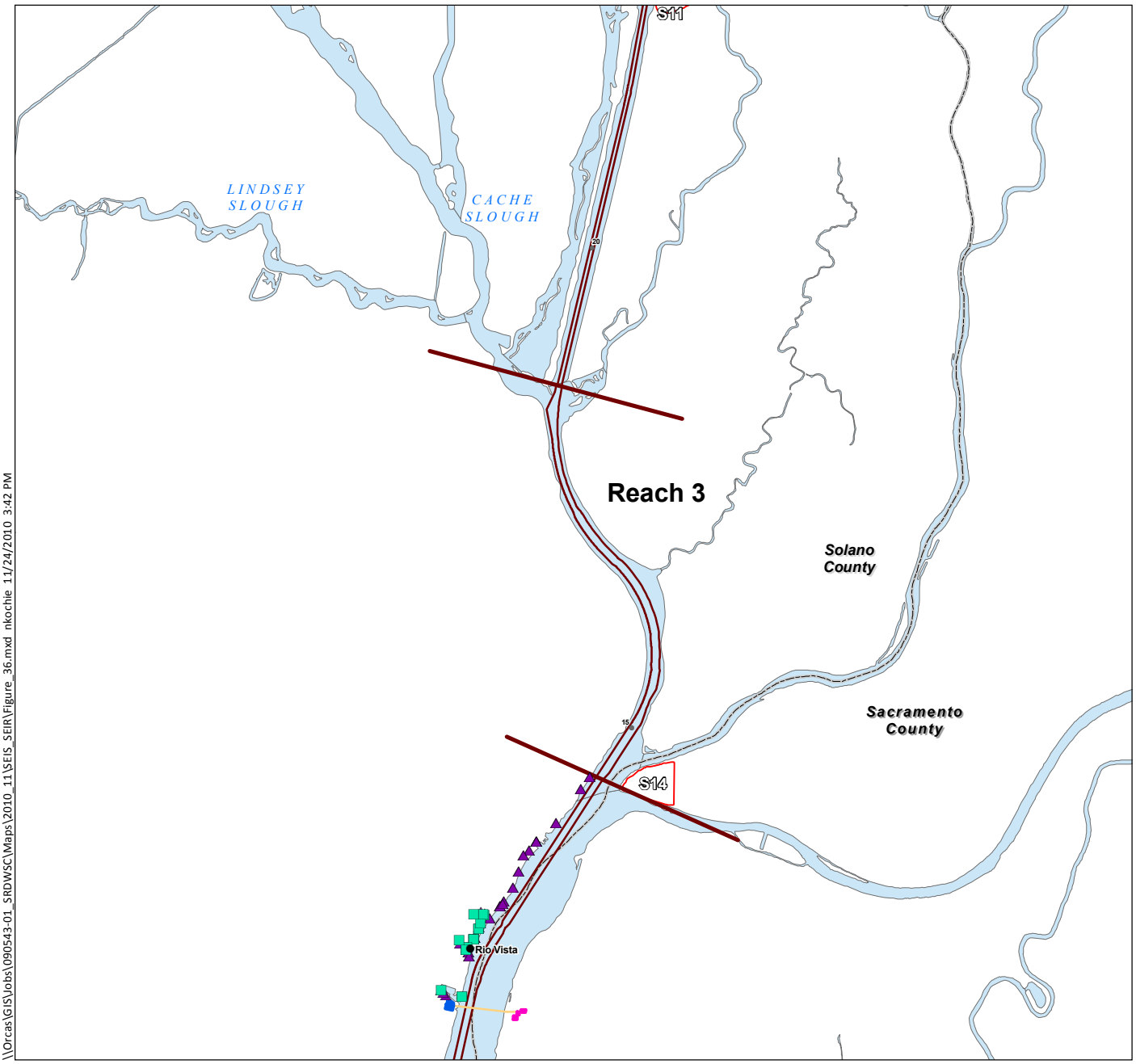
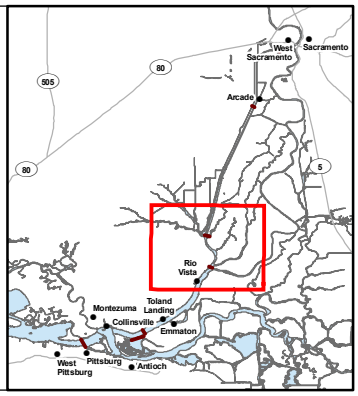
Figure 36b
Known HTRW Sites within 1,000 Feet of the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel



