APPENDIX A
Alternatives Development

A.1 INTRODUCTION

Appendix A summarizes the process used to identify and screen project alternatives for the joint, draft Supplemental Environmental Impact Statement and Environmental Impact Report (Sacramento Area Voltage Support (SVS) Draft SEIS and EIR). Public involvement was used to develop and refine alternatives. Engineering considerations were the primary factor in eliminating several alternatives.

A.2 ALTERNATIVES SELECTED FOR DETAILED ANALYSIS

Western Area Power Administration (Western), Sacramento Municipal Utility District (SMUD), and the City of Roseville (Roseville) identified three transmission line segments between Western's O'Banion and SMUD's Elverta and Natomas substations for further analysis in the Draft SEIS and EIR. These would consist of Segments 1, 2, and 3. Segment 2 includes several alternative routes. Segments were screened for further consideration, primarily based on which side of the road the segment should follow. Figures 3.1-4 through 3.1-12 present segments carried forward in the Draft SEIS and EIR.

A.2.1 Segment 1 – O'Banion Substation to Cross Canal

Segment 1 was analyzed and selected as part of the Preferred Alternative in the previous Environmental Impact Statement (EIS) and Record of Decision (ROD). Segment 1 would consist of constructing about 17 miles of new double-circuit, 230-kV, transmission line adjacent to an existing transmission right-of-way (ROW), from O'Banion Substation to an area near Cross Canal. It would parallel the Sutter Bypass and cross the Feather River. Segment 1 would require about 82 new structures and 9 pulling sites, resulting in about 26 acres of short-term disturbance and 0.8 acre of long-term disturbance.

A.2.2 Segment 3 – Elverta Substation to Natomas Substation

Segment 3 was analyzed and selected as part of the Preferred Alternative in the previous EIS and ROD. For this SEIS and EIR, changes to Segment 3 include replacement of structures, conductors, and hardware. It would consist of rebuilding about 4.8 miles of the existing double-circuit, 115/230 kV transmission line within an existing ROW between Elverta and Natomas substations. This would require about 23 new structures and 3 pulling sites, resulting in about 7 acres of short-term disturbance and about 0.2 acre of long-term disturbance.

A.2.3 Segment 2 – Cross Canal to South of Elverta Substation

Three alternative alignments were considered for Segment 2: Segments 2A, 2B, and 2C. The SVS Team further divided Segment 2A into Segments 2A1, 2A2, 2A3, 2A4, and 2A5. The siting for each of the Segment 2 alternatives was based on SMUD criteria established in the Sacramento County Zoning Code, Section 301-11, for siting electrical transmission lines of 100 kV or greater (presented below). The siting criteria were assumed to apply to other counties in the study area as well as Sacramento County.

The SVS Team examined land use plans, met with county officials, and assessed the area in February 2006 to evaluate additional Segment 2 alternatives. Segments 2A1, 2A2, 2A3, 2A4, and 2A5 were selected because the alignment follows state route (SR) 99 along the east or west side, conforming to the second criteria, and then traverses five different eastern routes to connect south of Elverta Substation. Segment 2B alignment follows an abandoned railroad ROW for much of its route, conforming to the second criteria. Segments 2A1, 2A3, and 2A4 would follow arterial routes adjacent to existing agricultural uses with minor commercial development, conforming to the third criteria. Segments 2A2 and 2A5 would pass through existing farmland, conforming to the fourth criteria. Future plans in the Segment 2A area may include residential development as the city expands to adjacent land north of Elkhorn Boulevard; however, plans are in the development stage.

A.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER CONSIDERATION

Segments E1, E2, E3, and E4 were considered during alternative development but were not carried

301-11. Siting Transmission Facilities

(a) Electrical transmission lines of 100,000 volts or greater capacity may be located in any zone and shall be located in easements or ROW which permit access for maintenance with minimal disruption to surrounding properties. Preference shall be given to the location of transmission lines in the rank order specified below; every reasonable effort shall be exerted to avoid established residential areas. In the event SMUD determines that it has no alternative but to route a 100,000 volt or greater capacity transmission line through an established residential area, such lines shall be installed underground except when SMUD can demonstrate that it is not feasible to do so. "Feasible" shall be defined in California Government Code, Section 53096(c).

(1) Within existing SMUD transmission ROW or those anticipated for other projects proposed subject to this Code.

(2) Adjacent to railroads or adopted freeway routes.

(3) Along or adjacent to major arterial streets where existing or planned uses are commercial or industrial.

(4) Adjacent to or through existing or planned commercial, industrial or agricultural uses.

(5) Along arterial streets where residential uses designated in an adopted plan are RD-20 or greater density.

(6) Through areas where land uses in an adopted plan are predominately commercial, but include residential uses.

(7) Through residential areas, including side and rear yards, irrespective of density.

forward to the Draft SEIS and EIR. As noted before, these alignments were largely eliminated based on the preferred side of road or county line.

A.3.1 Segment E1 – Sacramento-Sutter County Line

The SVS Team considered aligning Segment 2A2 to proceed east from SR 99, along the south side of the Sacramento/Sutter County Line. The Natomas Basin Conservancy (TNBC) owns or has right of ownership for the majority of this route. A distribution line exists on the north side of the Sacramento/Sutter County Line; therefore, the northern corridor was preferable. TNBC is mitigation land that is part of the Sacramento Joint Vision for species of concern that include the giant garter snake, Swainson's hawk, tri-colored blackbird, and fairy shrimp. Western's analysis considered this route alternative for Segment 2A2, but decided not to move it forward for further analysis in the SEIS and EIR. Western may choose to work with TNBC as part of their mitigation effort after an alternative is chosen.

A.3.2 Segment E2 – South Side of Elkhorn Boulevard

The SVS Team considered aligning Segment 2A4 to proceed east from SR 99, along the south side of Elkhorn Boulevard. This property is currently a utility corridor used by SMUD. A storm water diversion basin is present near the east end of the alignment and a new residential community is located to the south. The design engineers determined that there was inadequate easement for a new 230-kV transmission line; therefore, this route would not be feasible from an engineering standpoint. The SVS Team analysis considered this route alternative, but decided not to move it forward for further analysis in the SEIS and EIR, based on the engineering constraints. Western will evaluate the north side of Elkhorn Boulevard (Segment 2A4) in the SEIS and EIR.

A.3.3 Segment E3 – Existing Railroad Corridor

The SVS Team considered aligning Segment 2B to proceed along the abandoned railroad ROW south to Sankey Road, and then to parallel the existing railroad ROW. The design engineers determined that there was inadequate easement for the new 230-kV transmission line; therefore, this route would

not be feasible from an engineering standpoint. Western's analysis considered this route alternative, but decided not to move it forward for further analysis in the SEIS and EIR, based on engineering constraints. Western will evaluate an abandoned railroad (Segment 2B) in the SEIS and EIR.

A.3.4 Segment E4 – East Side of East Levee Road

The SVS Team considered aligning Segments 2A1 and 2A2 along the east side of East Levee Road. A floodway was observed along this side of the roadway and design engineers determined that there was inadequate easement for the new 230-kV transmission line outside of wetted areas; therefore, this route would not be feasible from an engineering standpoint. Western's analysis considered this route alternative, but decided not to move it forward for further analysis, based on engineering constraints in the SEIS and EIR.

APPENDIX B
Calculations of Disturbances For Each Segment and Alternative

Table B-1 presents acreages of disturbance for each segment and alternative. Transmission line miles were obtained from Figures 3.1-4 to 3.1-12. The number of structures was calculated by assuming a structure spacing of 1,100 feet. Detailed designs have not been completed for the proposed Project; therefore, 15-foot-wide access roads were assumed to be constructed along the along the entire length of new ROW. New access roads would not be constructed along portions of Segment $2C_1$ and all of Segment 3 because access roads already exist. Pulling site construction was assumed every 3 miles, with 0.4-acre short-term disturbance per site. Material storage yard construction was assumed every 15 miles, with 5 acres of disturbance per yard. Pulling sites and material storage yard disturbances were assumed to be construction-related and short term because the areas would be returned to preconstruction conditions following project construction. Each structure was assumed to have a short-term disturbance of 0.23 acre (100 by 100 feet) and a long-term disturbance of 0.01 acre (10 by 10 feet, conservatively rounded up).

Total short- and long-term disturbances were summed for each segment in Table B-1. Disturbances for specific land uses, habitat types, and floodplains were measured from specific figures in each section and maps from Appendix C. Disturbances were calculated for each segment in Table B-1 as described below.

B.1 PRIME AND UNIQUE FARMLAND

Construction of structures, access roads, pulling sites, and material storage yards was assumed to disturb prime and unique farmland during construction. The presence of structures and access roads was assumed to disturb prime and unique farmland for the long term. Acreage was measured from Figure 4.9-4 and disturbances were calculated as follows:

- Construction/short-term disturbance: (miles of prime and unique farmland) ÷ (segment length) x (total construction disturbance); and
- Long-term: (miles of prime and unique farmland) ÷ (segment length) x (total long-term disturbance).

B.2 RICE FIELDS

Construction of structures, access roads, and pulling sites was assumed to disturb rice fields during construction. The presence of structures and access roads was assumed to disturb rice fields for the long term. Acreage was measured from Appendix C maps and disturbances were calculated as follows:

- Construction/short-term disturbance: (acres of rice fields) ÷ (acres of segment) x (construction access road + structures + pulling-site disturbances); and
- Long-term disturbance: (acres rice fields) ÷ (acres of segment) x (total long-term disturbance).

B.3 RIVERINE/RIPARIAN

Construction of structures, access roads, and pulling sites was assumed to disturb riverine/riparian habitat during construction. The presence of structures and access roads was assumed to disturb riverine/riparian habitat for the long term. Acreage was measured from Appendix C maps and disturbances were calculated as follows:

- Construction/short-term disturbance: (acres of riverine habitat) ÷ (acres of segment) x (construction access road + structures + pulling-site disturbances); and
- Long-term disturbance: (acres riverine habitat) ÷ (acres of segment) x (total long-term disturbance).

B.4 VERNAL POOLS

Construction of structures and access roads was assumed to disturb vernal pool habitat during construction. The presence of structures and access roads was assumed to disturb vernal pool habitat for the long term. Acreage was measured from Appendix C maps and disturbances were calculated as follows:

- Construction/short-term disturbance: (acres of vernal pools) ÷ (acres of segment) x (construction access road + structures); and
- Long-term disturbance: (acres riverine habitat) ÷ (acres of segment) x (total long-term disturbance).

B.5 EMERGENT WETLANDS

Construction of structures and access roads was assumed to disturb emergent wetlands during construction. The presence of structures and access roads was assumed to disturb emergent wetlands for the long term. Acreage was measured from Appendix C maps and disturbances were calculated as follows:

- Construction/short-term disturbance: (acres of emergent wetlands) ÷ (acres of segment) x (construction access road + structures); and
- Long-term disturbance: (acres emergent wetlands) ÷ (acres of segment) x (total long-term disturbance).

B.6 FLOODPLAINS

Construction of structures, access roads, pulling sites, and material storage yards was assumed to disturb floodplains during construction. The presence of structures and access roads was assumed to disturb floodplains for the long term. Acreage was measured from Figure 4.6-1 and disturbances were calculated as follows:

- Construction/short-term: (miles of 100- or 500-year floodplain) ÷ (segment length) **x** (total construction disturbance); and
- Long-term: (miles of 100- or 500-year floodplain) ÷ (segment length) **x** (total long-term disturbance).

B.7 PROPOSED DEVELOPMENT, SPECIFIC PLANS, AND HABITAT CONSERVATION AREAS

Proposed development acreage was taken from Figure 4.9-3 and was assumed to disturb development for the long term along the entire right-of-way width.

Table B-1. Summary of New Disturbances and Impacts to Various Resources

			DISTURBANCE BY FACILITY/ACTIVITY												DISTURBANCE TO RESOURCES																							
			New Structures[a]			Access Roads[b]			Pulling Sites[c]		Material Storage[d]				Prime & Unique Farmland			Rice			Riverine/Riparian			Vernal pools, etc.			Emergent Wetlands			Floodplains						Planned Development	
	Total Miles	Segment Total ROW Acres	Number	Construction Acres	Long-Term Acres	Miles	Construction Acres	Long-Term Acres	Number	Construction Acres	No.	Construction Acres	Total Construction Acres	Total Long-Term Acres	Total Miles	Construction Acres	Long-Term Acres	Total Rice Acres	Construction Acres	Long-Term Acres	Total Acres	Construction Acres	Long-Term Acres	Total Acres	Construction Acres	Long-Term Acres	Total Acres	Construction Acres	Long-Term Acres	100-Year Total Acres	Construction Acres	Long-Term Acres	500-year Total Acres	Construction Acres	Long-Term Acres	Long-Term Acres
SEGMENT																																					
1	17.1	259.1	82	18.9	0.8	17.1	31.1	31.1	6	2.4	1	5.0	57.4	31.9	9.5	31.9	17.7	145.1	29.3	17.9	8.2	1.6	1.0	0.0	0.0	0.0	8.0	1.5	1.0	13.4	3.0	1.65	245.2	54.3	30.2	0.0
2A1-East	11.7	177.3	56	12.9	0.6	11.7	21.3	21.3	4	1.6	1	5.0	40.8	21.9	3.7	12.9	6.9	125.2	25.3	15.4	2.7	0.5	0.3	0.8	0.2	0.1	0.0	0.0	0.0	167	38.3	20.6	11.0	2.5	1.4	150.7
2A1-West	11.9	180.3	57	13.1	0.6	11.9	21.6	21.6	4	1.6	1	5.0	41.4	22.2	4.3	15.0	8.0	138.0	27.8	17.0	2.5	0.5	0.3	0.8	0.2	0.1	0.0	0.0	0.0	177	40.6	21.8	11.0	2.5	1.4	112.8
2A2-East	11.6	175.7	56	12.8	0.6	11.6	21.1	21.1	4	1.6	1	5.0	40.5	21.7	3.8	13.3	7.1	115.5	23.3	14.3	2.7	0.5	0.3	0.8	0.2	0.1	0.0	0.0	0.0	165	38.0	20.4	11.0	2.5	1.4	154.5
2A2-West	11.8	178.8	57	13.0	0.6	11.8	21.5	21.5	4	1.6	1	5.0	41.1	22.0	4.8	16.7	9.0	130.0	26.2	16.0	2.5	0.5	0.3	0.8	0.2	0.1	0.0	0.0	0.0	175	40.2	21.6	11.0	2.5	1.4	116.6
2A3-East	11.9	180.3	57	13.1	0.6	11.9	21.6	21.6	4	1.6	1	5.0	41.4	22.2	6.6	22.9	12.3	136.0	27.4	16.8	1.7	0.3	0.2	6.0	1.2	0.7	0.0	0.0	0.0	169	38.9	20.9	11.0	2.5	1.4	153.8
2A3-West	12.1	183.3	58	13.4	0.6	12.1	22.0	22.0	4	1.6	1	5.0	42.0	22.6	7.7	26.7	14.4	147.0	29.6	18.1	1.5	0.3	0.2	6.0	1.2	0.7	0.0	0.0	0.0	179	41.0	22.0	11.0	2.5	1.4	115.9
2A4-East	13.3	201.5	64	14.7	0.6	13.3	24.2	24.2	4	1.6	1	5.0	45.5	24.8	7.9	27.0	14.7	127.2	25.5	15.6	1.7	0.3	0.2	0.2	0.04	0.02	0.0	0.0	0.0	190	42.9	23.4	11.9	2.7	1.5	172.7
2A4-West	13.5	204.5	65	14.9	0.6	13.5	24.5	24.5	5	2.0	1	5.0	46.4	25.2	9.1	31.3	17.0	132.0	26.8	16.3	1.5	0.3	0.2	0.2	0.04	0.02	0.0	0.0	0.0	200	45.4	24.6	11.9	2.7	1.5	106.0
2A5-East	11.8	178.8	57	13.0	0.6	11.8	21.5	21.5	4	1.6	1	5.0	41.1	22.1	5.6	19.5	10.5	134.7	27.2	16.6	1.7	0.3	0.2	0.5	0.1	0.1	0.0	0.0	0.0	169	38.8	20.8	11.0	2.5	1.4	150.7
2A5-West	12.0	181.8	58	13.2	0.6	12.0	21.8	21.8	4	1.6	1	5.0	41.7	22.4	6.7	23.3	12.5	152.0	30.7	18.7	1.5	0.3	0.2	0.5	0.1	0.1	0.0	0.0	0.0	179	41.0	22.0	11.0	2.5	1.4	112.8
2B	9.4	142.4	45	10.4	0.5	9.4	17.1	17.1	3	1.2	1	5.0	33.7	17.5	0.3	1.1	0.6	17.6	3.5	2.2	2.6	0.5	0.3	7.9	1.5	1.0	11.4	2.2	1.4	106	25.0	13.0	2.5	0.6	0.3	26.5
2C	15.7	237.9	75	17.3	0.8	6.3	11.5	11.5	5	2.0	1	5.0	35.8	12.2	5.3	12.1	4.1	90.9	11.8	4.7	1.4	0.2	0.1	8.6	1.0	0.4	2.7	0.3	0.1	76.7	11.5	3.9	5.7	0.9	0.3	47.7
3	4.8	72.7	23	5.3	0.2	0.0	0.0	0.0	2	0.8	0	0.0	6.1	0.2	0.3	0.4	0.01	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.2	0.01	0.1	0.0	0.0	65.5	5.5	0.2	1.7	0.1	0.005	51.5
ALTERNATIVE																																					
A1-East	33.6	509.1	161	37.1	1.6	28.8	52.4	52.4	12	4.8	2	10.0	104.3	54	13.5	45.2	24.7	270.3	54.6	33.3	10.9	2.1	1.3	4.0	0.4	0.1	8.1	1.6	1.0	245.5	46.8	22.4	257.9	57.0	31.6	202.2
A1-West	33.8	512.1	162	37.3	1.6	29.0	52.7	52.7	12	4.8	2	10.0	104.8	54.3	14.1	47.2	25.8	283.1	57.2	34.9	10.7	2.1	1.3	4.0	0.4	0.1	8.1	1.6	1.0	255.9	49.1	23.7	257.9	57.0	31.6	164.3
A2-East	33.5	507.6	161	37.0	1.6	28.7	52.2	52.2	12	4.8	2	10.0	104.0	53.8	13.6	45.6	24.8	260.6	52.7	32.1	10.9	2.1	1.3	4.0	0.4	0.1	8.1	1.6	1.0	244.0	46.5	22.2	257.9	57.0	31.6	206.0
A2-West	33.7	510.6	162	37.2	1.6	28.9	52.5	52.5	12	4.8	2	10.0	104.6	54.2	14.6	49.0	26.7	275.1	55.6	33.9	10.7	2.1	1.3	4.0	0.4	0.1	8.1	1.6	1.0	253.9	48.7	23.4	257.9	57.0	31.6	168.1
A3-East	33.8	512.1	162	37.3	1.6	29.0	52.7	52.7	12	4.8	2	10.0	104.8	54.4	16.4	55.2	30.1	281.1	56.8	34.6	9.9	1.9	1.2	9.2	1.4	0.8	8.1	1.6	1.0	248.2	47.3	22.7	257.9	57.0	31.6	205.3
A3-West	34.0	515.1	163	37.5	1.6	29.2	53.1	53.1	12	4.8	2	10.0	105.4	54.7	17.5	59.0	32.1	292.1	59.0	36.0	9.7	1.9	1.2	9.2	1.4	0.7	8.1	1.6	1.0	257.9	49.4	23.9	257.9	57.0	31.6	167.4
A4-East	35.2	533.3	169	38.9	1.7	30.4	55.3	55.3	12	4.8	2	10.0	108.9	56.9	17.7	59.3	32.5	272.3	54.9	33.5	9.9	1.9	1.2	3.4	0.3	0.0	8.1	1.6	1.0	269.1	51.4	25.3	258.8	57.1	31.7	224.2
A4-West	35.4	536.3	170	39.1	1.7	30.6	55.6	55.6	13	5.2	2	10.0	109.9	57.3	18.9	63.6	34.7	277.1	56.1	34.1	9.7	1.9	1.2	3.4	0.3	0.0	8.1	1.6	1.0	278.9	53.9	26.5	258.8	57.1	31.7	157.5

			DISTURBANCE BY FACILITY/ACTIVITY												DISTURBANCE TO RESOURCES																							
			New Structures[a]			Access Roads[b]			Pulling Sites[c]		Material Storage[d]				Prime & Unique Farmland			Rice			Riverine/Riparian			Vernal pools, etc.			Emergent Wetlands			Floodplains						Planned Development
	Total Miles	Segment Total ROW Acres	Number	Construction Acres	Long-Term Acres	Miles	Construction Acres	Long-Term Acres	Number	Construction Acres	No.	Construction Acres	Total Construction Acres	Total Long-Term Acres	Total Miles	Construction Acres	Long-Term Acres	Total Rice Acres	Construction Acres	Long-Term Acres	Total Acres	Construction Acres	Long-Term Acres	Total Acres	Construction Acres	Long-Term Acres	Total Acres	Construction Acres	Long-Term Acres	100-Year Total Acres	Construction Acres	Long-Term Acres	500-year Total Acres	Construction Acres	Long-Term Acres	Long-Term Acres
A5-East	33.7	510.6	162	37.2	1.6	28.9	52.5	52.5	12	4.8	2	10.0	104.6	54.2	15.4	51.8	28.2	279.8	56.5	34.5	9.9	1.9	1.2	3.7	0.3	0.1	8.1	1.6	1.0	247.6	47.2	22.7	257.9	57.0	31.6	202.2
A5-West	33.9	513.6	163	37.4	1.6	29.1	52.9	52.9	12	4.8	2	10.0	105.1	54.5	16.5	55.6	30.2	297.1	60.0	36.6	9.7	1.9	1.2	3.7	0.3	0.1	8.1	1.6	1.0	257.9	49.5	23.9	257.9	57.0	31.6	164.3
B	31.3	474.2	150	34.6	1.5	26.5	48.2	48.2	11	4.4	2	10.0	97.1	49.7	10.1	33.4	18.3	162.7	32.9	20.0	10.8	2.1	1.3	11.1	1.8	1.0	19.5	3.7	2.4	184.6	33.5	14.9	249.4	55.0	30.5	78.0
C	37.6	569.7	180	41.5	1.8	23.4	42.5	42.5	13	5.2	2	10.0	99.3	44.4	15.1	44.4	21.9	236.0	41.1	22.5	9.6	1.8	1.1	11.8	1.3	0.5	10.8	1.9	1.1	155.6	20.0	5.8	252.6	55.3	30.5	99.2
No Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: Burleson 2007

[a] Structure Assumptions
Assume a new structure every 1,100 feet
Assume 0.23 short-term acre disturbance for each structure
Assume 0.01 long-term acre disturbance for each structure

[b] Access Road Assumptions
Assume no disturbance for Segment 3 access road because it is in existing Right-of-Way
Assume access roads parallel to transmission lines for Segments 1, 2A1, 2A2, 2A3, 2A4, 2A5, and 2B
Assume 6.3 miles of new access road for 2C portion (9.4 miles is along existing ROW).
Assume 15-foot width for access roads
Assume road disturbance acres for long- and short-term = miles*5280*15'width\43560

[c] Assume a pulling site every three miles short-term disturbance of 0.4 acre per site

[d] Assume materials storage yard every 15 miles and short-term disturbance of 5 acres per site

Sacramento Area Voltage Support Supplemental EIS and EIR

Aerial Photographs for Routes

Segment 1

Map C-1

Land Use Categories

- Agriculture
- Grain
- Orchard
- Pasture
- Row Crop
- Rice
- Barren
- Commercial
- Non-Native Grassland
- Meadow
- Riparian, Great Valley Forest
- Riparian, Great Valley Scrub
- Urban
- Perennial Creek
- Canal
- Pond
- River
- Wetland, Freshwater Marsh
- Seasonal Wetland
- Wetland Swale
- Vernal Pool Grassland
- Vernal Pool Isolate

Water Habitat

- Intermittent Creek
- Perennial Creek
- Ditch
- Canal
- Culvert

Species

- Burrowing Owl
- Red-Tailed Hawk
- Elderberry

- Highway
- Road
- Existing Transmission Line
- Substation

Department of Fish and Game

- Wildlife Area
- Significant Area
- 1 Mile Post

N

1,500 750 0 1,500

Feet

OFFICIAL USE ONLY

May be exempt from public release under the Freedom of Information Act (5 U.S.C.552) Exemption 2 - Circumvention of statute.