HTRW Site of Potential Concern (More Likely)
HTRW Site of Potential Concern (Less Likely)
Channel Proposed
Utility Line 114
Utility Line 130
Utility Line 400
Proposed Drilling
Proposed Exit
Cities
Port
Major Roads
Placement Sites
County Line
Delta/Marsh Waters



Miles
0 0.75 1.5 2.25 3

N

Figure 36c
Known HTRW Sites within 1,000 Feet of the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

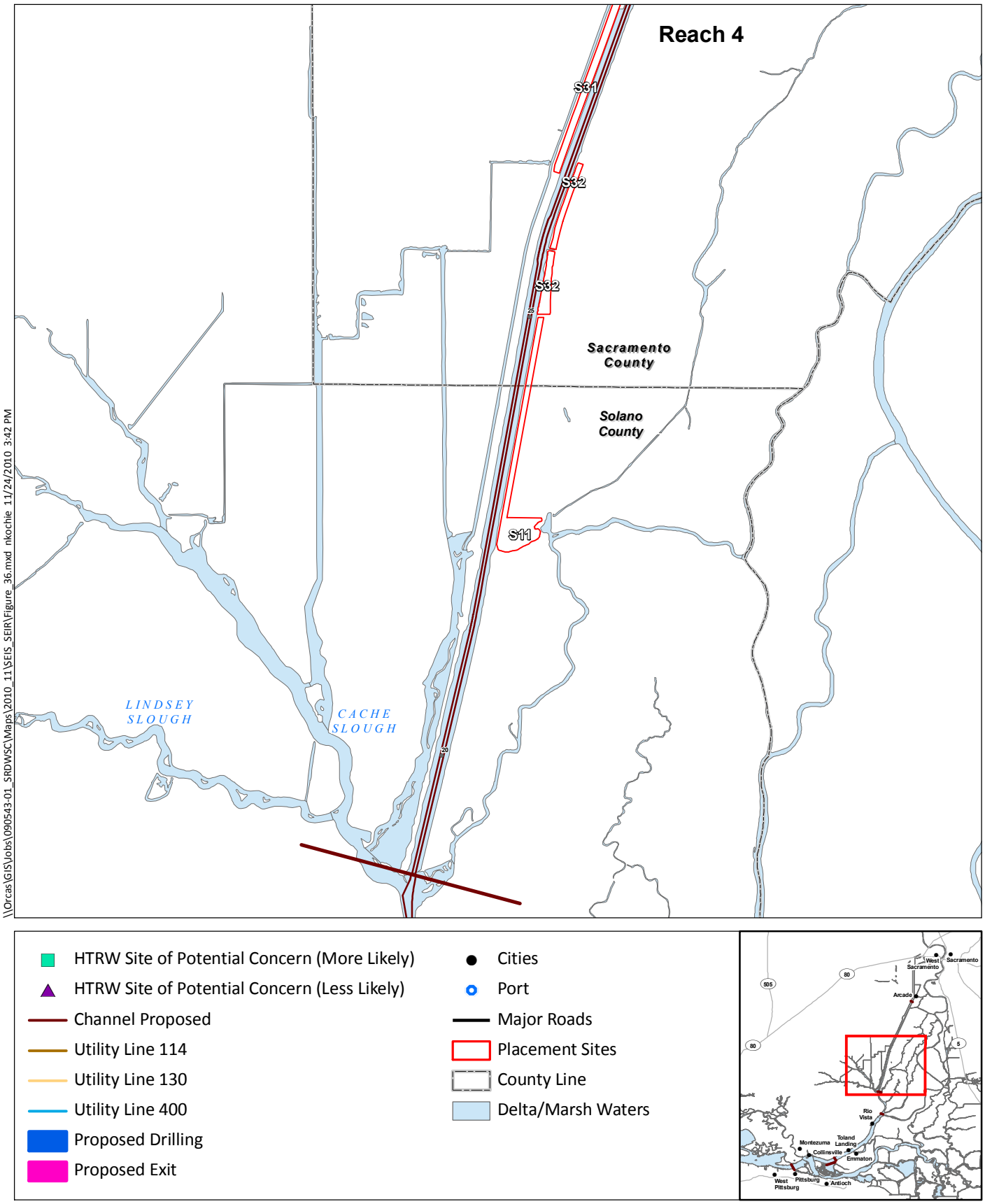


Figure 36d
Known HTRW Sites within 1,000 Feet of the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

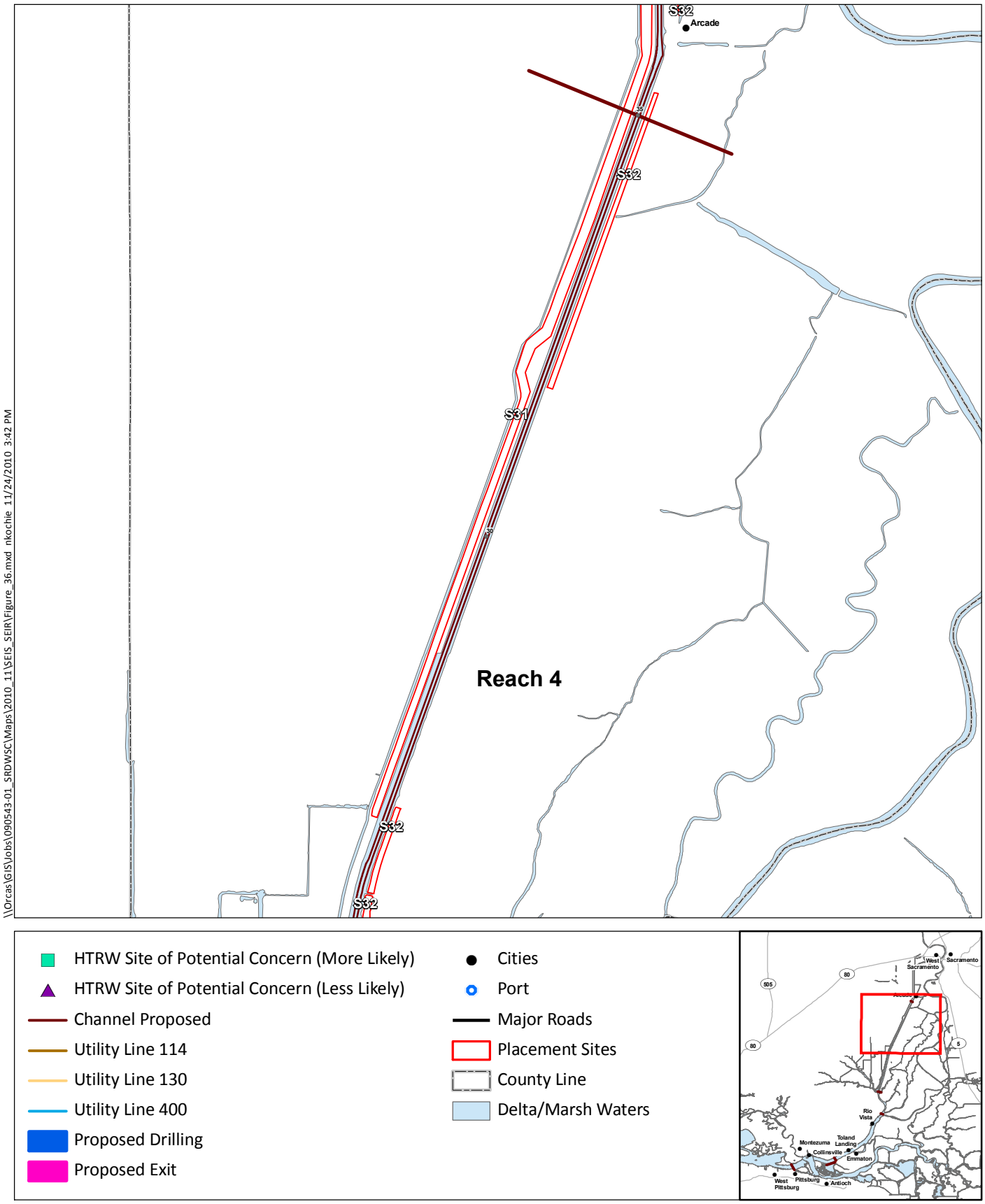


Figure 36e
Known HTRW Sites within 1,000 Feet of the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