Western review required before public release.

Name/Org: Burleson Consulting Date: 4/23/2007

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California Spatial Information Library

Surveys Completed by Western: 2005, 2006

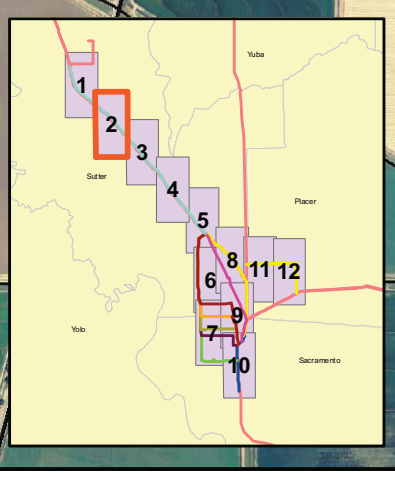
Sacramento Area Voltage Support Supplemental EIS and EIR

Aerial Photographs for Routes

Segment 1

Map C-2

Segment 1
4
5
6
7
State Hwy 113
Everglade Rd
O'Banion - Elverta #2
O'Banion - Elverta #1
Sutter Bypass
Pelger Rd
Subaco Rd
East Canal
Armour Rd



Land Use Categories

- Agriculture
- Grain
- Orchard
- Pasture
- Row Crop
- Rice
- Barren
- Commercial
- Non-Native Grassland
- Meadow
- Riparian, Great Valley Forest
- Riparian, Great Valley Scrub
- Urban
- Perennial Creek
- Canal
- Pond
- River
- Wetland, Freshwater Marsh
- Seasonal Wetland
- Wetland Swale
- Vernal Pool Grassland
- Vernal Pool Isolate

Water Habitat

- Intermittent Creek
- Perennial Creek
- Ditch
- Canal
- Culvert

Species

- Burrowing Owl
- Red-Tailed Hawk
- Elderberry

- Highway
- Road
- Existing Transmission Line
- Substation

Department of Fish and Game

- Wildlife Area
- Significant Area
- 1 Mile Post

N

1,500 750 0 1,500

Feet

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California Spatial Information Library

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Sacramento Area Voltage Support Supplemental EIS and EIR

Aerial Photographs for Routes

Segment 1

Map C-3

Land Use Categories

- Agriculture
- Grain
- Orchard
- Pasture
- Row Crop
- Rice
- Barren
- Commercial
- Non-Native Grassland
- Meadow
- Riparian, Great Valley Forest
- Riparian, Great Valley Scrub
- Urban
- Perennial Creek
- Canal
- Pond
- River
- Wetland, Freshwater Marsh
- Seasonal Wetland
- Wetland Swale
- Vernal Pool Grassland
- Vernal Pool Isolate

Water Habitat

- Intermittent Creek
- Perennial Creek
- Ditch
- Canal
- Culvert

Species

- Burrowing Owl
- Red-Tailed Hawk
- Elderberry

- Highway
- Road
- Existing Transmission Line
- Substation

Department of Fish and Game

- Wildlife Area
- Significant Area

1 Mile Post

N

1,500 750 0 1,500

Feet

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California Spatial Information Library

Surveys Completed by Western: 2005, 2006

Marcuse Rd
State Hwy 99
Cypress Ave
Sawtelle Ave
Segment 1
Oak Ave
8
Laurel Ave
9
O'Banion - Elverta #2
10
O'Banion - Elverta #1
Sacramento Ave
Sutter Bypass
Garden Hwy
Yuba
Sutter
Placer
Yolo
Sacramento
1
2
3
4
5
6
7
8
9
10
11
12

Sacramento Area Voltage Support Supplemental EIS and EIR

Aerial Photographs for Routes

Segment 1

Map C-4

Land Use Categories

- Agriculture
- Grain
- Orchard
- Pasture
- Row Crop
- Rice
- Barren
- Commercial
- Non-Native Grassland
- Meadow
- Riparian, Great Valley Forest
- Riparian, Great Valley Scrub
- Urban
- Perennial Creek
- Canal
- Pond
- River
- Wetland, Freshwater Marsh
- Seasonal Wetland
- Wetland Swale
- Vernal Pool Grassland
- Vernal Pool Isolate

Water Habitat

- Intermittent Creek
- Perennial Creek
- Ditch
- Canal
- Culvert

Species

- Burrowing Owl
- Red-Tailed Hawk
- Elderberry

- Highway
- Road
- Existing Transmission Line
- Substation

Department of Fish and Game

- Wildlife Area
- Significant Area
- 1 Mile Post

N

1,500 750 0 1,500

Feet

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California Spatial Information Library

Surveys Completed by Western: 2005, 2006

Sacramento Area Voltage Support Supplemental EIS and EIR

Aerial Photographs for Routes

Segments 1, 2A1, 2A2, 2A3, 2A4, 2A5, 2B, 2C$_1$

Map C-5

Land Use Categories

- Agriculture
- Grain
- Orchard
- Pasture
- Row Crop
- Rice
- Barren
- Commercial
- Non-Native Grassland
- Meadow
- Riparian, Great Valley Forest
- Riparian, Great Valley Scrub
- Urban
- Perennial Creek
- Canal
- Pond
- River
- Wetland, Freshwater Marsh
- Seasonal Wetland
- Wetland Swale
- Vernal Pool Grassland
- Vernal Pool Isolate

Water Habitat

- Intermittent Creek
- Perennial Creek
- Ditch
- Canal
- Culvert

Species

- Burrowing Owl
- Red-Tailed Hawk
- Elderberry

- Highway
- Road
- Existing Transmission Line
- Substation

Department of Fish and Game

- Wildlife Area
- Significant Area

1 Mile Post

N

1,500 750 0 1,500

Feet

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California Spatial Information Library

Surveys Completed by Western: 2005, 2006

Sacramento Area Voltage Support Supplemental EIS and EIR

Aerial Photographs for Routes

Segments 2A1, 2A2, 2A3, 2A4, 2A5, 2B, 2C$_1$

Map C-6

Land Use Categories

- Agriculture
- Grain
- Orchard
- Pasture
- Row Crop
- Rice
- Barren
- Commercial
- Non-Native Grassland
- Meadow
- Riparian, Great Valley Forest
- Riparian, Great Valley Scrub
- Urban
- Perennial Creek
- Canal
- Pond
- River
- Wetland, Freshwater Marsh
- Seasonal Wetland
- Wetland Swale
- Vernal Pool Grassland
- Vernal Pool Isolate

Water Habitat

- Intermittent Creek
- Perennial Creek
- Ditch
- Canal
- Culvert

Species

- Burrowing Owl
- Red-Tailed Hawk
- Elderberry

- Highway
- Road
- Existing Transmission Line
- Substation

Department of Fish and Game

- Wildlife Area
- Significant Area
- 1 Mile Post

N

1,500 750 0 1,500

Feet

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California Spatial Information Library

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Sacramento Area Voltage Support Supplemental EIS and EIR

Aerial Photographs for Routes

Segments 2A1, 2A2, 2A3, 2A4, 2A5

Map C-7

Segment 2A1
Segment 2A2
Segment 2A3
Segment 2A4
Segment 2A5
2A West Option
2A East Option
Map C-9>
Map C-10>

Land Use Categories

- Agriculture
- Grain
- Orchard
- Pasture
- Row Crop
- Rice
- Barren
- Commercial
- Non-Native Grassland
- Meadow
- Riparian, Great Valley Forest
- Riparian, Great Valley Scrub
- Urban
- Perennial Creek
- Canal
- Pond
- River
- Wetland, Freshwater Marsh
- Seasonal Wetland
- Wetland Swale
- Vernal Pool Grassland
- Vernal Pool Isolate

Water Habitat

- Intermittent Creek
- Perennial Creek
- Ditch
- Canal
- Culvert

Species

- Burrowing Owl
- Red-Tailed Hawk
- Elderberry

- Highway
- Road
- Existing Transmission Line
- Substation

Department of Fish and Game

- Wildlife Area
- Significant Area

1 Mile Post

N

1,500 750 0 1,500

Feet

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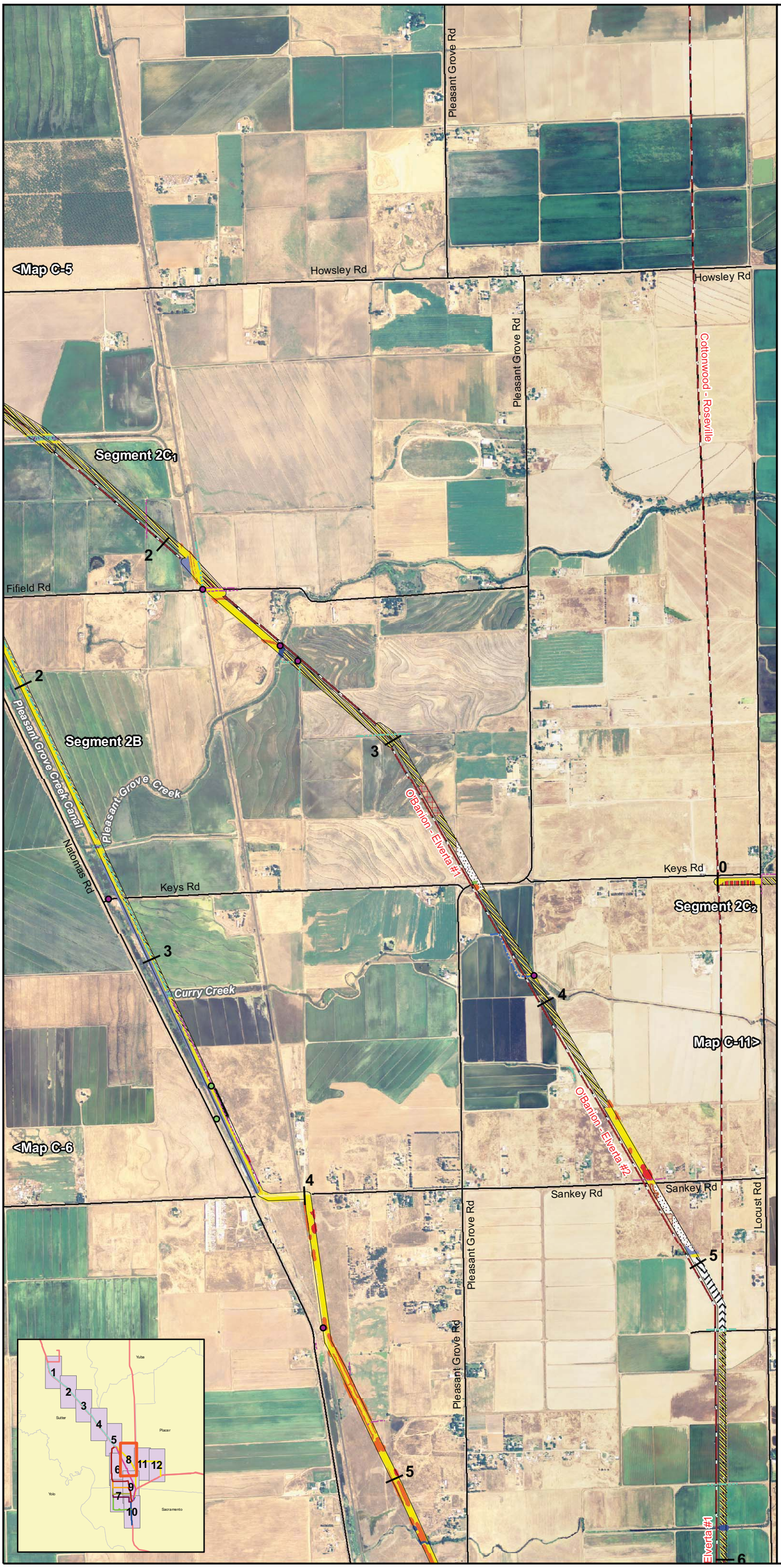
Sacramento Area Voltage Support Supplemental EIS and EIR

Aerial Photographs for Routes

Segments 2B, $2C_1$, $2C_2$

Map C-8



Land Use Categories

- Agriculture
- Grain
- Orchard
- Pasture
- Row Crop
- Rice
- Barren
- Commercial
- Non-Native Grassland
- Meadow
- Riparian, Great Valley Forest
- Riparian, Great Valley Scrub
- Urban
- Perennial Creek
- Canal
- Pond
- River
- Wetland, Freshwater Marsh
- Seasonal Wetland
- Wetland Swale
- Vernal Pool Grassland
- Vernal Pool Isolate

Water Habitat

- Intermittent Creek
- Perennial Creek
- Ditch
- Canal
- Culvert

Species

- Burrowing Owl
- Red-Tailed Hawk
- Elderberry

- Highway
- Road
- Existing Transmission Line
- Substation

Department of Fish and Game

- Wildlife Area
- Significant Area

1 Mile Post

N

1,500 750 0 1,500

Feet

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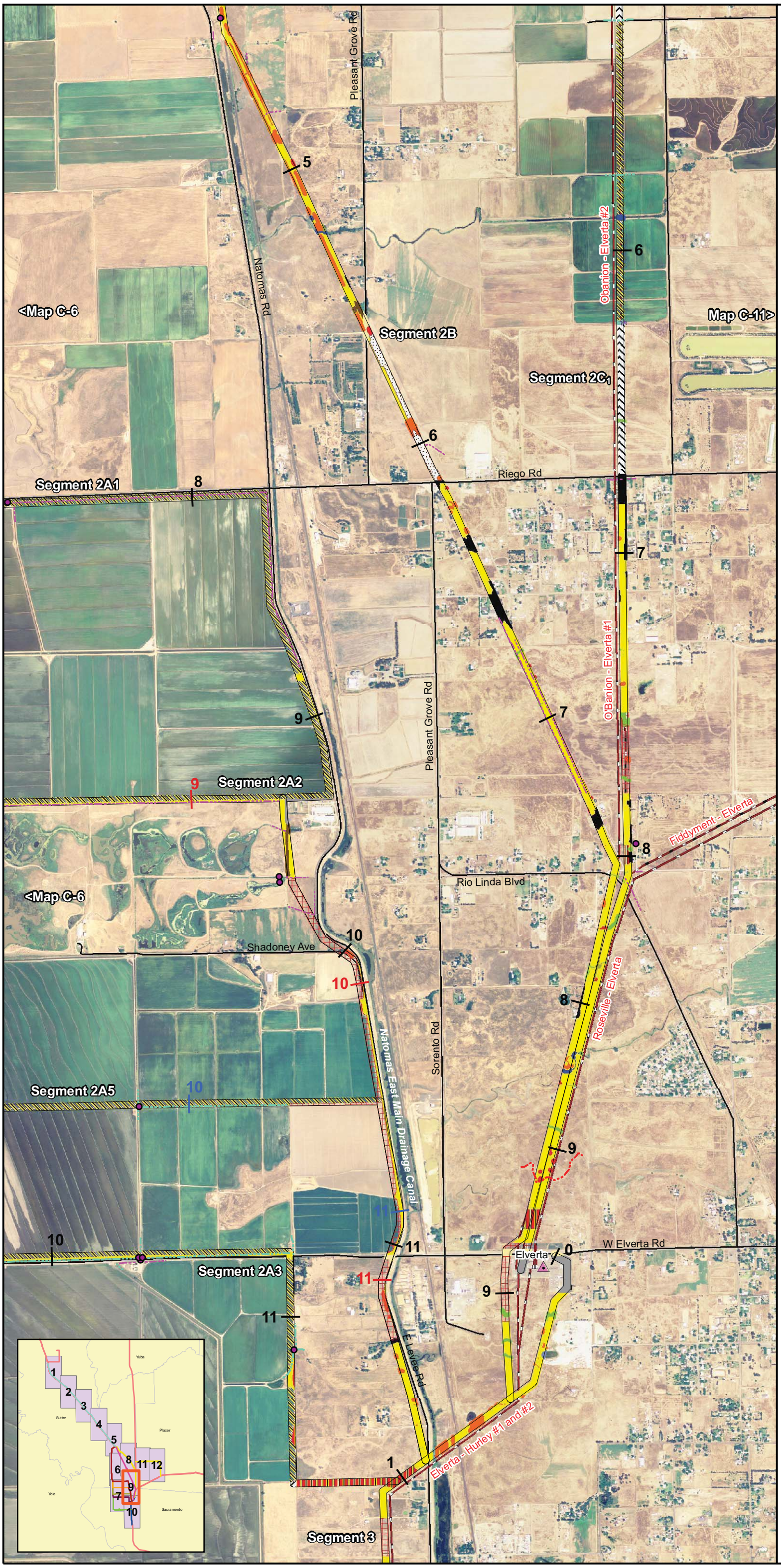
Sacramento Area Voltage Support Supplemental EIS and EIR

Aerial Photographs for Routes

Segments 2A1, 2A2, 2A3, 2A5, 2B, 2C$_1$, 3

Map C-9



Land Use Categories

- Agriculture
- Grain
- Orchard
- Pasture
- Row Crop
- Rice
- Barren
- Commercial
- Non-Native Grassland
- Meadow
- Riparian, Great Valley Forest
- Riparian, Great Valley Scrub
- Urban
- Perennial Creek
- Canal
- Pond
- River
- Wetland, Freshwater Marsh
- Seasonal Wetland
- Wetland Swale
- Vernal Pool Grassland
- Vernal Pool Isolate

Water Habitat

- Intermittent Creek
- Perennial Creek
- Ditch
- Canal
- Culvert

Species

- Burrowing Owl
- Red-Tailed Hawk
- Elderberry

- Highway
- Road
- Existing Transmission Line
- Substation

Department of Fish and Game

- Wildlife Area
- Significant Area

1 Mile Post

N

1,500 750 0 1,500

Feet

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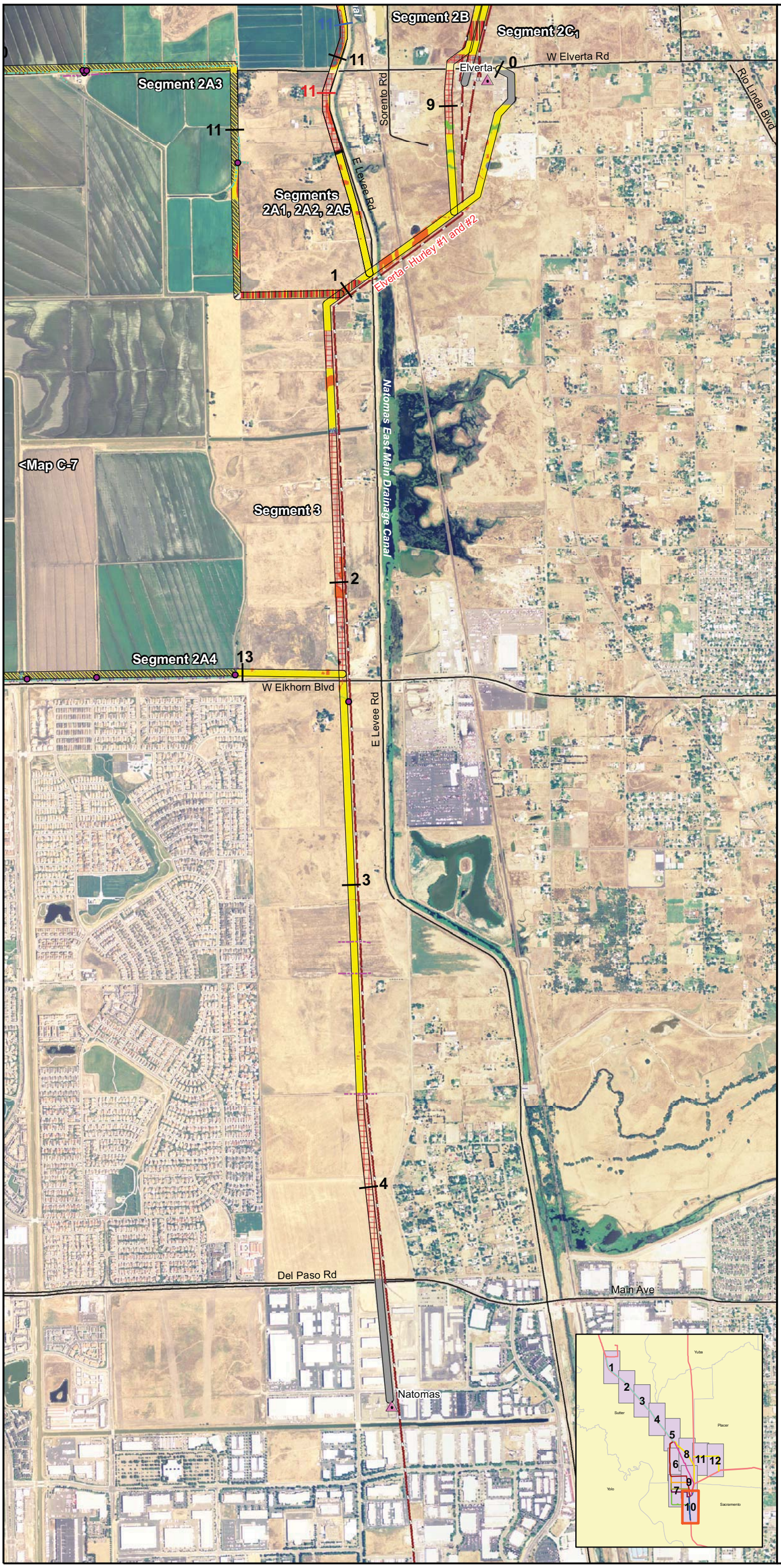
Sacramento Area Voltage Support Supplemental EIS and EIR

Aerial Photographs for Routes

Segments 2A1, 2A2, 2A3, 2A4, 2A5, 2B, $2C_1$, $2C_2$, 3

Map C-10



Land Use Categories

- Agriculture
- Grain
- Orchard
- Pasture
- Row Crop
- Rice
- Barren
- Commercial
- Non-Native Grassland
- Meadow
- Riparian, Great Valley Forest
- Riparian, Great Valley Scrub
- Urban
- Perennial Creek
- Canal
- Pond
- River
- Wetland, Freshwater Marsh
- Seasonal Wetland
- Wetland Swale
- Vernal Pool Grassland
- Vernal Pool Isolate

Water Habitat

- Intermittent Creek
- Perennial Creek
- Ditch
- Canal
- Culvert

Species

- Burrowing Owl
- Red-Tailed Hawk
- Elderberry

- Highway
- Road
- Existing Transmission Line
- Substation

Department of Fish and Game

- Wildlife Area
- Significant Area

1 Mile Post

N

1,500 750 0 1,500

Feet

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Sacramento Area Voltage Support Supplemental EIS and EIR

Aerial Photographs for Routes

Segment $2C_1$, $2C_2$

Map C-11

Land Use Categories

- Agriculture
- Grain
- Orchard
- Pasture
- Row Crop
- Rice
- Barren
- Commercial
- Non-Native Grassland
- Meadow
- Riparian, Great Valley Forest
- Riparian, Great Valley Scrub
- Urban
- Perennial Creek
- Canal
- Pond
- River
- Wetland, Freshwater Marsh
- Seasonal Wetland
- Wetland Swale
- Vernal Pool Grassland
- Vernal Pool Isolate

Water Habitat

- Intermittent Creek
- Perennial Creek
- Ditch
- Canal
- Culvert

Species

- Burrowing Owl
- Red-Tailed Hawk
- Elderberry

- Highway
- Road
- Existing Transmission Line
- Substation

Department of Fish and Game

- Wildlife Area
- Significant Area
- 1 Mile Post

N

1,500 750 0 1,500

Feet

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California Spatial Information Library

Surveys Completed by Western: 2005, 2006

Howsley Rd
Cottonwood - Roseville
Pleasant Grove Creek
Phillip Rd
Keys Rd
0
Segment $2C_2$
1
2
<Map C-8
Curry Creek
Map C-12>
Sankey Rd
Locust Rd
5
Jackson Rd
Segment $2C_1$
S Brewer Rd
Country Acres Ln
O'Banion - Elverta #1
6
<Map C-9
Base Line Rd
Yuba
Sutter
Placer
Yolo
Sacramento
1
2
3
4
5
6
7
8
9
10
11
12

Sacramento Area Voltage Support Supplemental EIS and EIR

Aerial Photographs for Routes

Segment $2C_2$

Map C-12

Land Use Categories

- Agriculture
- Grain
- Orchard
- Pasture
- Row Crop
- Rice
- Barren
- Commercial
- Non-Native Grassland
- Meadow
- Riparian, Great Valley Forest
- Riparian, Great Valley Scrub
- Urban
- Perennial Creek
- Canal
- Pond
- River
- Wetland, Freshwater Marsh
- Seasonal Wetland
- Wetland Swale
- Vernal Pool Grassland
- Vernal Pool Isolate

Water Habitat

- Intermittent Creek
- Perennial Creek
- Ditch
- Canal
- Culvert

Species

- Burrowing Owl
- Red-Tailed Hawk
- Elderberry

- Highway
- Road
- Existing Transmission Line
- Substation

Department of Fish and Game

- Wildlife Area
- Significant Area

1 Mile Post

N

1,500 750 0 1,500

Feet

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California Spatial Information Library

Surveys Completed by Western: 2005, 2006

APPENDIX D
Biological Resources

Table D-1 describes habitats from field surveys conducted from O'Banion Substation to Natomas Substation. Table D-2 is a list of endangered, threatened, proposed, and candidate species, which may be present in the study area. The USFWS and National Marine Fisheries Service correspondence contains an area species list.

Table D-1. Habitats Observed Along the Existing Right-of-Way from O'Banion Substation to Natomas Substation

Starting Point (north)		Ending Point (south)		
Road Crossing or Other Descriptive Point	**Segment/ MP 0.1 mile**	**Road Crossing or Other Descriptive Point**	**Segment/ MP 0.1 mile**	**Habitat Type and Description**
O'Banion Substation	1/0	Gilsizer Slough	1/1.3	Cropland – Rice fields with associated irrigation ditches. The irrigation ditches contain some dense vegetation along their banks and may provide suitable giant garter snake habitat. In addition, there is a canal with riparian habitat just west of the ROW.
Gilsizer Slough north bank	1/1.3	Gilsizer Slough south bank	1/1.8	Valley freshwater marsh providing habitat for giant garter snake, tricolored blackbird, and northwestern pond turtle. Gilsizer Slough is a CDFG Code Significant Area[a].
Gilsizer Slough south bank	1/1.8	Orchard bordering floodplain of the Feather River	1/10.6	Cropland – Rice fields and irrigation canals with emergent marsh vegetation provide suitable habitat for giant garter snake.
Orchard bordering floodplain of the Feather River	1/10.6	North levee of Feather River floodplain	1/10.9	Orchard.
North levee of Feather River floodplain	1/10.9	South bank levee of Feather River	1/11.4	Riverine habitat and Great Valley riparian forest on both sides of the river; provides habitat for bald eagle, bank swallow and Swainson's hawk. Three mature elderberry shrubs were observed in Great Valley forest. The alignment crosses the Feather River and Nelson Slough, which are designated critical habitat for chinook salmon and Central Valley steelhead.
South bank levee of Feather River	1/11.4	Lee Road	1/12.7	Cropland.
Lee Road	1/12.7	Power Line Road	1/13.5	Predominantly cropland and some riverine. Small amount of riparian habitat where the ROW crosses Coon Creek. This creek is designated critical habitat for Central Valley steelhead.
Power Line Road	1/13.5	North side of Cross Canal	1/17.1	Predominantly cropland. Small amount of riverine and riparian habitat where the ROW crosses Bunkham Slough.

Table D-1. Habitats Observed Along the Existing Right-of-Way from O'Banion Substation to Natomas Substation

Starting Point (north)		Ending Point (south)		
Road Crossing or Other Descriptive Point	**Segment/ MP 0.1 mile**	**Road Crossing or Other Descriptive Point**	**Segment/ MP 0.1 mile**	**Habitat Type and Description**
North side of Cross Canal	2A/0	Howsley Road	2A/.7	Rice fields to north of ROW and Cross Canal to the south. The canal supports emergent marsh and woody riparian vegetation suitable for giant garter snake and Swainson's hawk and is designated critical habitat for Central Valley steelhead.
Howsley Road	2A/.7	West Elkhorn Boulevard	2A/10.4	ROW runs through rice fields with associated irrigation ditches. The transmission line parallels Highway 99, annual grassland habitat, and irrigation canals with emergent marsh vegetation that provides suitable habitat for giant garter snake.
Intersection of Highway 99 and Riego Road	2A1/5.8	Natomas Road	2A1/8.3	ROW turns east on Riego Road and parallels rice fields with associated irrigation ditches to Natomas Road. The irrigation ditches have emergent marsh vegetation providing suitable habitat for giant garter snake.
Rice field	2A2/6.8	Natomas Road	2A2/9.5	ROW turns east through rice fields and associated irrigation ditches, and then parallels freshwater marsh complex. The irrigation ditches have emergent marsh vegetation providing suitable habitat for giant garter snake.
Intersection of Highway 99 and Elverta Road	2A3/8.3	Point where ROW turns south from Elverta Road	2A3/10.8	ROW turns east through rice fields with irrigation ditches and canals on both sides. An irrigation canal paralleling the ROW (north side of Elverta Road) provides adequate giant garter snake habitat. The ROW crosses one farm residence and a wet meadow.
Intersection of Highway 99 and Elverta Road	2A3/10.8	Wetlands west of East Levee Road	2A3/11.6	ROW turns east through rice fields with associated irrigation ditches, an emergent marsh, and pasture with seasonal wetlands[b] that provide potential for vernal pool fairy shrimp, giant garter snake, and other rare plant endemics. The ROW also crosses farm residences.
West of Elverta Road, ROW turns east	2A3/11.6	Point where 2A3 merges with existing line	2A3/11.9	Vernal pool grassland.[b] Two small farmhouses.

Table D-1. Habitats Observed Along the Existing Right-of-Way from O'Banion Substation to Natomas Substation

Starting Point (north)		Ending Point (south)		
Road Crossing or Other Descriptive Point	**Segment/ MP 0.1 mile**	**Road Crossing or Other Descriptive Point**	**Segment/ MP 0.1 mile**	**Habitat Type and Description**
West Elkhorn Boulevard	2A4/10.5	Point where Segment 2A4 intersects Segment 3	2A4/13.5	ROW parallels agricultural land on the north side with irrigation canals. Non-native grassland occupies the south side of the ROW. Associated irrigation canals provide suitable giant garter snake habitat. ROW crosses non-native grassland and seasonal wetlands.
Rice field	2A5/7.8	Point where Segment 2A5 intersects Segment 2A1	2A5/10.5	Rice fields with irrigation ditches and canals on both sides of ROW. Associated irrigation canals along the ROW provides suitable giant garter snake habitat.
North side of Cross Canal	2B/0	East Levee Road	2B/0.3	ROW intersects Cross Canal (designated critical habitat for Central Valley steelhead) and flood control area that supports emergent marsh and woody riparian vegetation. This area provides suitable habitat for giant garter snake and Swainson's hawk.
East Levee Road	2B/0.3	Howsley Road	2B/0.7	ROW bisects agricultural land to the east and Pleasant Grove Creek Canal[2] to the west. The canal provides emergent marsh vegetation, open water, and woody riparian vegetation, including cottonwood and willow. The channel is suitable habitat for giant garter snake, Swainson's hawk, and western burrowing owl. The ROW bisects three farmhouses.
Howsley Road	2B/0.7	South of Keys Road	2B/3.2	ROW parallels Pleasant Grove Creek Canal[c] with associated wetlands to the west of the ROW, and row crops with irrigation ditches to the east. ROW crosses the perennial Pleasant Grove and Curry creeks, which support emergent marsh and woody riparian vegetation, providing suitable habitat for giant garter snake and Swainson's hawk.
South of Keys Road	2B/3.2	Sankey Road	2B/3.8	Pleasant Grove Creek Canal[c] to the west. ROW crosses Curry Creek at MP 3.2, and non-native grassland with vernal pools[b]. A burrowing owl and its burrow were observed within the ROW at MP 3.5, and another burrow was observed about 150 feet west of the ROW at MP 3.6. The ROW intersects a small residential farm area at about Sankey Road.

Table D-1. Habitats Observed Along the Existing Right-of-Way from O'Banion Substation to Natomas Substation

Starting Point (north)		Ending Point (south)		
Road Crossing or Other Descriptive Point	**Segment/ MP 0.1 mile**	**Road Crossing or Other Descriptive Point**	**Segment/ MP 0.1 mile**	**Habitat Type and Description**
Sankey Road	2B/3.8	Riego Road	2B/6.2	ROW crosses non-native grassland ROW encompasses a small section of the flood control channel[c] before crossing to pastures with vernal pools[b], wet meadows, agricultural fields with associated irrigation ditches, an intermittent stream, and a small pond. The ROW intercepts some pasture and about four farm residences.
Riego Road	2B/6.2	Browning Street	2B/6.6	About 12 residential farms and associated agricultural fields, including non-native grassland with vernal pools and wet meadows.
South of Browning Street	2B/6.6	South of Rio Linda Boulevard	2B/7.5	Non-native grassland with vernal pools[b] and swales, and a small urban area with about five farm residences with associated agricultural fields.
South of Rio Linda Boulevard	2B/7.5	Intersection of Segment 2B with existing line (south of Elverta Substation)	2B/9.4	Non-native grassland with vernal pools[b] and swales, two intermittent creeks, one farm residence, and two agricultural fields. The ROW crosses over the western edge of the Elverta Substation and continues over non-native grassland with vernal pools[2] to the existing line.
North side of Cross Canal	$2C_1/0$	Pacific Avenue	$2C_1/0.5$	ROW intersects Cross Canal and flood control area that supports emergent marsh and woody riparian vegetation. Cross Canal is designated critical habitat for Central Valley steelhead and provides suitable habitat for giant garter snake and Swainson's hawk. The ROW continues along row crops to Pacific Avenue.
Pacific Avenue	$2C_1/0.5$	Fifield Road	$2C_1/2.3$	ROW crosses row crops, rice fields, one farm residence at about Howsley Road, a wet meadow, and two canals with emergent marsh vegetation that provides habitat for giant garter snake.
Fifield Road	$2C_1/2.3$	Pleasant Grove Creek	$2C_1/2.6$	ROW crosses pasture with wetlands and the perennial Pleasant Grove Creek, which supports emergent vegetation and woody riparian species, such as cottonwood and willow, providing suitable habitat for giant garter snake and Swainson's hawk. The ROW also crosses a farm residence.

Table D-1. Habitats Observed Along the Existing Right-of-Way from O'Banion Substation to Natomas Substation

Starting Point (north)		Ending Point (south)		
Road Crossing or Other Descriptive Point	**Segment/ MP 0.1 mile**	**Road Crossing or Other Descriptive Point**	**Segment/ MP 0.1 mile**	**Habitat Type and Description**
Southeast bank of Pleasant Grove Creek	$2C_1$/2.6	Riego Road	$2C_1$/6.8	Rice fields with associated irrigation ditches and canals, row crops, about five farm residences, an emergent marsh, and pastures with vernal pools. The ROW crosses Curry Creek, which supports emergent vegetation and woody riparian species, such as cottonwood and willow and provides suitable habitat for giant garter snake and Swainson's hawk.
Riego Road	$2C_1$/6.8	South of Browning Street	$2C_1$/7.3	Urban areas with about 11 residential homes with small agricultural fields, non-native grassland, and a few man-made ponds.
South of Browning Street	$2C_1$/7.3	Intersection of Segment $2C_1$ with existing lines	$2C_1$/8.0	Non-native grassland with vernal pools and agricultural row crops.
Intersection of existing Western lines	$2C_1$/8.0	South of Rio Linda Boulevard	$2C_1$/8.3	Urban areas with about six residential homes with small agricultural fields and non-native grassland with vernal pools, and a wet meadow.
South of Rio Linda Boulevard	$2C_1$/8.3	Elverta Substation	$2C_1$/9.5	Non-native grassland with vernal pools, a perennial creek with emergent marsh providing habitat for the giant garter snake, an intermittent creek, and two farm residences with associated agricultural crops.
Point where $2C_2$ connects into Cottonwood-Roseville line	$2C_2$/0 (bypass section starting at Keys Road)	Phillips Road	$2C_2$/3.8	Small sections of non-native grassland with vernal pools. Rice fields and row crops with associated irrigation ditches and canals, which provide habitat for the giant garter snake, and two farm residences with man-made ponds both supporting emergent marsh and/or woody vegetation.
Phillips Road	$2C_2$/3.8	Point where $2C_2$ joins the Fiddyment line	$2C_2$/6.2	Large sections of non-native grassland with vernal pools, row crops, rice fields, and Curry Creek at MP 5.0 with woody riparian vegetation, and an intermittent creek at MP 5.7.
Elverta Substation	3/0	Natomas East Main Drainage Canal	3/0.7	Non-native grassland with seasonal wetlands supporting vernal pool species and a freshwater marsh with open water supporting emergent marsh vegetation.

Table D-1. Habitats Observed Along the Existing Right-of-Way from O'Banion Substation to Natomas Substation

Starting Point (north)		Ending Point (south)		
Road Crossing or Other Descriptive Point	**Segment/ MP 0.1 mile**	**Road Crossing or Other Descriptive Point**	**Segment/ MP 0.1 mile**	**Habitat Type and Description**
Natomas East Main Drainage Canal	3/0.7	Point where Segment 3 turns south	3/1.0	Natomas East Main Drainage Canal is critical habitat for Central Valley steelhead. Emergent marsh vegetation is within canal. ROW crosses annual grassland with seasonal wetlands supporting vernal pool species, and a freshwater marsh with open water and emergent marsh vegetation.
Point where Segment 3 turns south	3/1.0	Elkhorn Boulevard	3/2.3	Agricultural cropland and non-native grassland with sparsely scattered seasonal wetlands and vernal pools.
Elkhorn Boulevard	3/2.3	Del Paso Road	3/4.4	Non-native grassland with sparsely scattered seasonal wetlands and vernal pools, and agricultural row crops.
Del Paso Road	3/4.4	Natomas Substation	3/4.8	Urban area.

[a] CDFG Significant Area: Location identified by CNDDB to have ecological significance because it is a rare habitat type and/or supports rare species.

[b] Vernal pools and seasonal wetlands throughout provide habitat for vernal pool fairy shrimp and rare vernal pool plant endemics.

[c] The entire portion of the Pleasant Grove Creek Canal along Segment 2B has emergent marsh and pockets of woody riparian vegetation such as willow and cottonwood that provides habitat for the giant garter snake and Swainson's hawk.

MP = milepost

ROW = right-of-way

CDFG = California Department of Fish and Game

CNDDB = California Natural Diversity Database

TNBC = The Natomas Basin Conservancy

Table D-2. Federally Listed Endangered, Threatened, Proposed, and Candidate Species that May Occur in the Study Area

Species Name	Preferred Habitat	Likelihood of Occurrence	Status Federal/State/CNPS
Mammals			
Neotoma fuscipes riparia Riparian (San Joaquin) woodrat	Riparian habitats where trees and brush are available for cover and nesting	U	E/SC/—
Sylvilagus bachmani riparius Riparian brush rabbit	Dense, brushy areas of riparian forests above flood level	U	E/E/—
Taxidea taxus American badger	Abundant in drier open stages of most shrub, forest, and herbaceous habitats with friable soils	A	—/SC/—
Birds			
Accipiter cooperii Cooper's hawk	Nests mainly in riparian growth of deciduous trees such as canyon bottoms on river floodplains; also in live oaks	A	—/SC/— PCCP Species
Agelaius tricolor Tricolored blackbird	Largest colonies are found in the Sacramento and San Joaquin Valleys. California birds reside in their breeding territories year-round preferring, annual grasslands, wet and dry vernal pools, and other seasonal wetlands	C	—/SC/— NBHCP Species PCCP Species
Athene cunicularia hypugaea Western burrowing owl	Nests in burrows in grassland areas where ground squirrels are present	C	—/SC/— NBHCP Species PCCP Species
Buteo swainsoni (nesting) Swainson's hawk	Nests in oak or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, and grain fields	C	—/T/— NBHCP Species PCCP Species
Branta Canadensis leucopareia Aleutian Canada Goose	Waterways in open, grassy habitats such as grasslands and chaparral. They also inhabit manmade habitats that are open and grassy, such as golf courses, agricultural land, airports, and parks	A, M	NBHCP Species
Charadrius montanus Mountain plover	Winter resident in valley and foothill grassland and cropland including valley needle grassland, valley wild rye grassland, non-native grassland, and wildflower field. Prefers short vegetation, bare ground, and flat topography	A	—/SC/—

Table D-2. Federally Listed Endangered, Threatened, Proposed, and Candidate Species that May Occur in the Study Area

Species Name	Preferred Habitat	Likelihood of Occurrence	Status Federal/State/CNPS
Coccyzus americanus occidentalis (nesting) Western yellow-billed cuckoo	Great Valley cottonwood riparian forest; Great Valley mixed forest; and Great Valley, valley oak riparian forest	C	C/E/—
Falco peregrinus anatum American peregrine falcon	Nests near wetlands, lakes, or rivers on cliffs, banks, dunes, mounds, and also manmade structures	A	—/E/— NBHCP Species PCCP Species
Grus canadensis tabida Greater sandhill crane	Nests and winters in shallow wetland habitats of northeast California and Central Valley	A	—/T/— NBHCP Species
Haliaeetus leucocephalus Bald eagle	Riverine and riparian that may include great valley cottonwood riparian forest; Great Valley mixed forest. Prefers large bodies of water or free-flowing rivers with abundant fish and adjacent snags or other perches	A	T/E/— PCCP Species
Lanius ludovicianus Loggerhead shrike	Nests in broken woodlands, prefers dense shrubs and brush with thorns	A, M	—/SC/— NBHCP Species
Progne subis Purple martin	Nests in woodlands; mostly woodpecker cavities or human-made structures. Nests are often located in a tall isolated tree	A	—/SC/—
Plegadis chihi White faced ibis	Shallow fresh-water marsh and dense thickets for nesting, interspersed with areas of shallow water for foraging	A	—/SC/— NBHCP Species
Riparia riparia (nesting) Bank swallow	Nests in bluffs or bands, usually adjacent to water, where the soil consists of sand or sandy loam to allow digging	C	—/T/— NBHCP Species
Reptiles			
Clemmys marmorata marmorata Northwestern pond turtle	Found near a wide variety of wetlands, including vernal pools, marshes, streams, and irrigation ditches; usually with vegetative cover used as basking sites	A	—/SC/— NBHCP Species
Phrynosoma coronatum frontale California horned lizard	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes	A	—/SC/—
Thamnophis gigas Giant garter snake	Freshwater emergent wetland habitats, cropland (rice fields)	C	T/T/— NBHCP Species PCCP Species

Table D-2. Federally Listed Endangered, Threatened, Proposed, and Candidate Species that May Occur in the Study Area

Species Name	Preferred Habitat	Likelihood of Occurrence	Status Federal/State/CNPS
Amphibians			
Ambystoma californiense California tiger salamander	Grassland habitats that may include valley needle grassland, valley wild rye grassland, non-native grassland and wildflower fields with vernal pools or other temporary ponds. Other habitats include valley-oak woodland	A	T/SC/— NBHCP Species PCCP Species
Rana aurora draytonii California red-legged frog	Lacustrine and riverine. Prefers standing or slow-moving water with overhanging vegetation	U	T/SC/— PCCP Species
Spea hammondii Western spadefoot toad	Occurs primarily in grassland habitats, but can be found in valley-foothill woodlands; vernal pools are essential for breeding and egg laying	A	—/SC/— NBHCP Species PCCP Species
Fish			
Hypomesus transpacificus Delta smelt	Riverine: mixing zone of the Sacramento–San Joaquin River Delta, where the delta smelt spends most of its adult life	A, M	T/T/—
Oncorhynchus mykiss Central Valley steelhead	Riverine habitats; spawns in main stems of the Sacramento and San Joaquin rivers	A, M	T/—/— PCCP Species
O. mykiss Critical habitat, Central Valley steelhead	Critical habitat present within the Project area	A, M	T/—/—
O. tshawytscha Winter-run chinook salmon	Riverine habitats; spawns in main stems and tributaries of the Sacramento River	A, M	E/—/—
O. tshawytscha Critical habitat, winter-run chinook salmon	Critical habitat present within the Project area	A, M	E/—/—
O. tshawytscha Central valley spring-run chinook salmon	Riverine habitats; spawns in main stems and tributaries of the Sacramento and San Joaquin rivers	A, M	T/—/—
O. tshawytscha Critical habitat, spring-run chinook salmon	Critical habitat present within the Project area	A, M	T/—/—
O. tshawytscha Central valley fall-run chinook salmon	Riverine habitats; spawns in main stems and tributaries of the Sacramento and San Joaquin rivers	A, M	C/—/—

Table D-2. Federally Listed Endangered, Threatened, Proposed, and Candidate Species that May Occur in the Study Area

Species Name	Preferred Habitat	Likelihood of Occurrence	Status Federal/State/CNPS
O. tshawytscha Critical habitat, fall-run chinook salmon	Critical habitat present within the Project area	A, M	C/—/— PCCP Species
Pogonichthys macrolepidotus Sacramento splittail	Riverine habitats, Sacramento and San Joaquin rivers, freshwater marsh, estuary, slow-moving river sections, and dead-end sloughs; requires flooded vegetation for spawning and foraging for young	A	—/SC/—
Invertebrates			
Branchinecta conservatio Conservancy fairy shrimp	Seasonally in grassland vernal pools and shallow swales	U	E/—/— NBHCP Species
Branchinecta longiatenna Longhorn fairy shrimp	Vernal pools and swales in the Sacramento Valley containing clear to highly turbid water	U	E/—/— NBHCP Species
Branchinecta mesovallensis Midvalley fairy shrimp	Vernal pools and swales in the Sacramento Valley	A	NBHCP Species
Branchinecta lynchi Vernal pool fairy shrimp	Vernal pools and swales in the Sacramento Valley containing clear to highly turbid water	C	T/—/— PCCP Species
Linderiella occidentalis California linderiella	Vernal pools in unplowed grasslands with old alluvial soils underlain by hardpan or sandstone depressions	C	—/SC/—
Lepidurus packardi Vernal pool tadpole shrimp	Vernal pools and swales in the Sacramento Valley containing clear to highly turbid water	C	E/—/— NBHCP Species PCCP Species
Desmocerus californicus dimorphus Valley elderberry longhorn beetle	Riparian habitats that may include Great Valley cottonwood riparian forest; great valley mixed forest; and Great Valley, valley oak riparian forest, provided elderberry shrubs are present	C	T/—/— NBHCP Species PCCP Species
Plants			
Balsamorhiza macrolepis var. macrolepis Big-scale balsamroot	Valley and foothill grassland, cismontane woodland	U	—/—/1B
Cordylanthus mollis ssp. hispidus Hispid bird's-beak	Meadows, valley and foothill grassland	U	—/—/1B
Cordylanthus palmatus Palmate-bracted bird's-beak	Alkaline soils	U	E/E/1B

Table D-2. Federally Listed Endangered, Threatened, Proposed, and Candidate Species that May Occur in the Study Area

Species Name	Preferred Habitat	Likelihood of Occurrence	Status Federal/State/CNPS
Downingia pusilla Dwarf downingia	Vernal pools, valley and foothill grassland	C	—/—/2
Gratiola heterosepala Boggs Lake hedge-hyssop	Clay soils in areas of shallow water, lake margins and vernal pool margins	C	—/E/1B NBHCP Species
Hibiscus lasiocarpus Rose-mallow	Freshwater marshes and swamps	C	—/—/2
Juncus leiospermus var. leiospermus Red bluff dwarf rush	Vernal pool, valley and foothill grassland, chaparral	U	—/—/1B
Lathyrus jepsonii var. jepsonii Delta tule pea	Freshwater and brackish marsh	A	—/—/1B NBHCP Species
Legenere limosa Legenere	Vernal pools	C	—/—/1B NBHCP Species PCCP Species
Orcuttia viscida Sacramento Orcutt grass	Vernal pools	A	E/E/1B NBHCP Species
Orcuttia tenuis Slender Orcutt grass	Vernal pools	A	T/E/1B NBHCP Species
Sagittaria sanfordii Sanford's arrowhead	Standing or slow moving freshwater ponds, marshes, and ditches	A	—/—/1B NBHCP Species
Tuctoria mucronata Solano grass	Clay bottoms of drying vernal pools and lakes in valley and foothill grassland	A	E/E/1B

Sources: California Natural Diversity Database 2006, U.S. Fish and Wildlife Service 2006, and National Oceanic and Atmospheric Administration 2007

CDFG = California Department of Fish and Game;

NBHCP = Natomas Basin Habitat Conservation Plan

CNPS = California Native Plant Society

PCCP = Placer County Conservation Plan

Likelihood of Occurrence:
A = Assumed present (suitable habitat exists in the ROW)
C = Confirmed within project area
U = Unlikely to occur
M = Migrant

Federal Status
C = Candidate for listing
E = Endangered
T = Threatened

State/CDFG Status
E = Endangered
T = Threatened
R = Rare
SC = California special concern species

CNPS Status
1B = Rare and endangered in California and elsewhere
2 = Rare, threatened or endangered in California but more common elsewhere

APPENDIX E
Mitigation Monitoring Report Plan

E.1 INTRODUCTION

The Western Area Power Administration (Western) and Sacramento Municipal Utility District (SMUD) included a series of Environmental Protection Measures (EPM) in the project description for the Sacramento Area Voltage Support Supplemental Environmental Impact Statement (SEIS) and Environmental Impact Report (EIR) to minimize potential environmental impacts during Project construction and operation. Those EPMs are listed in Table E-1.