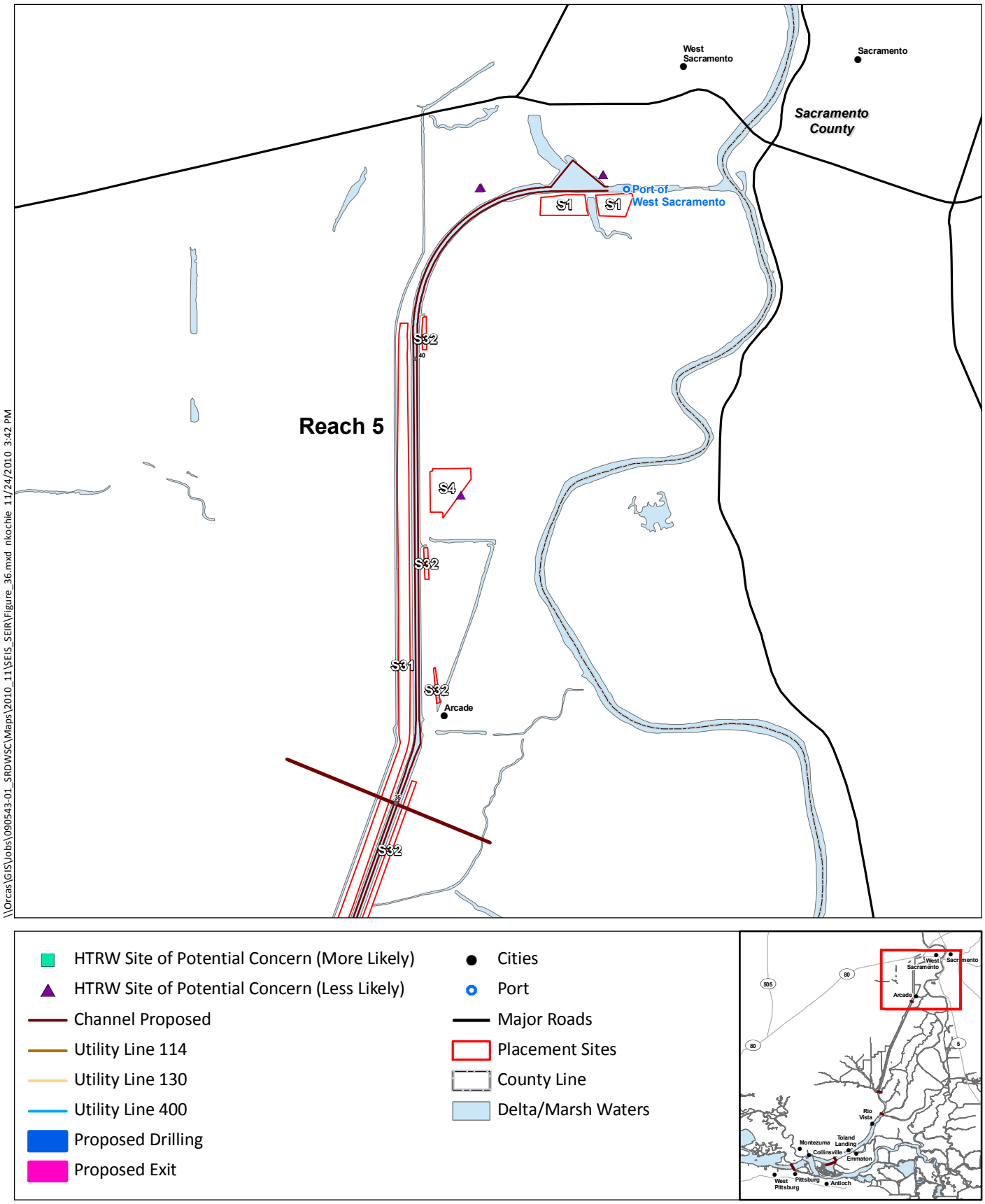


Figure 36f
Known HTRW Sites within 1,000 Feet of the Study Area
SEIS/SEIR
Sacramento River Deep Water Ship Channel

3.3.11.2 Methodology for Determining Impacts

Potential impacts to the study area from hazardous releases or storage were analyzed using a qualitative approach based on information compiled on known HTRW sites, and the changes or impacts to those sites that may occur as a result of the alternatives. Potential impacts were analyzed using professional expertise and judgment in evaluating how construction activities could impact known HTRW sites, thereby causing hazardous releases.

3.3.11.3 Threshold of Significance

An alternative could have an impact on the study area from the release or storage of HTRW if it would cause the following:

- **HTRW-1**: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment

3.3.11.4 Impacts and Mitigation Measures

HTRW-1: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment

Future without Project Conditions (NEPA and CEQA Baseline)

No known HTRW sites exist within the SRDWSC or currently used dredged material placement sites. Thus, there would be no potential for the release or storage of hazardous materials in the study area regulated under Future without Project Conditions.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

Proposed Project: Channel Deepening to -33 Feet MLLW and Selective Widening

No HTRW sites exist on any of the ten proposed dredged material placement sites. While two known HTRW sites are located within 300 feet of the PG&E's defined utility replacement upland construction access areas, PG&E would not complete any earthwork within 300 feet