This Mitigation Monitoring Report Plan (MMRP) is intended to be used by Western to ensure that each EPM and mitigation measure, adopted as a condition for project approval, is implemented. The MMRP meets the requirements of the National Environmental Policy Act (NEPA), and is consistent with the California Environmental Quality Act (CEQA), as amended (Guidelines Section 15074(d)) for the preparation of monitoring provisions for the implementation of mitigation assigned as part of the proposed Project.

E.2 MITIGATION IMPLEMENTATION AND MONITORING

Western will be responsible for monitoring the implementation of EPMs and mitigation measures. Western will designate specific personnel to implement and document all aspects of the MMRP. Western will ensure that the designated personnel have authority to enforce mitigation requirements and will be capable of terminating project construction activities found to be inconsistent with mitigation objectives or proposed Project approval conditions.

Western will demonstrate compliance with other agency permit conditions to appropriate regulatory agencies. It will also be responsible for ensuring that construction personnel understand their responsibilities for adhering to the performance requirements of the mitigation plan and other contractual requirements related to the implementation of mitigation as part of the proposed Project construction.

Table E-1. Sacramento Area Voltage Support Project Environmental Protection Measures and Monitoring Summary

EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
1.	Air Quality	Western would adhere to all requirements of those entities having jurisdiction over air quality matters and obtain any permits needed for construction activities. Open burning of construction trash would not be allowed.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
2.	Air Quality	Project participants would use reasonably practicable methods and devices to control, prevent, and otherwise minimize atmospheric emissions or discharges of air contaminants.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
3.	Air Quality	Visible emissions from all off-road diesel-powered equipment would not exceed 40 percent opacity for more than three minutes in any one hour.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
4.	Air Quality	Equipment and vehicles that show excessive emissions of exhaust gases caused by poor engine adjustments or other inefficient operating conditions would not be operated until corrective repairs or adjustments were made.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
5.	Air Quality	Vehicles and equipment used in construction and maintenance of the proposed Project or alternatives would maintain appropriate emissions control equipment and be appropriately permitted.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
6.	Air Quality	Road construction would include dust-control measures such as watering and other approved suppressing agents for limiting dust generation.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
7.	Air Quality	Fill material storage piles would include dust-control measures such as water or chemical suppressants.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN

Table E-1. Sacramento Area Voltage Support Project Environmental Protection Measures and Monitoring Summary

EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
8.	Air Quality	Ground surfaces that have been significantly disturbed would be seeded appropriately to prevent wind dispersion of soil.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
9.	Air Quality	Removal of vegetation and ground disturbance would be limited to the minimum area necessary to complete proposed Project construction activities. Vegetative cover would be maintained on all other portions of the proposed Project area.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
10.	Air Quality	Regular watering of exposed soils and unpaved access roads would be conducted during the construction period.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
11.	Air Quality	Grading activities would cease during periods of high winds (greater than 20 miles per hour averaged over 1 hour).		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
12.	Air Quality	Trucks transporting loose material would be covered or would maintain at least 2 feet of freeboard and not create any visible dust emissions.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
13.	Air Quality	Excessive engine idling will be minimized according to Placer County and City of Sacramento regulations.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN

Table E-1. Sacramento Area Voltage Support Project Environmental Protection Measures and Monitoring Summary

EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
14.	Air Quality	A comprehensive inventory (e.g., make, model, year and emission rating) would be submitted to the relevant air districts of all the heavy-duty off-road equipment (50 horsepower or greater) that would be used in aggregate of 40 or more hours for the construction project. The inventory shall be updated and submitted monthly throughout the duration of the project, except that an inventory shall not be required for any 30-day period in which no construction activity occurs. At least 48 hours prior to the use of subject heavy-duty off-road equipment, the project representative shall provide the air districts with the anticipated construction timeline, including start date, name and phone number of the project manager and on-site foreman. Heavy-duty equipment would meet the standard emissions reduction of 20 percent NO_x and 45 percent PM_{10} compared to the most recent California Air Resources Board (CARB) fleet average at the time of construction.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
15.	Biological Resources	Mitigation measures developed during the consultation period under Section 7 of the Endangered Species Act (ESA) would be adhered to, as specified in the subsequent Biological Opinion of U.S. Fish and Wildlife Service (USFWS). In addition, mitigation developed in conjunction with state and Tribal authorities would be followed.	Prior to the start of construction activities	Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN

Table E-1. Sacramento Area Voltage Support Project
Environmental Protection Measures and Monitoring Summary

EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
16.	Biological Resources	Before construction and maintenance, all personnel would be instructed on the protection of cultural, paleontological, and ecological resources. To assist in this effort, the construction and maintenance contract would address applicable Federal, state, local and Tribal laws regarding collection and removal antiquities, fossils, plants, and wildlife. Training would include the importance of these resources and the purpose and necessity of protecting them.	Prior to the start of construction activities	Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
17.	Biological Resources	Special-status species and their habitats would be protected during post-EIS and EIR phases of the project. This may involve conducting surveys for habitat, plant, and wildlife species of concern. Where special-status species or their habitats are found, appropriate action would be taken to avoid adverse impacts on the species and/or their habitat.	Prior to the start of construction activities	Throughout the project construction period	Prior to the start of construction activities	Throughout the project construction period	WESTERN	WESTERN
18.	Biological Resources, Wetlands	A qualified biologist would conduct a site survey before clearing vegetation in sensitive habitats. The purpose of this survey would be to identify any biologically sensitive issues such as wetlands, vernal pools, or habitat of concern. Western would avoid these areas to the extent practical.	Prior to the start of construction activities	Throughout the project construction period	Prior to the start of construction activities	Throughout the project construction period	WESTERN	WESTERN
19.	Biological Resources	During construction and maintenance, no equipment refueling or oil changing would be conducted within 300 feet of any bodies of water or streams.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
20.	Biological Resources	Within riverine habitat, ROW clearing would be done by mechanical and manual methods. Construction and maintenance activities would be avoided within 100 feet of the stream bank.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN

Table E-1. Sacramento Area Voltage Support Project Environmental Protection Measures and Monitoring Summary

EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
21.	Biological Resources	Vegetation would be controlled or removed in accordance with Western's *Integrated Vegetation Management Environmental Guidance Manual* (Western 2007b).		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
22.	Biological Resources, Wetlands	Freshwater emergent, lacustrine, and riverine wetlands would be spanned and vehicular traffic would be prohibited within 100 feet of the high-water boundary of these wetlands.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
23.	Biological Resources, Wetlands	To the extent practical, when water is present, vernal pools would be driven around, spanned, or otherwise avoided.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
24.	Biological Resources	Replacing insulators on structures containing active raptor nests would be conducted after birds have fledged. Inactive nests would not be removed from structures unless they pose a safety or reliability hazard.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
25.	Biological Resources, Water Resources	Western would span the Feather River and Cross Canal riparian corridor and no construction or maintenance equipment would cross these water bodies. Sedimentation control structures would be used to prevent sediment from reaching riverine habitat.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
26.	Biological Resources, Floodplains, Water Resources, Wetlands	Hazardous materials would not be drained onto the ground or into streams or drainage areas. All construction and maintenance waste, including trash and litter, garbage, other solid waste, petroleum products, and other regulated materials, would be removed daily to a disposal facility authorized to accept such materials.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN

Table E-1. Sacramento Area Voltage Support Project Environmental Protection Measures and Monitoring Summary

EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
27.	Biological Resources, Soils	At completion of work and at the request of the land owner/manager, all work areas except access roads would be scarified or left in a condition that would facilitate natural or appropriate vegetation, provide for proper drainage, and prevent erosion.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
28.	Biological Resources	Equipment would be washed prior to entering sensitive areas within the Project area to control noxious weeds. The rinse water would be disposed of through the sanitary sewage system.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
29.	Biological Resources	Vernal pool resources–specific. Biological reconnaissance surveys, preconstruction surveys, and other biological investigations would be conducted to identify on-site vernal pool resources. If it is determined that wetland and/or vernal pool resources occur, Western would consult USFWS. Western assumes presence of listed species in suitable vernal pools. Section 7 consultation with USFWS would determine appropriate measures to avoid and minimize loss of individuals.	Prior to the start of construction activities	Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
30.	Biological Resources	Boggs Lake hedge hyssop and legenere-specific. If preconstruction surveys determine the presence of the species, Western would consult with USFWS to determine appropriate measures to avoid and minimize loss of individuals.	Prior to the start of construction activities	Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
31.	Biological Resources	Riparian habitat-specific. If riparian vegetation requires replacement, it will be replaced at a 3:1 ratio on site or within the watershed, using native riparian trees and/or vegetation.	At the completion of project construction		At the completion of project construction	Post-construction monitoring to ensure survival	WESTERN	WESTERN

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EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
32.	Biological Resources	Valley elderberry longhorn beetle-specific. Surveys for beetles and elderberry host plants by a qualified biologist will be conducted prior to construction and maintenance activities. To the maximum extent practicable, the project will avoid stands of elderberry bushes and avoid isolation of elderberry bushes from other nearby plant populations	Prior to the start of construction activities			Throughout the project construction period	WESTERN	WESTERN
33.	Biological Resources	Valley elderberry longhorn beetle-specific. If elderberry plants cannot be avoided, and if approved by the USFWS through consultation, then transplantation/replacement mitigation measures may be implemented. Preconstruction surveys will assess the appropriate amount of mitigation.	Prior to the start of construction activities	Throughout the project construction period	At the completion of project construction		WESTERN	WESTERN
34.	Biological Resources	Western spadefoot toad-specific. If preconstruction surveys determine the presence of the toad, Western would consult with USFWS to determine appropriate measures to avoid and minimize take of individuals.	Prior to the start of construction activities	Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
35.	Biological Resources	Giant garter snake-specific. Preconstruction surveys for giant garter snake would be completed by a qualified biologist approved by USFWS. If any snake habitat is found, additional measures would be implemented to minimize disturbance of habitat and harassment of the species.	Prior to the start of construction activities	Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN

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EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
36.	Biological Resources	Giant garter snake-specific. Between April 15 and September 30, all irrigation ditches, canals, or other aquatic habitat would be completely dewatered, with no puddle water remaining, for at least 15 consecutive days prior to the excavation or filling in of the dewatered habitat. Efforts would be made to ensure that dewatered habitat does not continue to support prey. If a site cannot be completely dewatered, netting and salvage of prey items may be necessary.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
37.	Biological Resources	Giant garter snake-specific. For sites containing snake habitat, and no more than 24 hours prior to start of construction activities (site preparation and/or grading), the Project area would be surveyed for the presence of the snake. If construction activities stop on the site for a period of 2 weeks or more, a new snake survey would be completed no more than 24 hours prior to the resumption of construction activities.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
38.	Biological Resources	Giant garter snake-specific. Clearing would be confined to the minimal area necessary to facilitate construction and maintenance activities. Giant garter snake habitat within or adjacent to the Project would be flagged and designated as environmentally sensitive areas. This area would be avoided by all construction personnel.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN

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EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
39.	Biological Resources	Giant garter snake-specific. If a live giant garter snake is found during construction and maintenance activities, USFWS and the Project's biological monitor will be notified immediately. The biological monitor or his/her assignee shall do the following: 1. Escape routes for snakes should be determined in advance of construction and maintenance and snakes should always be allowed to leave on their own. 2. Stop construction and maintenance activities in the vicinity of the snake. 3. Monitor the snake and allow it to leave on its own. The monitor shall remain in the area for the remainder of the workday to make sure that the snake is not harmed, or if it leaves the site, that it does not return. If a giant garter snake does not leave on its own within 1 working day, further consultation with USFWS is required.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
40.	Biological Resources	Giant garter snake-specific. If any temporary fill and/or construction debris situated near undisturbed giant garter snake habitat is to be removed between October 1 and April 30, it would be inspected by a qualified biologist to ensure the snakes are not using it as an overwintering site.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
41.	Biological Resources	Giant garter snake-specific. No plastic, monofilament, jute, or similar erosion control matting that could entangle snakes would be placed on a Project site when working within 200 feet of snake habitat. Possible substitutions include coconut coir matting, tactified hydroseeding compounds, or other material approved by USFWS.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN

Table E-1. Sacramento Area Voltage Support Project Environmental Protection Measures and Monitoring Summary

EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
42.	Biological Resources	Northwestern pond turtle–specific. Take of the turtle as a result of habitat destruction during construction and maintenance activities, including maintenance and removal of irrigation ditches and drains, would be minimized by the dewatering requirements described for the giant garter snake.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
43.	Biological Resources	Chinook salmon or steelhead-specific. The site would be monitored to ensure that no listed fish are present and/or harmed if working in a water channel. If listed fish are present, NMFS and CDFG, if appropriate, would be consulted.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
44.	Biological Resources	Western yellow-billed-specific. If preconstruction surveys or other sources determine the presence of nesting birds, construction avoidance areas would be enforced for a distance of 300 feet from the nest site, until young birds have fledged and left the nesting site.	Prior to the start of construction activities	Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
45.	Biological Resources	Bank swallow-specific. Disturbances to nesting colonies would be avoided within the nesting season of May 1 through August 31, or until a qualified biologist, with concurrence of USFWS and CDFG, if appropriate, has determined that the young have fledged or the nests are no longer occupied.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN

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EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
46.	Biological Resources	Bank swallow-specific. If preconstruction surveys identify an active nesting colony, brightly colored construction fencing will be installed 250-feet from the active nesting colony. No construction disturbances will occur within the 250-foot fenced area during the nesting season In addition, disturbances within 0.5 mile upstream or downstream of a colony located on a natural waterway would be avoided.	Prior to the start of construction activities	Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
47.	Biological Resources	Tricolored blackbird-specific. If preconstruction surveys determine the presence of breeding and nesting birds, disturbances to nesting colonies would be avoided. A boundary shall be marked by brightly colored construction fencing establishing a 500 foot buffer from the active nest site. No disturbances would occur within the 500 foot area during the nesting season, February 1 to August 1 or while birds are present. Before the site can be disturbed, a qualified biologist, with concurrence by USFWS, would determine if the young have fledged and nest sites are no longer active.	Prior to the start of construction activities	Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN

Table E-1. Sacramento Area Voltage Support Project Environmental Protection Measures and Monitoring Summary

EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
48.	Biological Resources	Burrowing owl-specific. Preconstruction surveys would be conducted prior to earth-disturbing activities to determine the presence of foraging or nesting owls. The surveys would be conducted by a qualified biologist. Results of the preconstruction surveys would be submitted to the land use agency with jurisdiction over the site prior to commencement of construction activities and a mitigation program would be developed and agreed to by the land use agency and Western prior to initiation of any physical disturbance on site.	Prior to the start of construction activities	Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
49.	Biological Resources	Burrowing owl-specific. Occupied burrows shall not be disturbed during nesting season (February 1 through August 31). No disturbance should occur within 50 meters of occupied burrows during the non-breeding season (September 1 to January 31) or within 75 meters during the breeding season (February 1 to August 31). A minimum of 6.5 acres of foraging habitat, contiguous with occupied burrow sites, would be permanently preserved for each pair of breeding burrowing owls or single unpaired resident bird.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN

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EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
50.	Biological Resources	Burrowing owl-specific. If nests are found, USFWS and CDFG, if appropriate, would be contacted regarding suitable mitigation measures. These may include a 300 foot buffer around the nest site during the breeding season, relocation efforts for owls that have not begun egg-laying and incubation, or relocation of juveniles capable of independent survival. If on-site avoidance is required, the boundaries of the buffer zone would be determined by a qualified biologist and marked with yellow caution tape, stakes, or temporary fencing. The buffer zone would be maintained throughout the construction period. If relocation is approved by USFWS, a qualified biologist will prepare a plan for relocating the owls to a suitable site.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
51.	Biological Resources	Swainson's hawk-specific. A preconstruction survey would be completed to determine if active Swainson's hawk nest sites occur on or within 0.5 mile or if any Swainson's hawk nest trees would be removed on the Project site. Surveys would be conducted by experienced Swainson's hawk surveyors using Swainson's hawk Technical Advisory Committee's methods (May 31, 2000 or newer), as approved by USFWS.	Prior to the start of construction activities	Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN

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EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
52.	Biological Resources	Swainson's hawk-specific. If breeding hawks are identified, no disturbances would occur within 0.5 mile of an active nest between March 15 and September 15, or until a qualified biologist, with discussion with CDFG, if appropriate, has determined that the young have fledged or the nest is no longer occupied. If an active nest site is located within 0.25 mile of existing urban development, a no-disturbance zone of 0.25 mile would be set.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
53.	Biological Resources	Swainson's hawk-specific. Where disturbance of a hawk nest cannot be avoided, construction would be deferred until after the nesting season. Then, if necessary, the nest tree may be removed after discussion with CDFG, if appropriate, and it has been determined that the young are no longer dependent upon the nest tree.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
54.	Biological Resources	Swainson's hawk-specific. If construction activities would cause nest abandonment or force out fledglings within a 0.25-mile buffer zone of the Project area, an on-site qualified raptor biologist would be assigned to the project.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
55.	Biological Resources	Swainson's hawk-specific. Valley oaks, tree groves, riparian habitat, and other large trees used by Swainson's hawk and other animals will be preserved wherever possible. If Swainson's hawk nest trees are lost, Western would implement mitigation planting.	Prior to the start of construction activities				WESTERN	WESTERN

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EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
56.	Biological Resources	Upon locating dead, injured or sick threatened or endangered species, the USFWS Division of Law Enforcement (2800 Cottage Way, Sacramento, CA 95825) or the Sacramento Fish and Wildlife Ecological Services Office (2800 Cottage Way, Room W 2605, Sacramento, CA 95825, telephone 916 414 6000) must be notified within 1 working day. Written notification to both offices must be made within 3 calendar days and must include the date, time, and location of the discovery and any other pertinent information.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
57.	Cultural Resources, Paleontological Resources	Before construction, all supervisory construction personnel would be instructed by Western on the protection of cultural, paleontological, and ecological resources and that cultural resources might be presented in the study area. To assist in this effort, the construction contract would address applicable Federal and state laws regarding antiquities, fossils, plants, and wildlife, including collection and removal, and the importance of these resources and the purpose and necessity of protecting them. Contractors would be trained to stop work near any discovery and notify Western's regional environmental manager, who would ensure that the resource is evaluated and avoided. Known cultural resources would be fenced and a minimum distance maintained for work disturbances.	Prior to the start of construction activities	Throughout the project construction period	Prior to the start of construction activities	Throughout the project construction period	WESTERN	WESTERN

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EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
58.	Cultural Resources	Where ground-disturbing activities are identified, cultural resource evaluations would be done to determine the need for field inventory. Construction activities would avoid all historic properties or a special use permit or Memorandum of Agreement would be developed in consultation with the State Historic Preservation Office (SHPO). Avoidance would include the use of temporary construction fencing where activities are planned to take place near cultural resources sites boundaries.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
59.	Cultural Resources, Floodplains, Water Resources, Wetlands	Direct impacts to irrigation system and drainage canal features that are eligible for the NRHP would be avoided during the siting of new transmission line structures and access roads and most other irrigation system features would be avoided to the extent practicable in siting new structures and access roads.	Prior to the start of construction activities	Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
60.	Cultural Resources	Cultural resources would be considered during post-EIS phases of proposed Project implementation. Surveys would be completed to inventory and evaluate cultural resources of the Preferred Alternative, or of any components that might be added to the project, or any existing components that would be modified. These surveys and any resulting property evaluation and analysis of effects would be conducted in accordance with Section 106 of the National Historic Preservation Act (NHPA) and in consultation with the SHPO.	Prior to the start of construction activities		Prior to the start of construction activities		WESTERN	WESTERN

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EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
61.	Electric and Magnetic Fields	Complaints of radio or television interference generated by the transmission line will be responded to and appropriate actions taken.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
62.	Floodplains, Soils, Water Resources, Wetlands	Surface restoration would occur in construction areas, material storage yards, structure sites, spur roads, and existing access roads where ground disturbance occurs or where recontouring is required.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
63.	Floodplains, Soils, Water Resources, Wetlands	Access roads would be built at right angles to the streams and washes to the extent practicable. Culverts would be installed where needed. All construction and maintenance activities would be conducted to minimize disturbance to vegetation and drainage channels.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
64.	Floodplains, Soils, Water Resources, Wetlands	Excavated material or other construction materials would not be stockpiled or deposited near or on stream banks, lake shorelines, or other watercourse perimeters.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
65.	Floodplains, Soils, Water Resources, Wetlands	Non-biodegradable debris would be collected and removed from the ROW daily and taken to a disposal facility. Slash and other biodegradable debris would be left in place or disposed of.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
66.	Floodplains, Soils, Water Resources, Wetlands	All soil excavated for structure foundations would be backfilled and tamped around the foundations, and used to provide positive drainage around the structure foundations. Excess soil would be removed from the site and disposed of appropriately. Areas around structure footings would be reseeded with native plants.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN

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EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
67.	Floodplains, Water Resources, Wetlands	Wherever possible, new structures and access roads would be sited out of floodplains. Due to the abundance of floodplains and surface water resources in the study area, complete avoidance may not be possible and Western would consult with U.S. Army Corps of Engineers (USACE).	Prior to final design		Prior to final design		WESTERN	WESTERN
68.	Geology	Geological hazards would be evaluated during final design specification for each structure location and road construction area. Options would include avoidance of a poor site by selection of a site with stable conditions or correction of the unstable slope conditions.	Prior to final design		Prior to final design		WESTERN	WESTERN
69.	Geology, Soils	A California-registered Professional Geotechnical Engineer would evaluate the potential for geotechnical hazards and unstable slopes on the centerline route and areas of new road construction or widening on slopes with more than a 15 percent gradient.	Prior to final design		Prior to final design		WESTERN	WESTERN
70.	Health and Safety, Traffic	Conform with safety requirements for maintaining the flow of public traffic and conduct construction operations to offer the least possible obstruction and inconvenience to public transportation.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
71.	Health and Safety	Comply with all applicable health and safety laws, regulations, and standards.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
72.	Health and Safety	Post proper signage in areas within the ROW that would require temporary closure or limited access to accommodate certain land uses.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN

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EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
73.	Health and Safety	Mark structures and/or shield wire with highly visible devices for identified locations, as required by applicable laws and regulations (for example, the Federal Aviation Administration regulations).		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
74.	Land Use	When weather and ground conditions permit, all construction-caused deep ruts that are hazardous to farming operations and moving equipment would be restored to preconstruction conditions or compensation would be provided as an alternative if the landowner desires. Such ruts would be leveled, filled and graded, or otherwise eliminated in an approved manner. Ruts, scars, and compacted soils from construction activities in hay meadows, alfalfa fields, pastures, and cultivated productive lands would be loosened and leveled by scarifying, harrowing, discing, or other appropriate method. Damage to ditches, tile drains, terraces, roads and other features of the land would be corrected. The land and facilities would be restored as nearly as practicable to their original conditions.		At the completion of project construction		At the completion of project construction	WESTERN	WESTERN
75.	Land Use	On completion of the work, all work areas except permanent access roads would be returned to pre-construction conditions unless otherwise specified by the land owner/ manager.		At the completion of project construction		At the completion of project construction	WESTERN	WESTERN
76.	Land Use	During construction, movement would be limited to the access roads and within a designated area in the ROW to minimize damage to agricultural land.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN

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EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
77.	Land Use	Construction operations would be conducted to prevent unnecessary destruction, scarring or defacing of the natural surroundings to preserve the natural landscape to the extent practicable.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
78.	Land Use	No permanent discoloring agents would be applied to rocks or vegetation to indicate limits of survey.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
79.	Land Use	Damaged fences and gates would be repaired or replaced to restore them to their preconstruction condition.		At the completion of project construction		At the completion of project construction	WESTERN	WESTERN
80.	Land Use	Some land uses occurring within the ROW would require temporary closure or limited access. Proper signage would be posted in these areas.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
81.	Land Use	Power lines would span sensitive land uses to the extent possible. Where practical, access roads would be placed to avoid sensitive areas.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
82.	Land Use	Where practical, construction activities would be scheduled during periods when agricultural activities would be minimally affected or the landowner would be compensated accordingly.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
83.	Land Use	Structure design and placement would be selected to reduce potential conflicts with agricultural practices and the amount of land required for transmission lines.	Prior to final design		Prior to final design		WESTERN	WESTERN

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EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
84.	Noise	All vehicles and equipment would be equipped with required exhaust noise abatement suppression devices.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
85.	Noise	Construction and maintenance activities would be consistent with local noise ordinances.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
86.	Paleontological Resources	Preconstruction surveys of sensitive paleontological areas may be conducted, as agreed upon by the appropriate land-managing agencies and Western.	Prior to the start of construction activities		Prior to the start of construction activities		WESTERN	WESTERN
87.	Socioeconomics	Any land temporarily required for construction of the proposed facilities (such as conductor pulling sites and material and equipment storage areas) would be arranged through temporary-use permits or by specific arrangements between the construction contractor and affected landowners. Arrangements would be made with business owners to avoid or minimize disruptions in their business (by posting detours and limiting the area and time of disruption).	Prior to the start of construction activities		Prior to the start of construction activities		WESTERN	WESTERN

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EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
88.	Socioeconomics	Where new ROW is needed, Western would acquire land rights (easements) in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646), as amended. Easements would be purchased through negotiations with landowners at fair market value, based on independent appraisals. The landowner would normally retain title to the land and could continue to use the property in ways that would be compatible with the transmission line.	Prior to the start of construction activities		Prior to the start of construction activities		WESTERN	WESTERN
89.	Soils	Erosion control measures would be implemented to prevent loss of soil. Construction would be in conformance with Western's Integrated Vegetation Management Environmental Guidance Manual.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
90.	Soils	If wet areas cannot be avoided, Western would use wide-track or balloon tire vehicles and equipment and/or timber mats.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
91.	Soils, Water Resources, Wetlands	Construction vehicle movement outside of the ROW normally would be restricted to approved access or public roads.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
92.	Soils, Water Resources, Wetlands	Where feasible, all construction activities would be rerouted around wet areas while ensuring that the route does not cross sensitive resource areas.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN

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EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
93.	Soils, Water Resources, Wetlands	Dewatering work for structure foundations or earthwork operations adjacent to, or encroaching on, streams or watercourses would be conducted to prevent muddy water and eroded materials from entering the streams or watercourses.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
94.	Traffic	Prior to the start of construction, Western would submit traffic control plans to all agencies with jurisdiction of public roads that would be affected by construction activities.	Prior to the start of construction activities		Prior to the start of construction activities		WESTERN	WESTERN
95.	Traffic	Western would restrict all necessary lane closures or obstructions on major roadways associated with construction activities to off-peak periods to mitigate traffic congestion and delays.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
96.	Traffic	Western would ensure that roads or sidewalks damaged by construction activities would be properly restored to their preconstruction condition.		At the completion of project construction		At the completion of project construction	WESTERN	WESTERN
97.	Visual Resources	Transmission line construction design would use monopoles whenever possible, rather than lattice structures.	Prior to final design		Prior to final design		WESTERN	WESTERN
98.	Water Resources, Wetlands	Applicable permits, agreements, and certificates for construction in jurisdictional waters or wetlands would be obtained, e.g. from the USACE or RWQCB, as needed.	Prior to the start of construction activities		Prior to the start of construction activities		WESTERN	WESTERN
99.	Water Resources, Wetlands	Culverts would be installed where needed to avoid surface water impacts during construction of transmission line structures. All construction activities would be conducted in a manner to avoid impacts to water flow.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN

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EPM	Resource	Measure	Implementation Duration		Monitoring Duration		Responsibility	
			One-time	Ongoing	One-time	Ongoing	Implementation	Monitoring
100.	Water Resources, Wetlands	Runoff from the construction site would be controlled and meet RWQCB storm water requirements and the conditions of a construction storm water discharge permit. A storm water pollution prevention plan would be prepared and implemented.	Prior to the start of construction activities	Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN
101.	Wetlands	In areas where ground disturbance is substantial or where recontouring is required, vegetation restoration would occur.		Throughout the project construction period		Throughout the project construction period	WESTERN	WESTERN

CARB = California Air Resources Board
CDFG = California Department of Fish and Game
EPM = Environmental Protection Measures
EIR = Environmental Impact Report
EIS = Environmental Impact Statement
MM = Mitigation Measure
NBHCP = Natomas Basin Habitat Conservation Plan
NMFS = National Marine Fisheries Service
NRHP = National Register of Historic Places
NO_x = nitrogen oxides
PCCP = Placer County Conservation Plan
PM_{10} = particulate matter equal to or less than 10 microns in diameter
ROW = right-of-way
RWQCB = Regional Water Quality Control Board
SHPO = State Historic Preservation Office
USACE = U.S. Army Corps of Engineers
USFWS = U.S. Fish and Wildlife Service

GLOSSARY

air basin

A defined area in which airborne pollutants tend to circulate and mix.

alternating current (AC)

An electric current or voltage that reverses direction of flow periodically, as contrasted to direct current, and has alternately positive and negative values. Most electricity used in the United States today is alternating current.

ambient air quality

The normal or average prevailing quality of the surrounding air in a given area in terms of the type and amounts of various air pollutants present.

ambient noise level

The normal or average background noise level (usually recorded in decibels) within a given area for a certain period of time during the day.

ampere

A measure of electrical current flow.

area of potential effect

For cultural resources, the extent of land that could be altered by the proposed action or an alternative.

attainment area

A geographic region where the concentration of a criteria air pollutant does not exceed national ambient air quality standards.

balancing authority

A Balancing Authority is responsible for balancing resources such as generation and energy imports with load including operating reserves and managing the transmission system within the authority's boundaries in accordance with strict reliability standards established by the North American Electric Reliability Council (NERC) Reliability Standards and the Western Electricity Coordination Council (WECC). Balancing Authorities exist throughout the nation's interconnected transmission system and they work cooperatively with each other. SMUD is one of five Balancing Authorities in California.

cable

A conductor with insulation (single conductor cable) or a combination of conductors insulated from one another (multi-conductor cable). Cables up to 115 kV usually have solid-type insulation; cables rated 230 kV and above are oil-filled. A fiber optic cable consists of a bundle of glass or plastic threads, each of which is capable of transmitting data.

California Endangered Species Act

The California *Endangered Species Act* (CESA) Fish and Game Code §§ 2050 *et seq*. generally parallels the main provisions of the Federal *Endangered Species Act* and is administered by the California Department of Fish and Game. CESA prohibits the "taking" of listed species except as otherwise provided in State law. Unlike its Federal counterpart, CESA applies the take prohibitions to species petitioned for listing (state candidates).

California Environmental Quality Act

The California Environmental Quality Act (CEQA) (commencing with Public Resources Code Section 21000) requires local and state governments to consider the potential environmental effects of a project before deciding whether to approve it. CEQA's purpose is to disclose the potential impacts of a project, suggest methods to minimize those impacts, and discuss alternatives to the project so that decisionmakers will have full information upon which to base their decision.

California Natural Diversity Database (CNDDB)

A program that inventories the status and locations of rare plants and animals in California.

capacitor

Capacitor is an element used in electric power systems that is described through its principal function, which is to store electric energy. This property is called capacitance. In its simplest form, a capacitor is built with two conducting plates separated by a dielectric.

capacity

The maximum load that a generator, piece of equipment, substation, transmission line, or system can carry under existing service conditions. Sometimes used interchangeably with capability, although not a synonym.

carbon monoxide (CO)

A colorless, odorless gas which is the product of incomplete combustion when natural gas, oil, wood, coal, or other materials rich in carbon are burned.

Carbon monoxide interferes with the delivery of oxygen throughout the body.

cascading

1) In a power system, the tendency of a local line fault to trigger problems elsewhere on the system and lead to a widespread power outage. 2) In a transmission line, a succession of mechanical failures along the line caused by one event such as a broken insulator.

Central Valley Project (CVP)

A long-term general scheme for the use of the water of the Sacramento River basin in the north for the benefit of the farmlands of the San Joaquin Valley in the south, undertaken by the U.S. Bureau of Reclamation, starting in 1935.

circuit

A system of conductors through which an electric current is intended to flow; sometimes normally open paths that do not ordinarily conduct in a network can also be considered part of a circuit.

double-circuit

To place two separate electrical circuits (for alternating current, each circuit consists of three separate conductors or bundles of conductors) on the same transmission structures.

single-circuit

To place one electrical circuit that consists of three separate conductors or bundles of conductors on one tower.

City of Roseville

The city of Roseville (Roseville) is a load-serving entity and electric utility in the greater Sacramento area that serves approximately 50,000 electric customers in Placer County.

***Clean Air Act* (CAA)**

1) A 1963 Federal law, amended several times since, giving the Federal government powers to limit air pollution. 2) A term loosely applied to the *Air Quality Act* of 1967, which gave the Federal government a stronger regulatory role. An especially important effect was the development of standards based on concentrations of pollutants in air. (42 U.S.C. §§ 7401-7671)

***Clean Water Act* (CWA)**

A Federal law intended to restore and maintain the chemical, physical, and biological integrity of the nation's waters and secure water quality that provides for the protection and propagation of fish, shellfish, and wildlife, as well as for recreation in and on the water. (33 U.S.C. §§ 1251-1387)

cultural resources

Any nonrenewable evidence of human occupation or activity as seen in any district, site, building, structure, artifact, ruin, object, work of art, architecture, or natural feature that was important in human history.

Community Separator

The Community Separator is an open-space area used for creating community form and image, and a sense of place, which provides clear separation between communities, defines the transition between urban and rural uses, and provides gateways that define entrances to a city. A greenbelt is proposed from the Sutter and Sacramento County lines to approximately one mile south of the county lines to separate Sutter County and Sacramento City's Urban Reserve Area. The Urban Reserve is the area outside of Sacramento City's Sphere of Influence in which future development and extension of municipal services are contemplated but not imminent.

conductor

1) Any metallic material, usually in the form of wire, cable, or bar, suitable for carrying an electric current. 2) The wire(s) strung between transmission towers.

conservation

Synonymous with energy conservation, the reduction of electric energy consumption because of increases in the efficiency of production, distribution, and end use.

contaminant

Any substance or matter that has an adverse effect on air, water, or soil. Also see pollutant.

corona

A luminous electrical discharge due to the ionization of the air surrounding a conductor caused by a voltage gradient exceeding a certain critical value. Can be seen as bluish tufts or streamers surrounding the conductor or conductor hardware, and generally a hissing sound can be heard. Transmission-line corona varies with atmospheric conditions and is more intense during wet weather.

cultural resource

Any nonrenewable evidence of human occupation or activity as seen in any district, site, building, structure, artifact, ruin, object, work of art,

architecture, or natural feature that was important in human history.

current

1) In common usage, the flow of electric energy when an appliance or machine is turned on. 2) In technical sense, a term usually modified by an adjective, such as direct current, referring to the rate of electrical charge flowing through a conductor or circuit as compared to voltage (volts), which is the force or pressure that causes the current to flow; current and ampere are often used interchangeably.

decibel (dB)

1) A unit used to describe the strength or intensity of wave-propagated phenomena such as sound or transmitted signals. Technically, a logarithmic scale so used. 2) One dB equals the least sound level detectable by the human ear, while 70 dB is equivalent to busy traffic and 150 dB is equal to a nearby jet taking off.

deciduous

Plants that shed their leaves at the end of the growing season.

deformed

Any change in the original form or volume of rock masses produced by tectonic forces; folding, faulting, and solid flow are common modes of deformation. As an example, folding implies that a structure that originally was planar, like a sedimentary bed, has been bent. Horizontal or vertical forces in the earth's crust may produce the deformation. Another type of deformation can result when large rock masses glide down an inclined bedding plane, fault plane, or unconformity under the force of gravity.

delineation

The process by which the edge of a wetland is defined.

demand

1) In a consumer context, the amount of electricity used. 2) In a public utility context, the rate at which electric energy is delivered to or by a system over any designated period. Expressed in kW or MW, or in kVA or MVA. 3) The amount of electric energy, in kilowatts or megawatts, needed at any given time to meet a customer's or total system load.

demand-side management (DSM)

Reducing the load in a critical area of the electrical distribution system. Traditionally, this effort has included energy conservation measures and pre-arranged means to reduce specific customer load during times of high demand. Air-conditioning cycling programs are an example of a pre-arranged demand-side management tool. See load shedding.

Department of Energy

See U.S. Department of Energy.

dispatcher

1) Individual at a control center who monitor and control a power system. 2) At Western, dispatcher responsibilities include: operating the automatic generation control equipment to regulate the loading of the generators in the Federal power plants to help maintain scheduled system frequency and the scheduled power interchange with other utilities; issuing electrical clearances on the Western system for safe maintenance and repair of equipment; isolating system trouble and dispatching of maintenance forces to repair facilities and restore service; maintaining transmission voltage schedules.

distribution

The transport of electricity to ultimate use points, such as homes and businesses, from a source of generation or from one or more substations.

disturbance

Any occurrence that adversely affects normal power flow in a system, including a fault or loss of an interconnection carrying a large block of power.

double circuit

See circuit.

double-circuit structure

See structure configurations.

easement

The right, privilege, or interest obtained by a negotiated contract or condemnation to construct, maintain, and operate a right of way.

ecosystem

A community of organisms together with their physical environment, viewed as a system of interacting and interdependent relationships.

electric and magnetic fields (EMF)

Fields of force caused by electric voltage and current around the electric wire or conductor when an electric transmission line or any electrical wiring is in operation. Magnetic fields exist only when current is flowing. Electric fields are present in

electrical appliances and cords whenever they are plugged in.

electricity

1) The common term used for electric power and for electric energy (power designates the total electricity delivered and energy designates what is delivered over time). 2) A flow of electrons along a conductor from an area of high electric potential to an area of low potential and/or a waveform component of the electromagnetic spectrum.

electromagnetic

Of or pertaining to the magnetic forces produced in a surrounding medium by the flow of current in a conductor, as used in this document, meaning electric and magnetic fields.

emergent

A plant that is rooted below the water but has foliage that extends above the water level.

endangered species

Under the Endangered Species Act animals, birds, fish, plants, or other living organisms whose existence is determined to be in danger throughout all or a significant portion of its range because its habitat is threatened with destruction, drastic modification, or severe curtailment, or because of overexploitation, disease, predation, or other factors.

Endangered Species Act

The Endangered Species Act (ESA) was passed in 1973. The U.S. Fish and Wildlife Service (USFWS) administer terrestrial, fresh water species, and migratory birds, and the National Marine Fisheries Service administer marine species. The purpose of the ESA is to conserve the ecosystems upon which threatened and endangered species depend and to conserve and recover listed species. (16 U.S.C. §§ 1531-1599)

endemic

Native to, or belonging exclusively to, a certain region or habitat.

environmental assessment (EA)

A document that evaluates the possible environmental effects of a Federal agency's proposed action and provides sufficient evidence to determine whether an EIS or a finding of no significant impact (FONSI) is warranted. An EA is one means of compliance with NEPA.

environmental impact statement (EIS)

A document that examines the possible environmental effects of a Federal agency's proposed actions. A tool for decision-making, it describes the positive and negative effects of proposed actions and lists alternative actions.

Environmental protection measure (EPM)

Western developed environmental protection measures to reduce environmental consequences associated with construction activities.

erosion

1) The wearing away of land surface by wind or water that occurs naturally from weather or runoff but can be intensified by land-clearing practices related to such activities as farming, residential or industrial development, road building, or timber-cutting. 2) A material wear mechanism resulting from suspended particles in a flow stream of water or other fluid.

floodplain

The lowlands adjoining inland and coastal waters. A relatively flat and flood-prone area.

forbs

A broad-leaved herb other than a grass, especially one growing in a field, prairie, or meadow.

gauss (G)

A unit used to measure magnetic field strength. The intensity of the earth's magnetic field, near the surface of the earth, is on the order of one-half gauss.

generation

1) The act or process of producing electricity from other forms of energy, such as hydro, coal-fired steam turbines, or photovoltaic conversion systems. 2) The amount of electrical energy produced.

generator

1) In a power plant, the machine that converts mechanical energy to electrical energy. 2) A utility that owns or acquires the output of a generating resource.

grid

See transmission grid.

ground

A connection from electrical equipment to a ground mat or to the earth, used to ensure that the

equipment (housing or structure) would be at the same potential (voltage) as the earth.

ground wire

A protective wire strung above the conductors on a transmission line to shield the conductors from lightning; also called shield wire or overhead ground wire.

habitat

The place where a population (human, animal, plant, or microorganism) lives and its surroundings, both living and nonliving.

hazardous waste

The byproducts of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. Possesses at least one of the following characteristics: ignitability, corrosivity, reactivity, or toxicity. See also RCRA.

high voltage

Descriptive of transmission lines and electrical equipment with voltage levels from 100 kV through 287 kV.

hydrophytes

A plant that grows completely or partly submerged in the water, either rooted in the mud or floating without anchorage.

impact

Direct or indirect changes in the existing environment, whether beneficial or adverse, resulting from a specific act or series of acts.

insulator

A device, made of nonconducting material, used to give support to electrical conductors and shield them from ground or other conductors. An insulator inhibits the flow of current from the conductor to the earth or another conductor.

intermittent creek

A creek that ceases to flow, and becomes dry during periods of the year.

kilovolt (kV)

One kilovolt equals 1,000 volts.

lacustrine

Living or growing in or along the edges of lakes

lattice

Descriptive of structures and substation structures designed with skew as well as horizontal and vertical members.

lichen

A plant type consisting of a symbiotic fungus and algae, forming a crust-like, scaly growth found on rocks and trees.

lithology

Origin, formation, mineral composition, and classification of a rock or rock formation.

load

The amount of electric energy delivered or required at any specified point or points on a system. Load originates primarily at the energy-using equipment of consumers, such as heaters, air conditioners, lights, and motors.

load shedding

Cutting off the electric current on certain lines when the demand becomes greater than the supply.

magnetic field

The invisible lines of magnetic force produced by electric current flowing in a conductor, such as a transmission line, service wires in a house, or household appliances. Measured in terms of lines of force per unit area with the measurement unit being tesla (T) or gauss (G) (one tesla equals 10,000 gauss). Also see electric and magnetic fields.

mitigate

In environmental usage, to either reduce or avoid an adverse environmental effect through various measures that seeks to make the effect less severe, less obvious, or more acceptable.

National Electric Safety Code (NESC)

Written standards, providing basic requirements for the design, construction, maintenance, and operation of electric supply and communication lines, equipment, and supply stations in order to safeguard persons from hazards associated with those activities.

National Environmental Policy Act (NEPA)

A 1969 Federal law that requires evaluation of the environmental impact of Federally funded projects and programs. Generally requires an environmental assessment and/or an environmental impact statement be submitted to the Federal

government before a project can begin. (42 U.S.C. §§ 4321-4370)

National Marine Fisheries Service (NMFS)

An agency of the U.S. Department of Commerce that oversees ocean and river fish harvest limits and determines which stocks are to be listed as endangered or threatened under the *Endangered Species Act*.

National Pollutant Discharge Elimination System (NPDES)

A provision of the Clean Water Act that prohibits discharge of pollutants into Waters of the United States unless a special permit is issued by the EPA, a state, or (where delegated) a tribal government on an Indian reservation.

navigable waters

Defined by the Federal Water Pollution Control Act, Section 502, as navigable waters, interstate waters, interstate lakes, rivers, and streams that are used for recreation and commercial fishing.

network

1) A system of interconnected circuit components. 2) A system of transmission (or distribution) lines interconnected and operated so that any principal point has multiple sources of power supply.

new transmission

Actions within an alternative that would require construction of new transmission lines including acquisition of new rights of way, placement of new structures, construction of new access roads, and the related activities that accompany the operation of a power transmission line.

nitrogen dioxide (NO_2)

A reddish-brown gas that forms during high temperatures of combustion. Toxic at high concentrations reacting with moisture in the air to form nitric acid, which is highly corrosive to metals A key ingredient in the formation of photochemical smog and acid rain.

nonattainment area

A geographic area that does not meet one or more national air quality standards.

outage

In a power system, a period—scheduled or unexpected—during which the transmission of power stops or a particular power-producing facility ceases to provide generation.

overload

Operation of equipment in excess of its normal, full load rating or operation of a conductor in excess of ampacity, and if continued for a sufficient length of time, would cause damage or overheating.

palustrine

Of, pertaining to, or living in, a marsh or swamp; marshy.

particulates

Airborne particles including dust, smoke, fumes, mist, spray, and aerosols. Also see pollutant.

perennial

(Botany) A plant that lasts two seasons or more.

perennial creek

A creek that maintains water in its channel throughout the year.

photochemical reaction

A chemical reaction produced by the action of sunlight.

plasticity

Clay-like behavior of a soil when wet.

pollutant

A contaminant, such as sulfur dioxide, nitrous oxide, hydrocarbons, radionuclides, carbon monoxide, and lead, present in a concentration high enough to cause adverse effects to health or the environment.

pollution

The accumulation of wastes or byproducts of human or natural activity that occurs when wastes or byproducts are discharged faster than they can degrade, assimilate, or disperse by natural processes.

power system

1) In general, a group of one or more generating resources and connecting transmission lines operated under common management or supervision to supply load. 2) An entire interconnected electric power transmission and distribution network together with connected generating plants and loads.

prevention of significant deterioration (PSD) increment

Upper limits criteria pollutant concentrations allowed in clean air sheds. Established by the Environmental Protection Agency to protect existing air quality from being degraded significantly through

new developments, such as construction and operation of new air pollution sources.

prime farmland

Prime farmland meets all the criteria in the USDA publications: Soil Taxonomy, Agriculture Handbook 436; Soil Survey Manual, Agriculture Handbook 18; Rainfall-Erosion Losses from Cropland, Agriculture Handbook 282; Wind Erosion Forces in the United States and Their Use in Predicting Soil Loss, Agriculture Handbook 346; and Saline and Alkali Soils, Agriculture Handbook 60.

radio interference (RI)

Impairment of the reception of a wanted radio signal by an unwanted radio signal or disturbance, usually expressed in microvolts. Usually the result of partial electrical discharges (corona).

reactive organic gases (ROG)

Gaseous compounds made of carbon and hydrogen (used interchangeably with VOC); react with NO_x in the presence of sunlight to produce ozone (CARB reports data in terms of ROG).

realignment

Relocating an existing transmission line as part of an overall strategy to optimize the use of an existing right of way and allow for the possible use of the right of way for another transmission line.

reconductoring

The process of installing larger or improved conductors in place of existing conductors on existing towers/structures. In some cases, reconductoring incorporates changes to the existing structures to provide the necessary structural capability to support larger conductors.

record of decision (ROD)

The document notifying the public of a decision taken by a Federal agency on a proposed action, together with the reasons for the choices entering into that decision.

reliability

1) The measure of the ability of a power system to provide uninterrupted service, even while that system is under stress. 2) In a relay or relay system, a measure of the degree of certainty of correct performance. Denotes certainty of correct operation together with assurance against incorrect operation from all extraneous causes.

right of way (ROW)

An easement for a certain purpose over the land of another, such as the strip of land used for a road, electric transmission line, ditch, or pipeline. Western usually acquires easements for its transmission lines, roads, and other facilities such as guys and anchors. Road rights of way are usually acquired in 6- or 15-meter (20- or 50-foot) widths; for 230-kV transmission lines, the width of the ROW is usually 125 feet.

riparian

Habitat or areas, usually adjacent to rivers, streams, or lakes, where the vegetation and microclimate are heavily influenced by water.

residual impact

A significant impact that when mitigated still exceeds an established standard or threshold.

riprap

A loose assemblage of broken stones erected in water or on soft ground as a foundation.

rolling blackouts

A rolling blackout occurs when a power company turns off electricity to selected areas to save power. The areas are selected using sophisticated computer programs and models. The blackouts are typically for one hour, then the power is restored and another area is turned off. Hospitals, airport control towers, police stations, and fire departments are often exempt from these rolling blackouts. These blackouts usually occur during peak energy usage times, usually between 4 and 7 p.m. on weekdays, but can happen any time of day. Blackouts may affect the same area more than once a day, and may exceed an hour's duration.