of the HTRW sites to ensure that there is no potential for the release of hazardous material. Thus, similar to the environmental baseline, there would be no potential for the release or storage of hazardous materials in the study area, and no significant hazard to the public or environment would occur.
Mitigation Measures: Mitigation is not required.
Residual Impact after Mitigation: None.

Channel Deepening to -33 Feet MLLW and Selective Widening Alternative

Impacts to the study area from the potential release or storage of hazardous materials from the -33 Feet MLLW Alternative would be consistent with those of the Proposed Project. Thus, as compared to the environmental baseline, there would be no potential for the release or storage of hazardous materials in the study area, and no significant hazard to the public or environment would occur as a result of the -33 Feet MLLW Alternative.

Mitigation Measures: Mitigation is not required.

Residual Impact after Mitigation: None.

3.3.11.4.1 Summary of Impacts and Mitigation Measures

Table 80 summarizes the impact determinations, mitigation measures, and residual impacts after mitigation, if applicable, for each alternative with respect to the impacts described above.

Table 80
Summary of HTRW Impacts and Mitigation Measures

Alternative	Impact	Mitigation	Residual Impact After Mitigation
HTRW-1: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment			
Future without Project Conditions (NEPA and CEQA Baseline)	No impact	None	None
Proposed Project: Channel Deepening to -35 Feet MLLW and Selective Widening	No impact	None	None
Channel Deepening to -33 Feet MLLW and Selective Widening Alternative	No impact	None	None