Sacramento Municipal Utility District

SMUD is one of the greater Sacramento-area transmission system owners and an electric utility that serves approximately 565,000 electric customers in Sacramento County and small portions of Placer and Yolo counties.

scoping

For an environmental impact statement, the process of defining the range of issues requiring examination in studying the environmental effects of a proposed action, generally including public consultation with interested individuals and groups, as well as with agencies with jurisdictions over parts of the project area or resources in that area.

shield wire

Used to provide protection to a conductor from lightening strikes.

sink

A place in the environment where a compound or material collects.

siting

To situate or locate on a site.

slough

A stagnant or slow moving area of water connected to a larger body of water such as a marsh, inlet, or backwater.

State Implementation Plan (SIP)

State plans approved by the EPA for establishing, regulating, and enforcing air pollution standards.

structure

A broad-base latticed steel support for line conductors (as differentiated from a wood or steel pole structure or line).

sulfur dioxide (SO_2)

One of the gases composed of sulfur and oxygen produced by the combustion of fuels containing sulfur and a key ingredient in the formation of smog and acid rain.

surface water

1) All water naturally open to the atmosphere, such as rivers, lakes, reservoirs, streams, impoundments, seas, and estuaries. 2) Refers to all springs, wells, or other collectors, which are directly influenced by surface water.

swale

A low, sometimes, moist or marshy tract of land.

terrestrial

Living or growing on land; not aquatic: *a terrestrial plant or animal.*

thermal rating

The temperature that can be withstood by an object without losing structural or functional integrity.

threatened species

As defined in the *Endangered Species Act*, those species likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

traditional cultural property

A property that is eligible for inclusion on the National Register of Historic Places because of its association with cultural practices or beliefs of a living community that are important in maintaining the continuing cultural identity of the Native American community.

transformer

A device for transferring electrical energy from one circuit to another by magnetic induction, usually between circuits of different voltages. Consists of a magnetic core on which there are two or more windings. In power systems, most frequently used for changing voltage levels.

transmission

The bulk transport of electricity from large generation centers over significant distances to interchanges with large industries and distribution networks of utilities.

transmission grid

An interconnected network of transmission lines including associated equipment for the transfer of electric energy in bulk between points of supply and points of demand.

transmission line

A high-voltage, extra-high-voltage, or ultra-high-voltage power line used to carry electric power efficiently over long distances.

tributary

A stream or river that flows into a larger stream or river.

U.S. Army Corps of Engineers (USACE)

The builder and now the owner-operator of many of the Federal dams in the Sacramento and San Joaquin River Basins (as well as elsewhere in the U.S.).

U.S. Bureau of Land Management (BLM)

A Bureau within the DOI responsible for managing public lands, including resources such as timber, minerals, oil and gas, geothermal energy, wildlife habitat, endangered species, recreation and cultural values, and open space.

U.S. Bureau of Reclamation

A Bureau within the DOI responsible for operating and maintaining dams and numerous water resource projects in the western United States, for such purposes as irrigation and power production.

U.S. Department of Energy (DOE)

A Department established in 1977 by the *Department of Energy Organization Act* to consolidate the major Federal energy functions into one cabinet-level department that would formulate a comprehensive, balanced national energy policy. Responsible for regulatory, research, and marketing programs related to energy production and use.

U.S. Environmental Protection Agency (EPA)

The Federal agency created in 1970 to permit coordinated and effective governmental action for protecting the environment by the systematic abatement and control of pollution by integrating research, monitoring, standard setting, and enforcement activities.

U.S. Fish and Wildlife Service (USFWS)

An agency within the DOI responsible for guiding conservation, development, and management of U.S. fish and wildlife resources.

undeformed

The opposite of deformed. The rocks masses have not been subject to structural forces or have been relaxed on geologic materials that have been previously stressed.

utility

A public or private organization created for the purpose of selling or supplying for general public use water, electric energy, telephone service, or other items or services.

vernal pool

Ephemeral pools that dry up periodically, typically holding water for only a few days to months. Vernal pools are of particular concern because human development has destroyed most of the pools, and yet there are many endemic animal and plant species found in these pools. Some of these species are even listed as threatened or endangered under the *Endangered Species Act*, and others have been identified as species of concern by state and federal officials. In addition, new species are being identified as surveys of remaining pools are completed.

volatile organic compounds (VOC)

Organic chemicals that have a high vapor pressure and easily form vapors at normal temperature and pressure. VOCs are primary precursors to the formation of ground level ozone and particulate matter in the atmosphere which are the main ingredients of the air pollutant referred to as smog. (EPA reports data in terms of VOC).

volt (V)

The unit of electromotive force, or voltage, that if steadily applied to a circuit having a resistance of one ohm will produce a current of one ampere.

voltage

The driving force that causes a current to flow in an electric circuit. Voltage and volt are often used interchangeably.

voltage sag

A momentary decrease of more than 10 percent in voltage magnitude.

voltage support

Voltage support is provided by generators, transmission systems, and equipment within the system, designed to react during normal or contingency operating conditions and sudden changes in load and maintain the established power grid voltage requirements. If there are insufficient or ineffective voltage support devices in an area to support high transmission loading during normal or contingency operations, rotating blackouts could result.

waste minimization

The reduction in volume or quantity of hazardous waste by the entity responsible for generating the waste.

watershed

The land area that drains into a stream or lake.

Western

See Western Area Power Administration.

Western Area Power Administration (Western)

One of the DOE's four power marketing agencies. Headquartered in Golden, Colorado, its service area includes 15 central and western states.

wetlands

Areas that are inundated by surface water or groundwater often enough to support vegetation or aquatic life that requires saturated or seasonally saturated soil conditions, such as swamps, bogs, fens, marshes, and estuaries.

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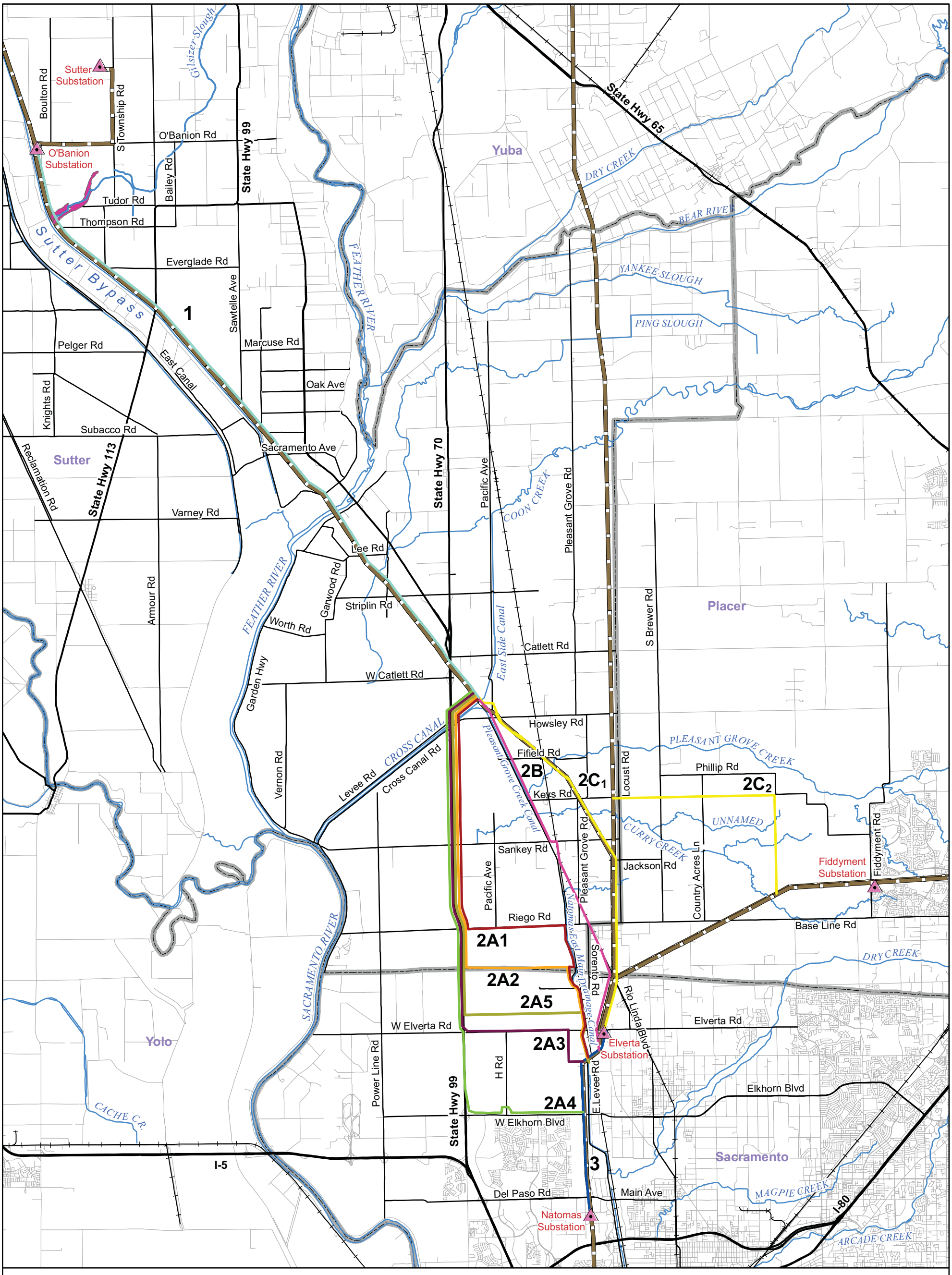

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SVS Segment

- 1
- 2A1
- 2A2
- 2A3
- 2A4
- 2A5
- 2B
- 2C1
- 2C2
- 3

- Existing Transmission Line
- Substation
- Road
- Railroad
- Watercourse
- CDFG Significant Area
- County

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure ES-2

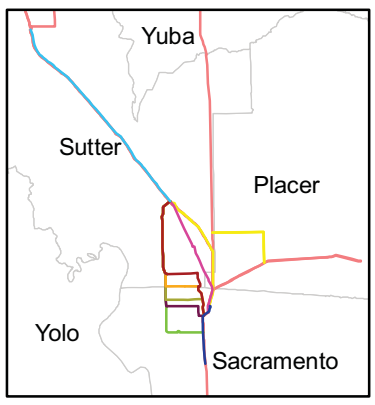
Route Segment Map

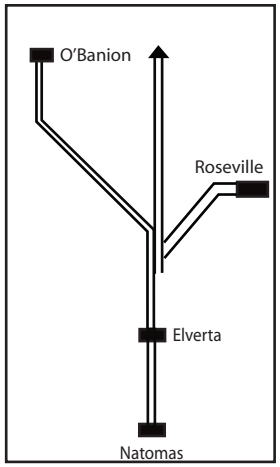
1:140,000

N

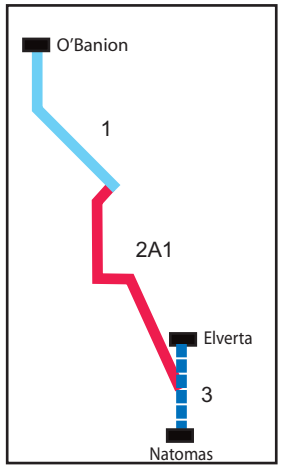
2 1 0 2

Miles

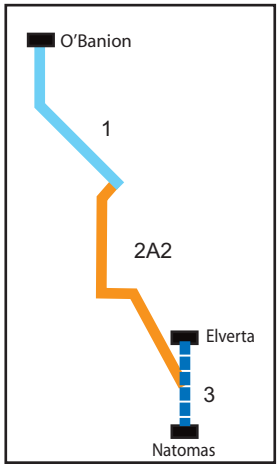




Existing 230-kV Transmission Line System No Action



Alternative A1



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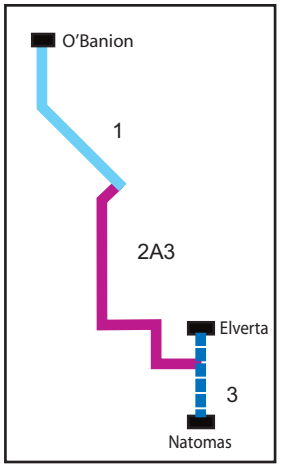

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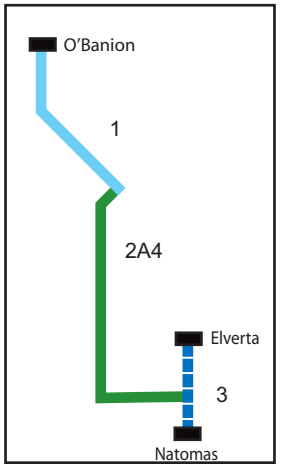

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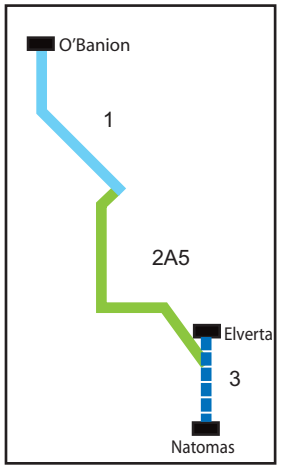

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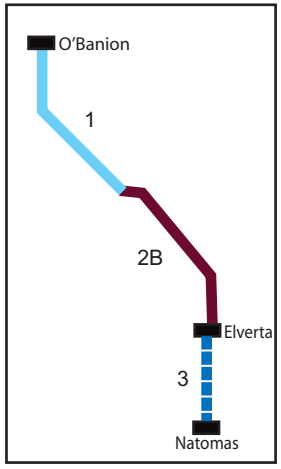
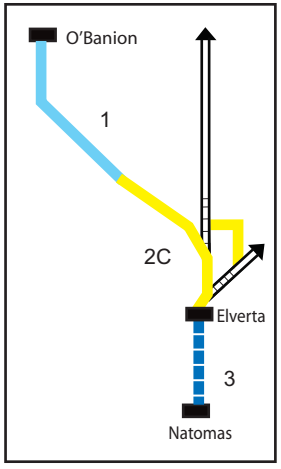


Alternative B



Alternative C

Existing 230-kV Transmission line

New Construction Within Existing ROW

New Construction Within New ROW

Abandonment

Substation

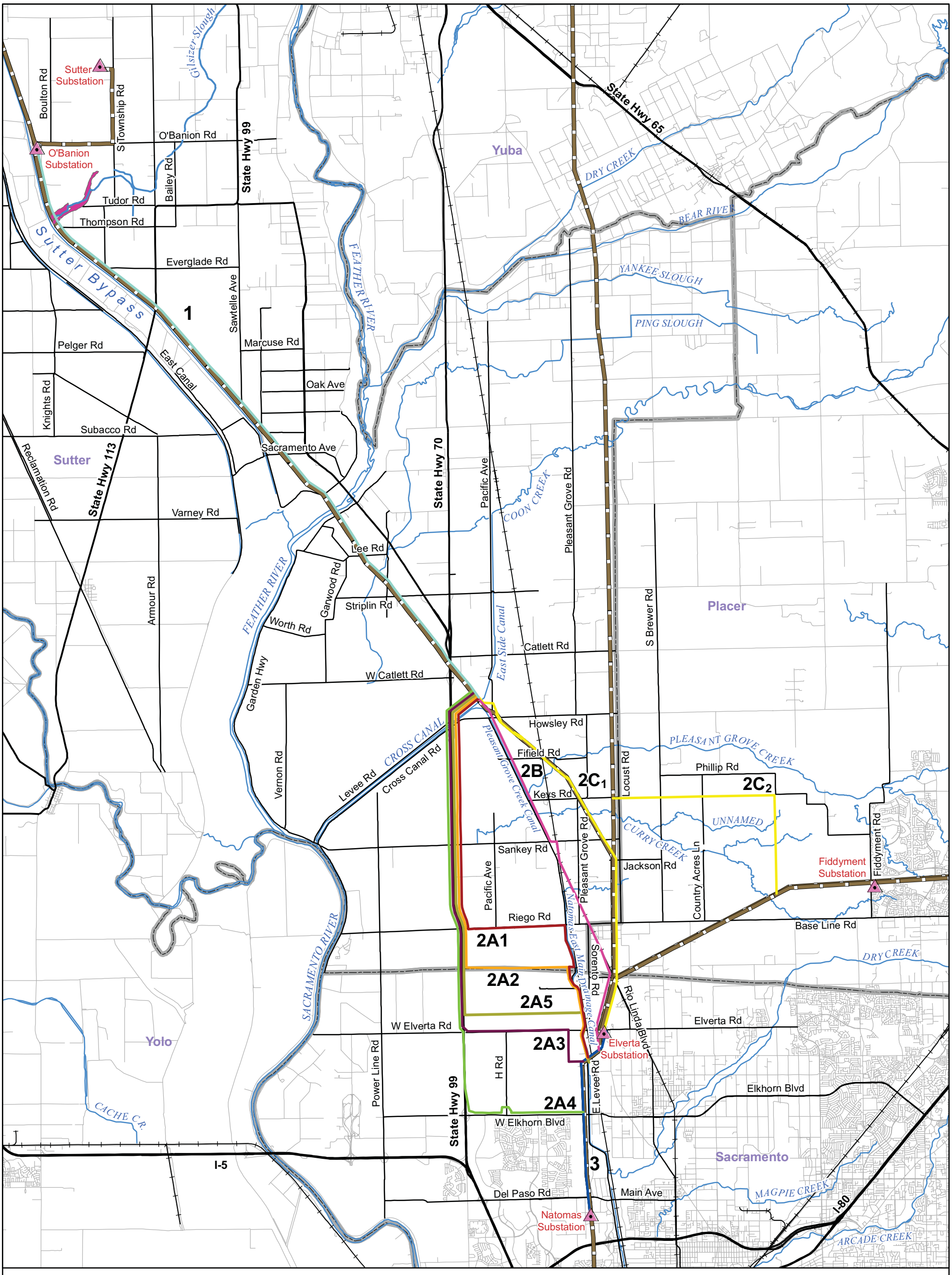
Notes:
- Colored segements correspond to route segments on Figure 3.1-3.

N

Figures not to Scale

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 3.1-2
General Layout of Alternatives



Source: SNR, GDT, California Spatial Information Library

SVS Segment

- 1
- 2A1
- 2A2
- 2A3
- 2A4
- 2A5
- 2B
- 2C1
- 2C2
- 3

- Existing Transmission Line
- Substation
- Road
- Railroad
- Watercourse
- CDFG Significant Area
- County

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 3.1-3

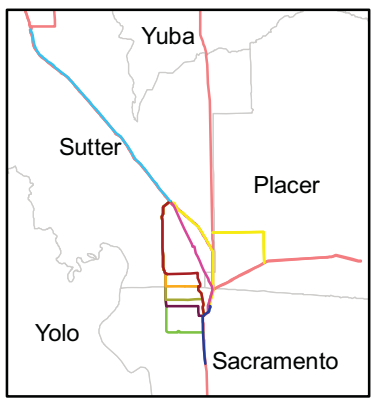
Route Segment Map

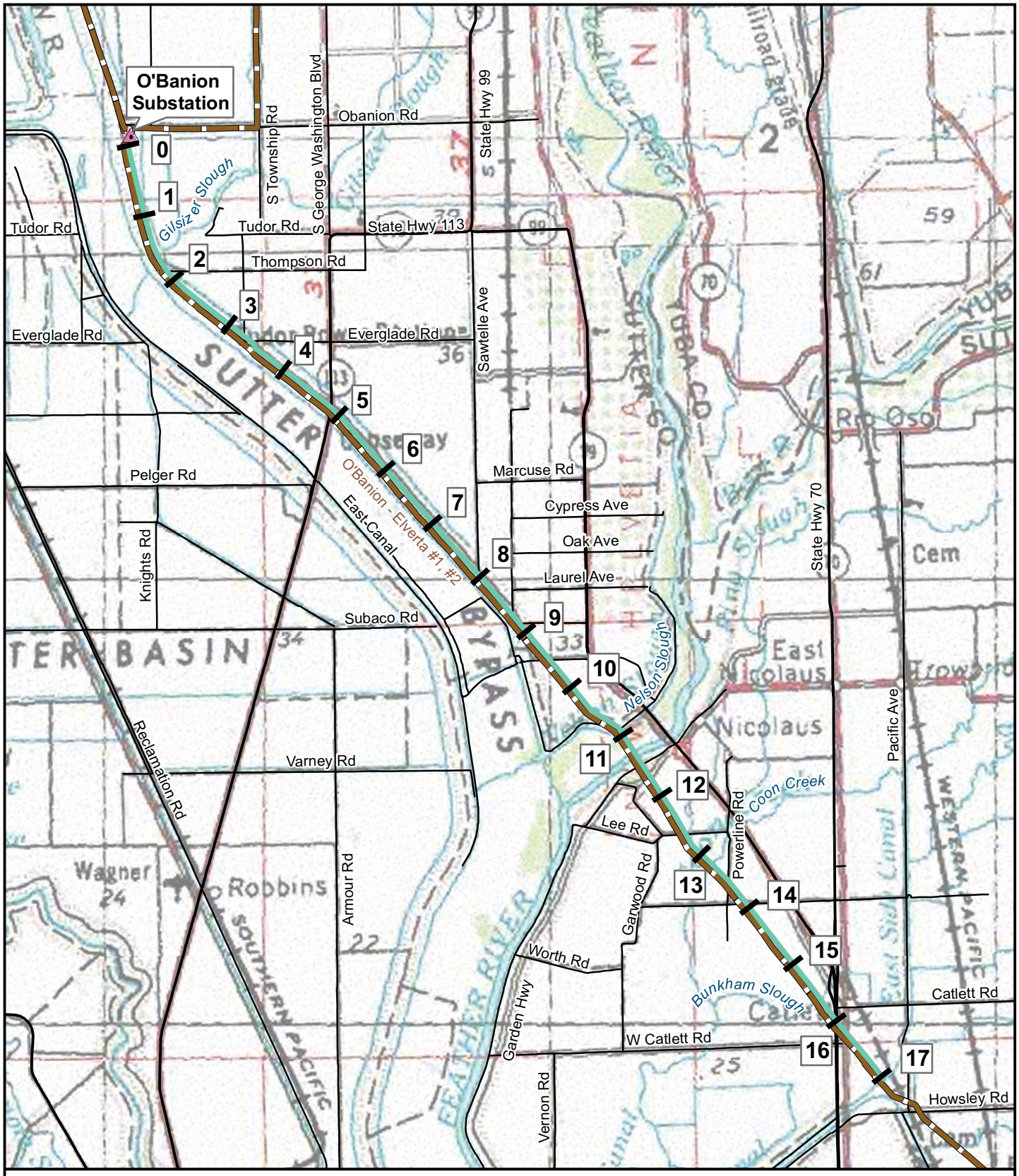
1:140,000

N

2 1 0 2

Miles





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- Segment 1
- Segment 2A1
- Segment 2A2
- Segment 2A3
- Segment 2A4
- Segment 2A5
- Segment 2B
- Segment 2C1
- Segment 2C2
- Segment 3
- Substation
- Existing Transmission Line
- Highway
- Road

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 3.1-4

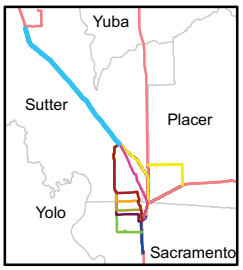
Segment 1

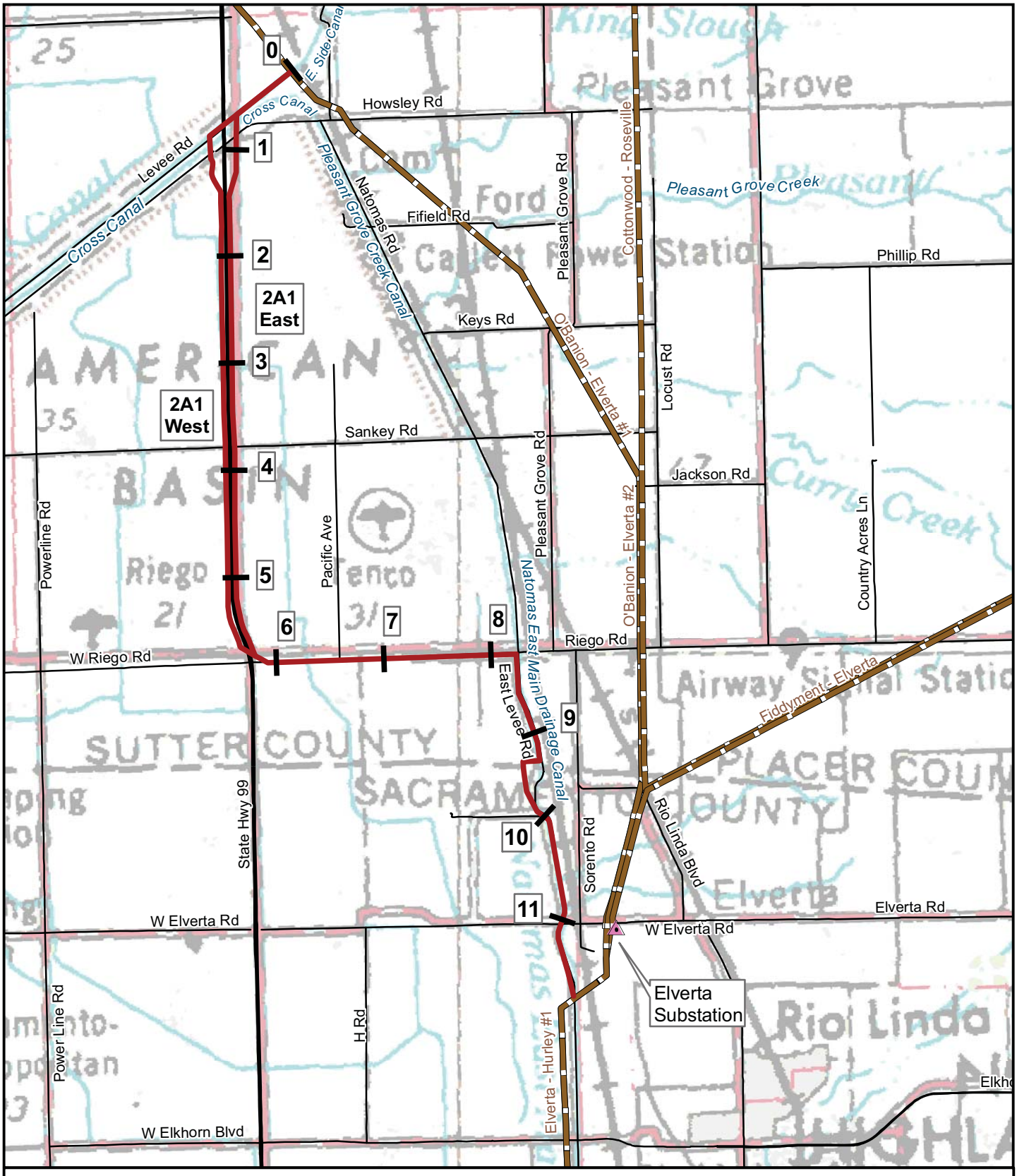
1:120,000

N

1 0.5 0 1

Miles





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Source: SNR, GDT, California Spatial Information Library

- Segment 1
- Segment 2A1
- Segment 2A2
- Segment 2A3
- Segment 2A4
- Segment 2A5
- Segment 2B
- Segment 2C1
- Segment 2C2
- Segment 3
- Substation
- Existing Transmission Line
- Highway
- Road

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 3.1-5

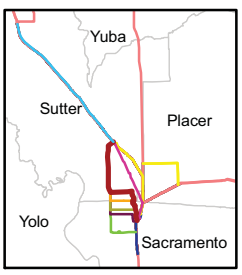
Segment 2A1

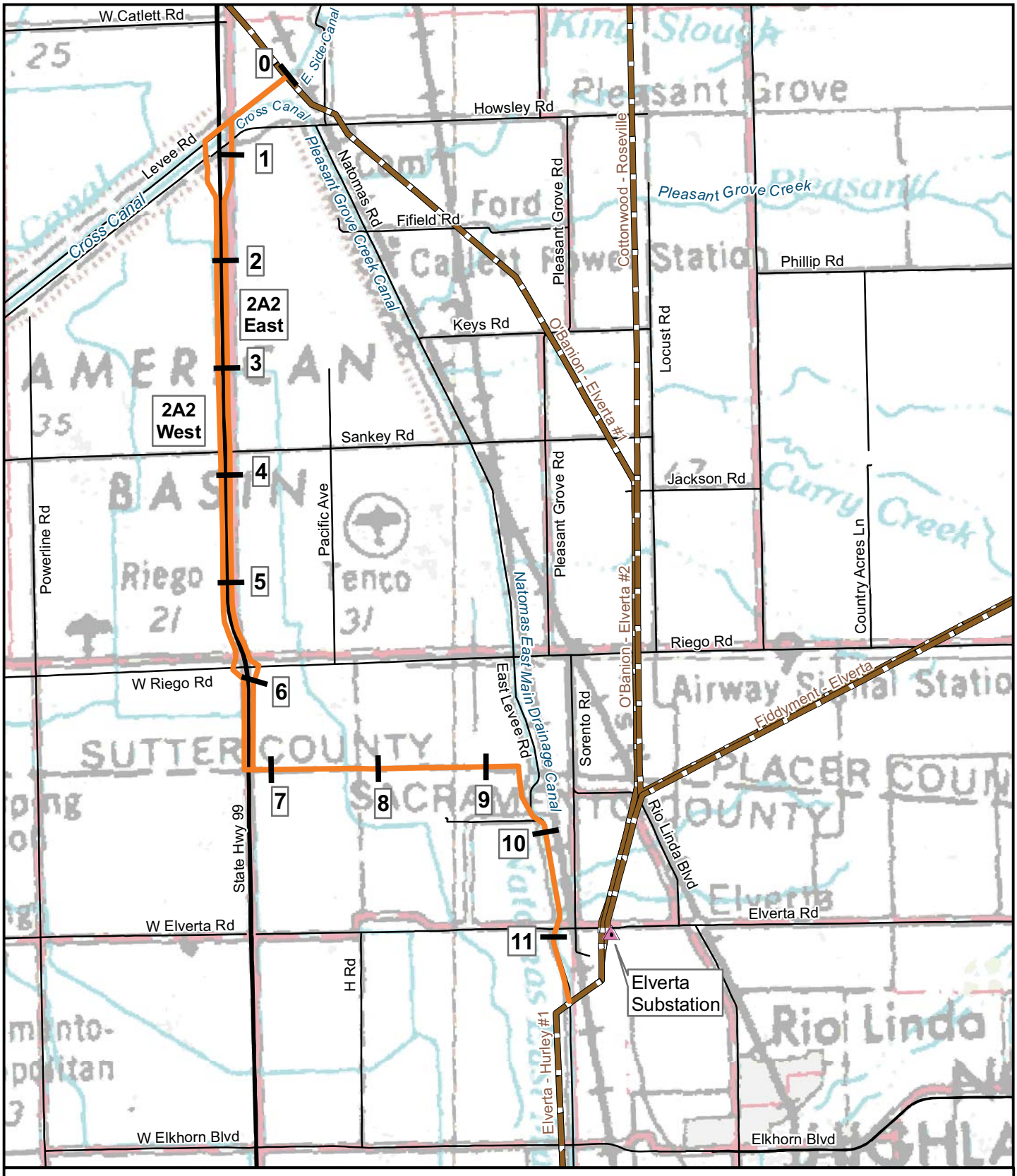
1:80,000

N

1 0.5 0 1

Miles





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Source: SNR, GDT, California Spatial Information Library

- Segment 1
- Segment 2A1
- Segment 2A2
- Segment 2A3
- Segment 2A4
- Segment 2A5
- Segment 2B
- Segment 2C1
- Segment 2C2
- Segment 3
- Substation
- Existing Transmission Line
- Highway
- Road

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 3.1-6

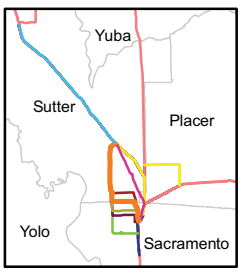
Segment 2A2

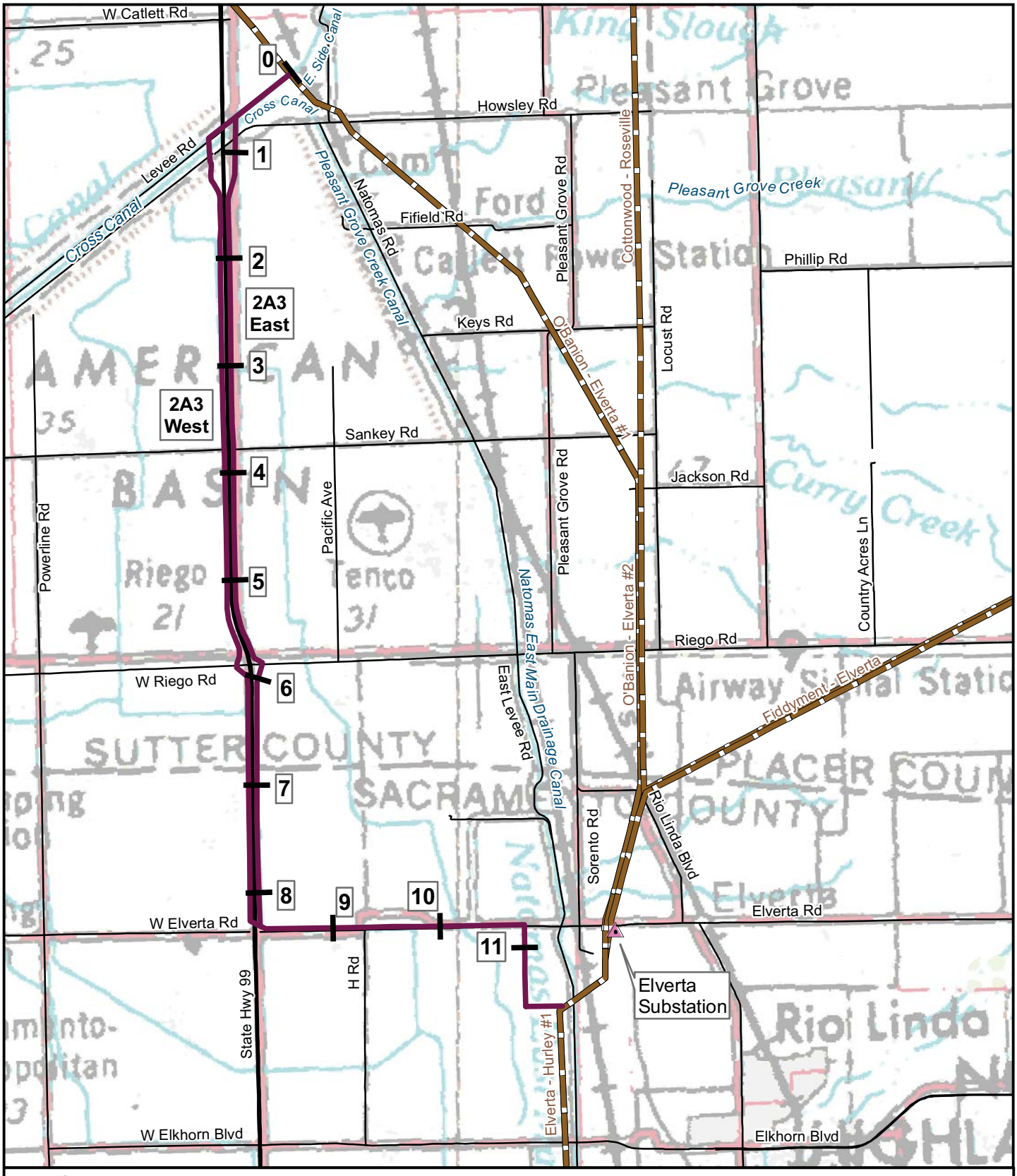
1:80,000

N

1 0.5 0 1

Miles





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Source: SNR, GDT, California Spatial Information Library

- Segment 1
- Segment 2A1
- Segment 2A2
- Segment 2A3
- Segment 2A4
- Segment 2A5
- Segment 2B
- Segment 2C1
- Segment 2C2
- Segment 3
- Substation
- Existing Transmission Line
- Highway
- Road

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 3.1-7

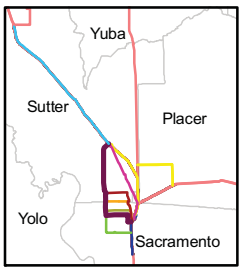
Segment 2A3

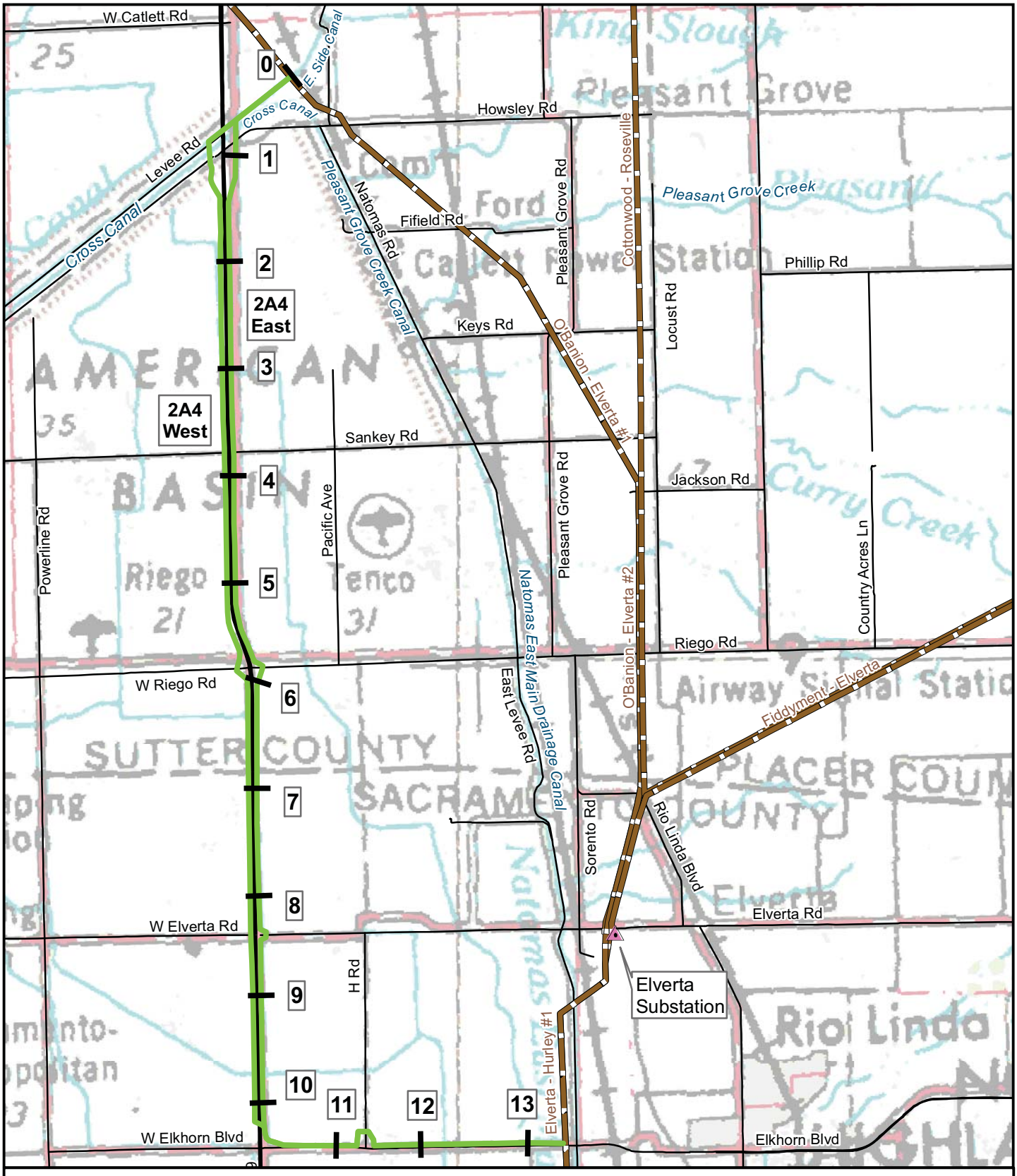
1:80,000

N

1 0.5 0 1

Miles





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Source: SNR, GDT, California Spatial Information Library

- Segment 1
- Segment 2A1
- Segment 2A2
- Segment 2A3
- Segment 2A4
- Segment 2A5
- Segment 2B
- Segment 2C1
- Segment 2C2
- Segment 3
- Substation
- Existing Transmission Line
- Highway
- Road

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 3.1-8

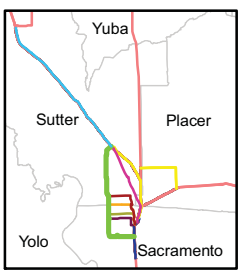
Segment 2A4

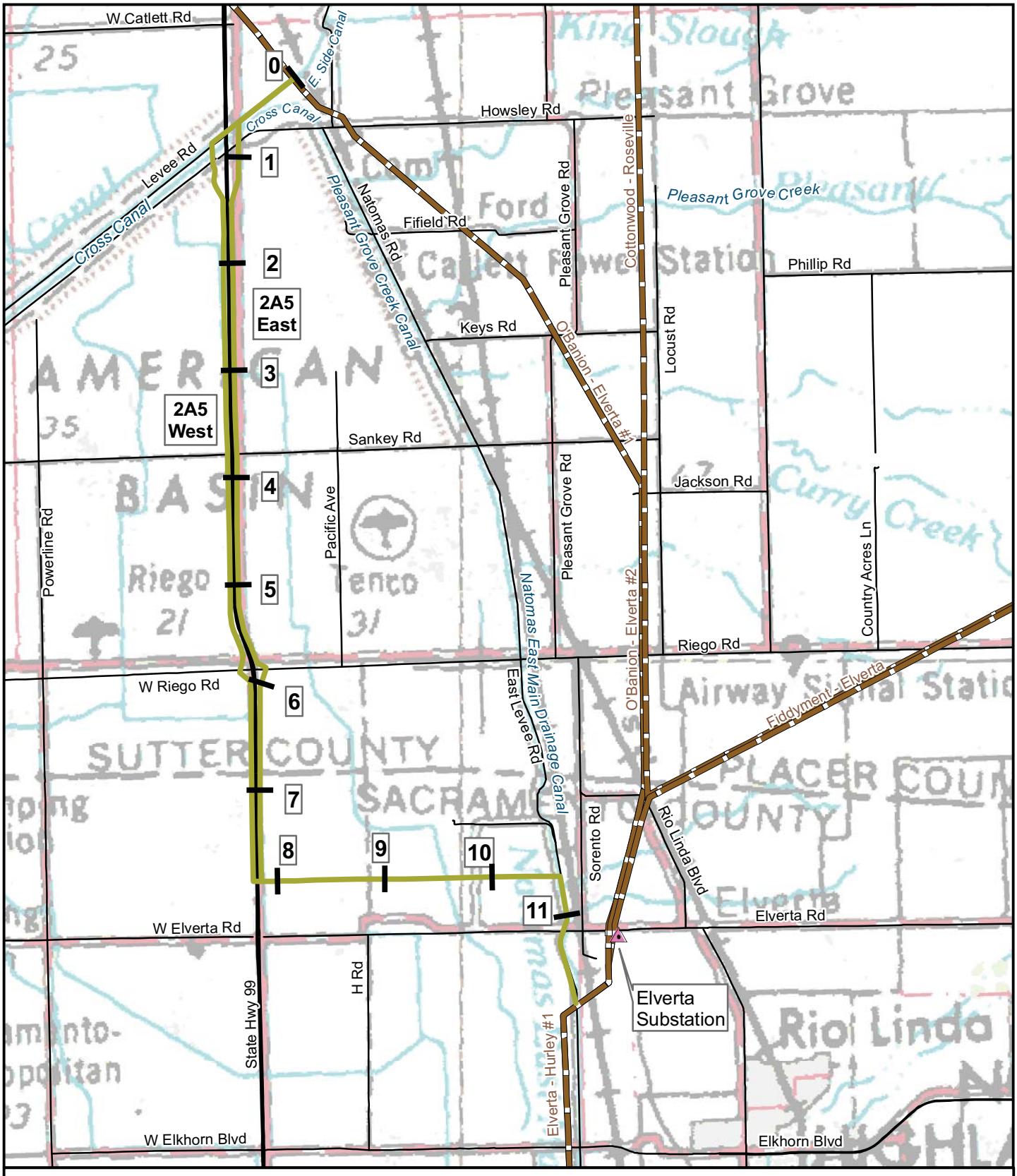
1:80,000

N

1 0.5 0 1

Miles





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Source: SNR, GDT, California Spatial Information Library

- Segment 1
- Segment 2A1
- Segment 2A2
- Segment 2A3
- Segment 2A4
- Segment 2A5
- Segment 2B
- Segment 2C1
- Segment 2C2
- Segment 3
- Substation
- Existing Transmission Line
- Highway
- Road

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 3.1-9

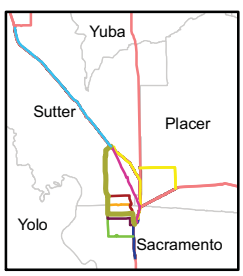
Segment 2A5

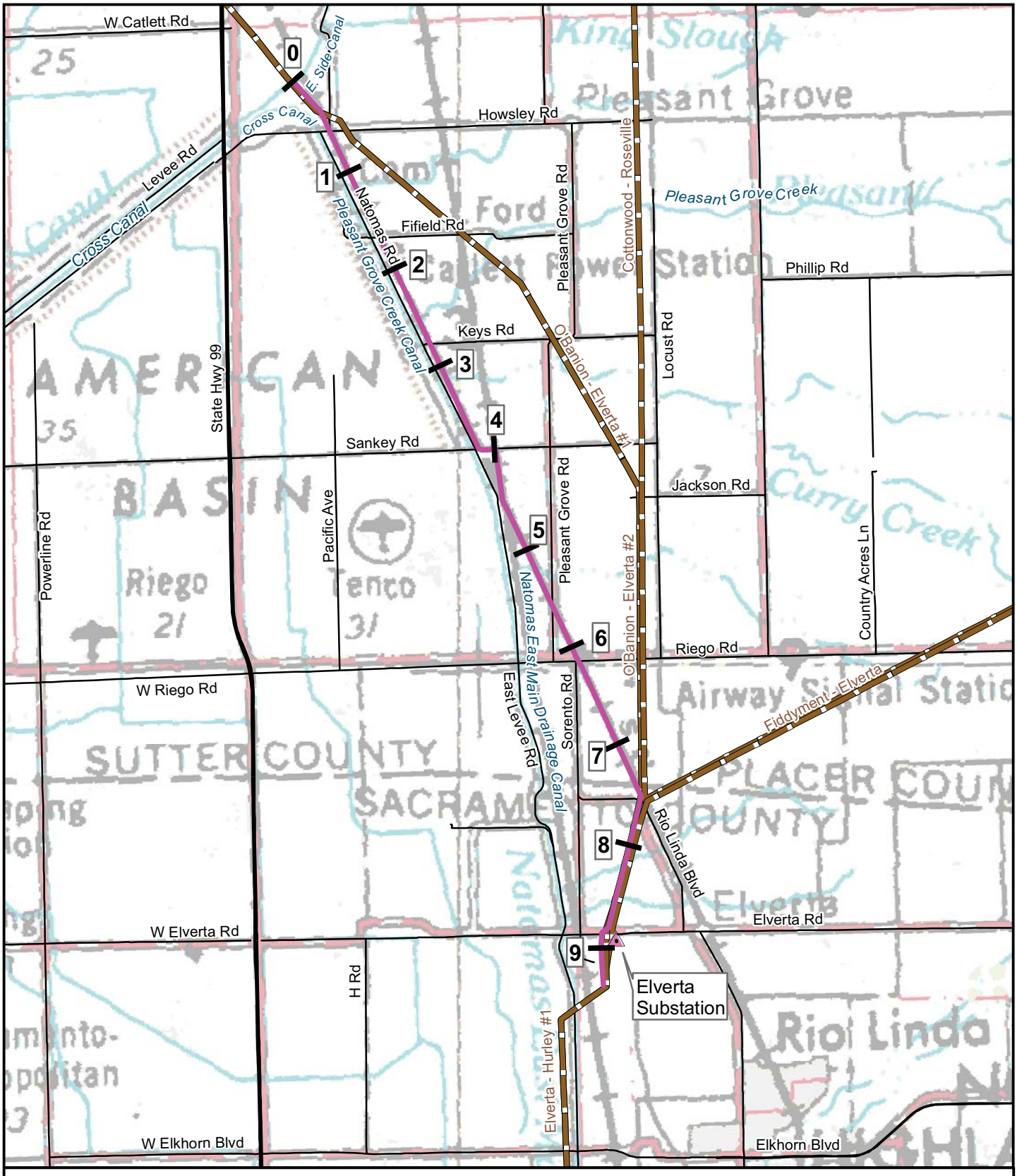
1:80,000

N

1 0.5 0 1

Miles





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Source: SNR, GDT, California Spatial Information Library

- Segment 1
- Segment 2A1
- Segment 2A2
- Segment 2A3
- Segment 2A4
- Segment 2A5
- Segment 2B
- Segment 2C1
- Segment 2C2
- Segment 3
- Substation
- Existing Transmission Line
- Highway
- Road

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 3.1-10

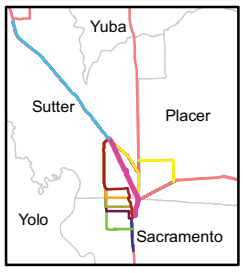
Segment 2B

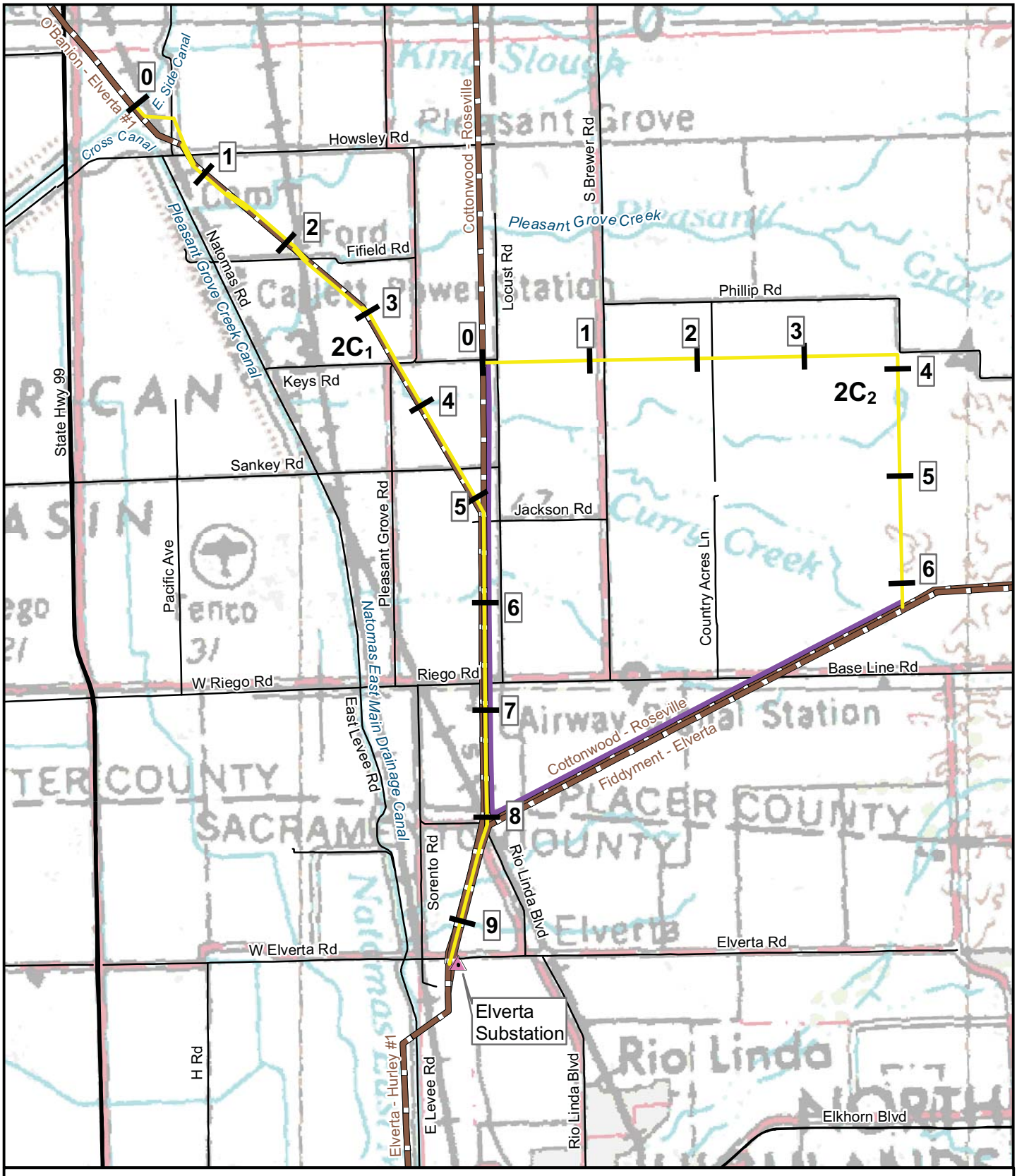
1:80,000

N

1 0.5 0 1

Miles





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Source: SNR, GDT, California Spatial Information Library

- Segment 1
- Segment 2A1
- Segment 2A2
- Segment 2A3
- Segment 2A4
- Segment 2A5
- Segment 2B
- Segment 2C1
- Segment 2C2
- Segment 3
- Substation
- Highway
- Road

Existing Transmission Line

- To Be Abandoned
- Transmission Line

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 3.1-11

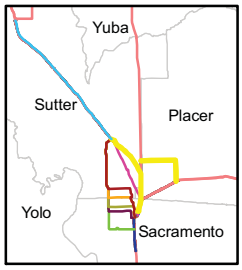
Segments 2C1 and 2C2

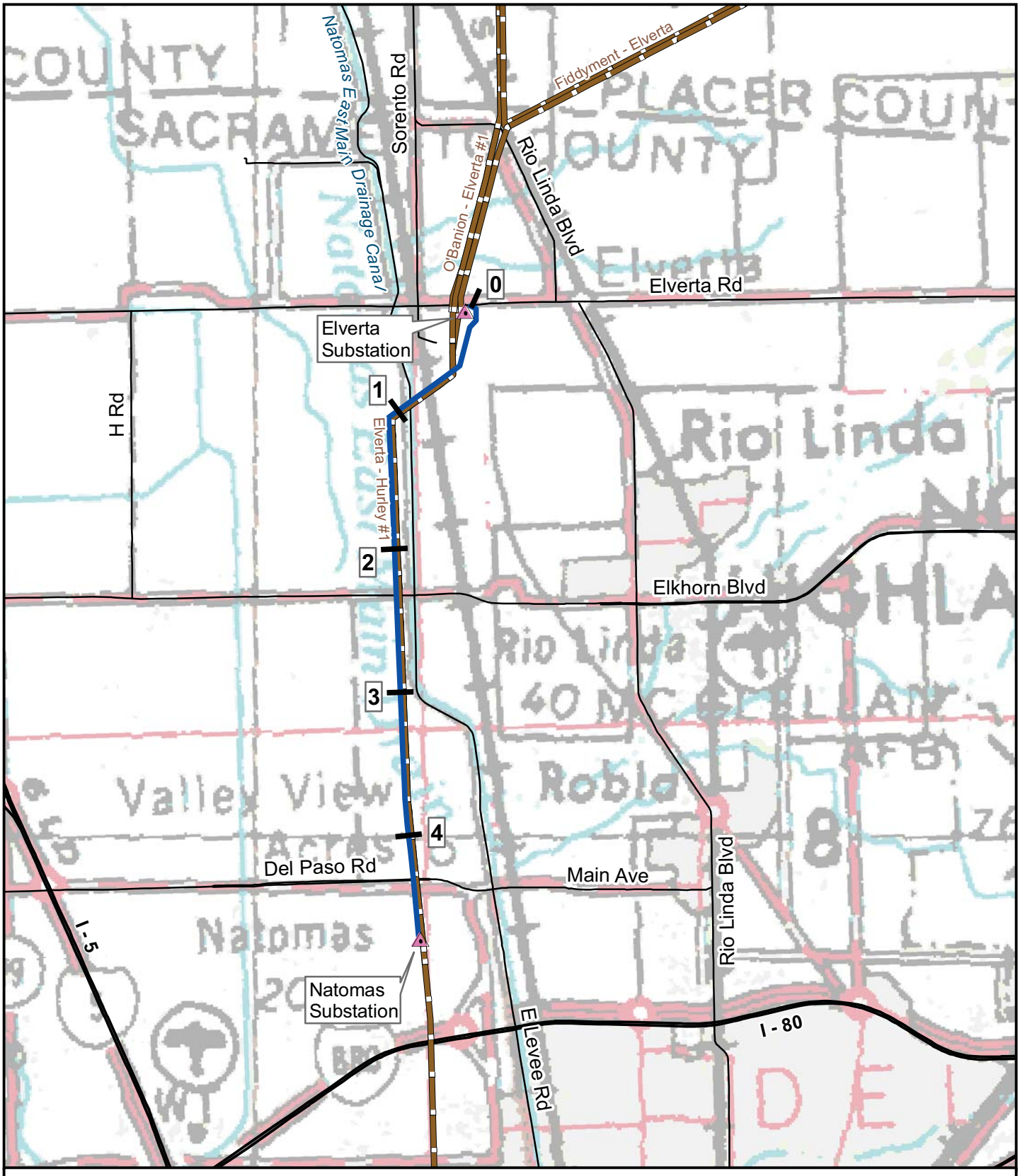
1:80,000

N

1 0.5 0 1

Miles





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Source: SNR, GDT, California Spatial Information Library

- Segment 1
- Segment 2A1
- Segment 2A2
- Segment 2A3
- Segment 2A4
- Segment 2A5
- Segment 2B
- Segment 2C1
- Segment 2C2
- Segment 3
- Substation
- Existing Transmission Line
- Highway
- Road

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 3.1-12

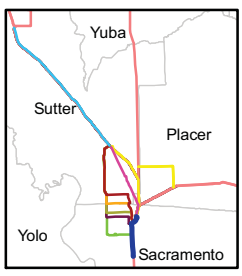
Segment 3

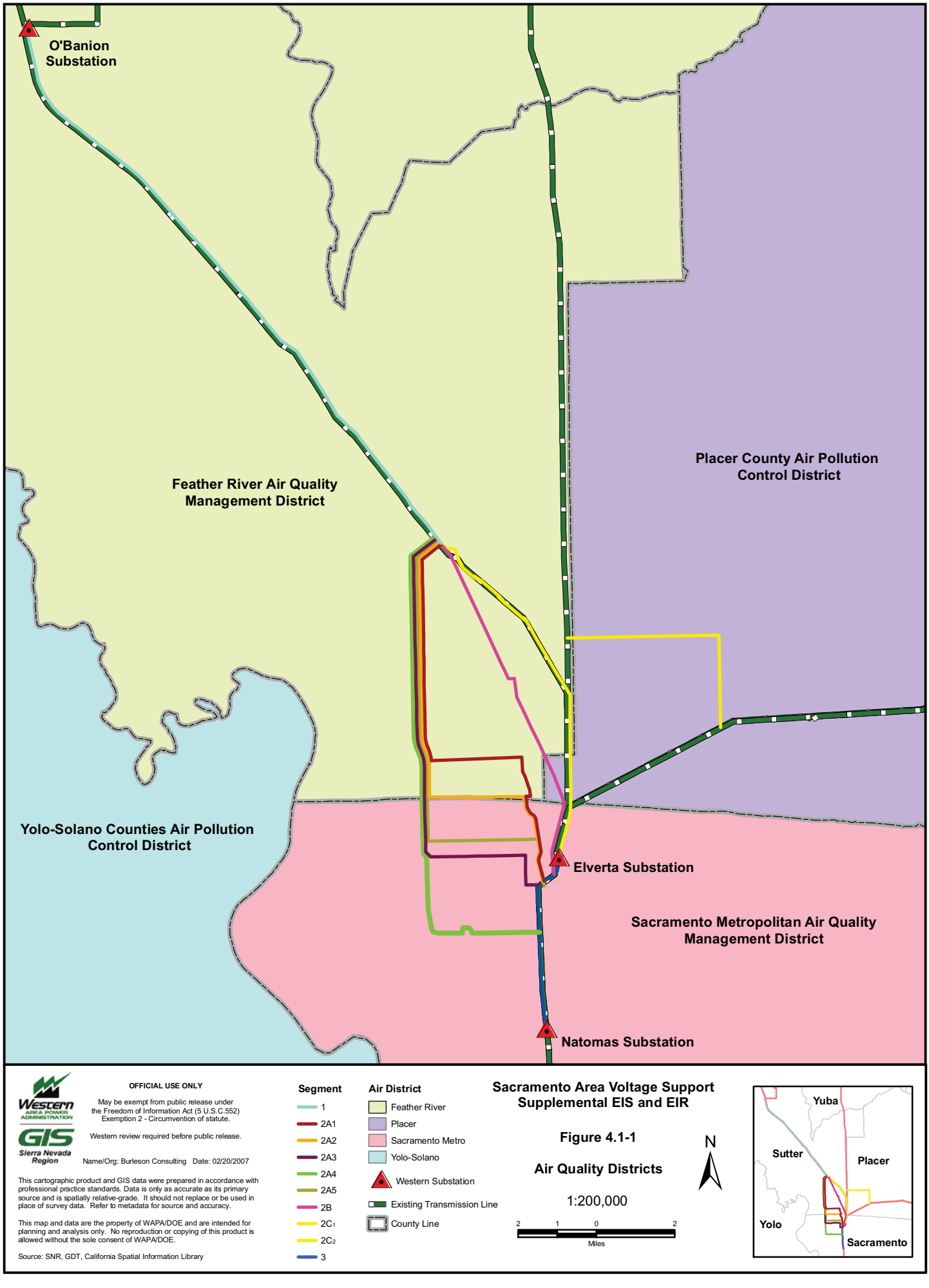
1:60,000

N

0.5 0.25 0 0.5

Miles




O'Banion Substation
Feather River Air Quality Management District
Placer County Air Pollution Control District
Yolo-Solano Counties Air Pollution Control District
Elverta Substation
Sacramento Metropolitan Air Quality Management District
Natomas Substation
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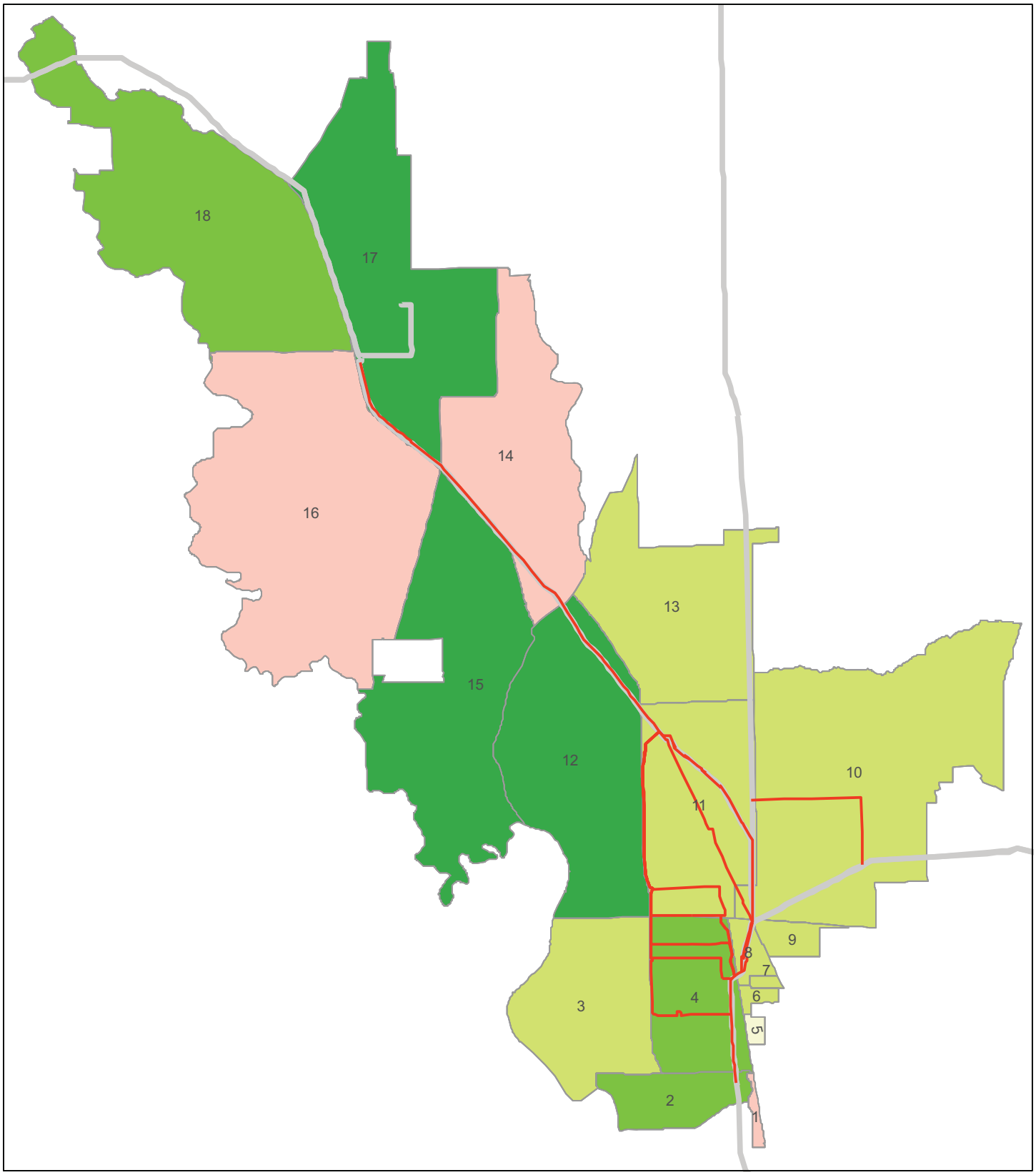
Source: SNR, GDT, California Spatial Information Library
Segment
1
2A1
2A2
2A3
2A4
2A5
2B
2C1
2C2
3
Air District
Feather River
Placer
Sacramento Metro
Yolo-Solano
Western Substation
Existing Transmission Line
County Line
Sacramento Area Voltage Support Supplemental EIS and EIR
Figure 4.1-1
Air Quality Districts
1:200,000
2 1 0 2
Miles
N
Yuba
Sutter
Placer
Yolo
Sacramento



Percent of minority population within Census Block Groups

- 0% - 12.5%
- 12.5% - 25%
- 25% - 37.5%
- 37.5% - 50%
- 50% - 62.5%
- 62.5% - 75%
- 75% - 87.5%
- 87.5% - 100%
- Proposed Lines
- Western Transmission Lines
- 3 Census Block Group ID Number

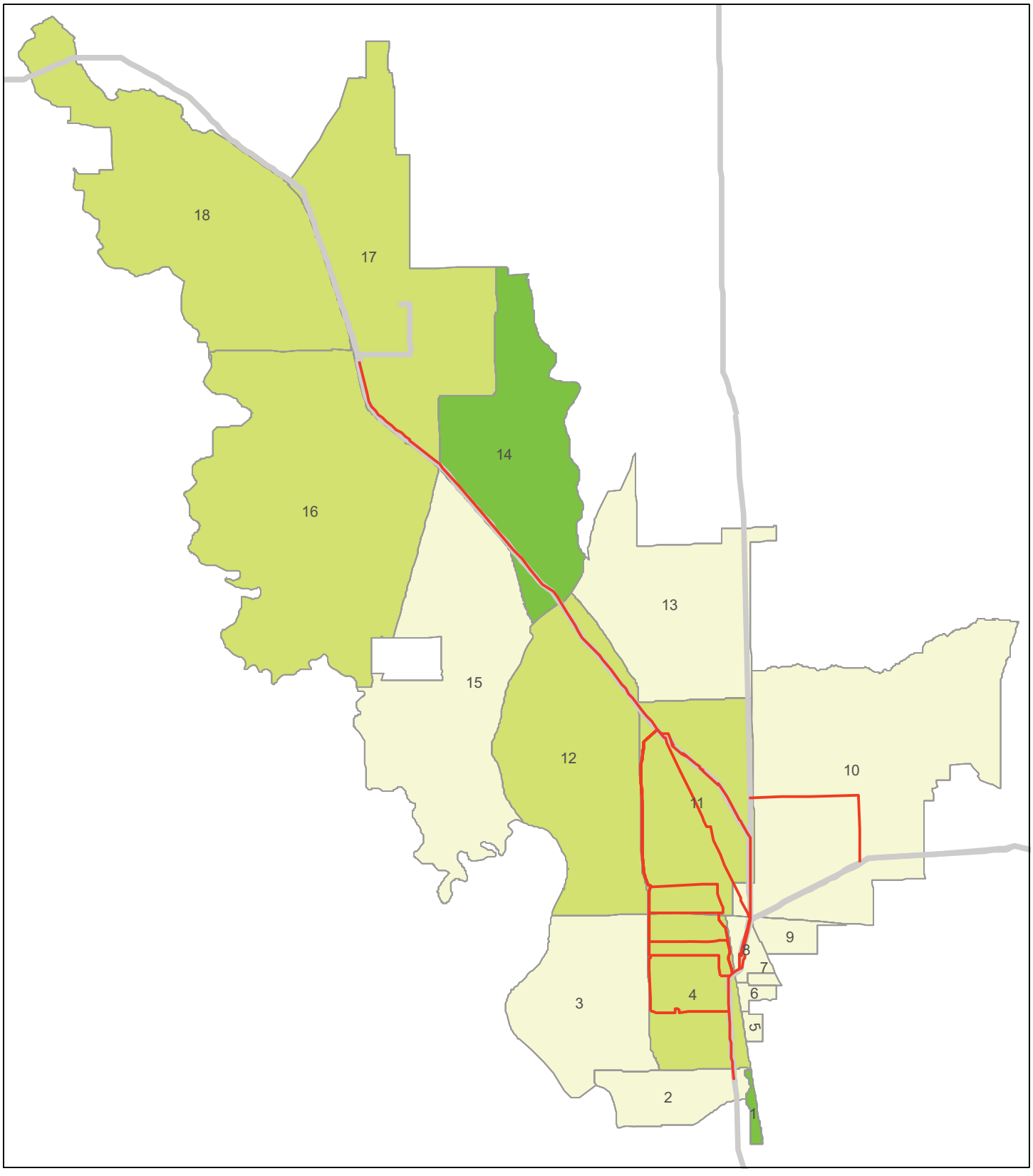
Sacramento Area Voltage Support
Supplemental EIS and EIR

Figure 4.5-1

Minority Population Distribution

N

2.5 1.25 0 2.5 5 Miles



Percent of low-income population within Census Block Groups

- 0% - 12.5%
- 12.5% - 25%
- 25% - 37.5%
- 37.5% - 50%
- 50% - 62.5%
- 62.5% - 75%
- 75% - 87.5%
- 87.5% - 100%
- Proposed Lines
- Western Transmission Lines
- 3 Census Block Group ID Number

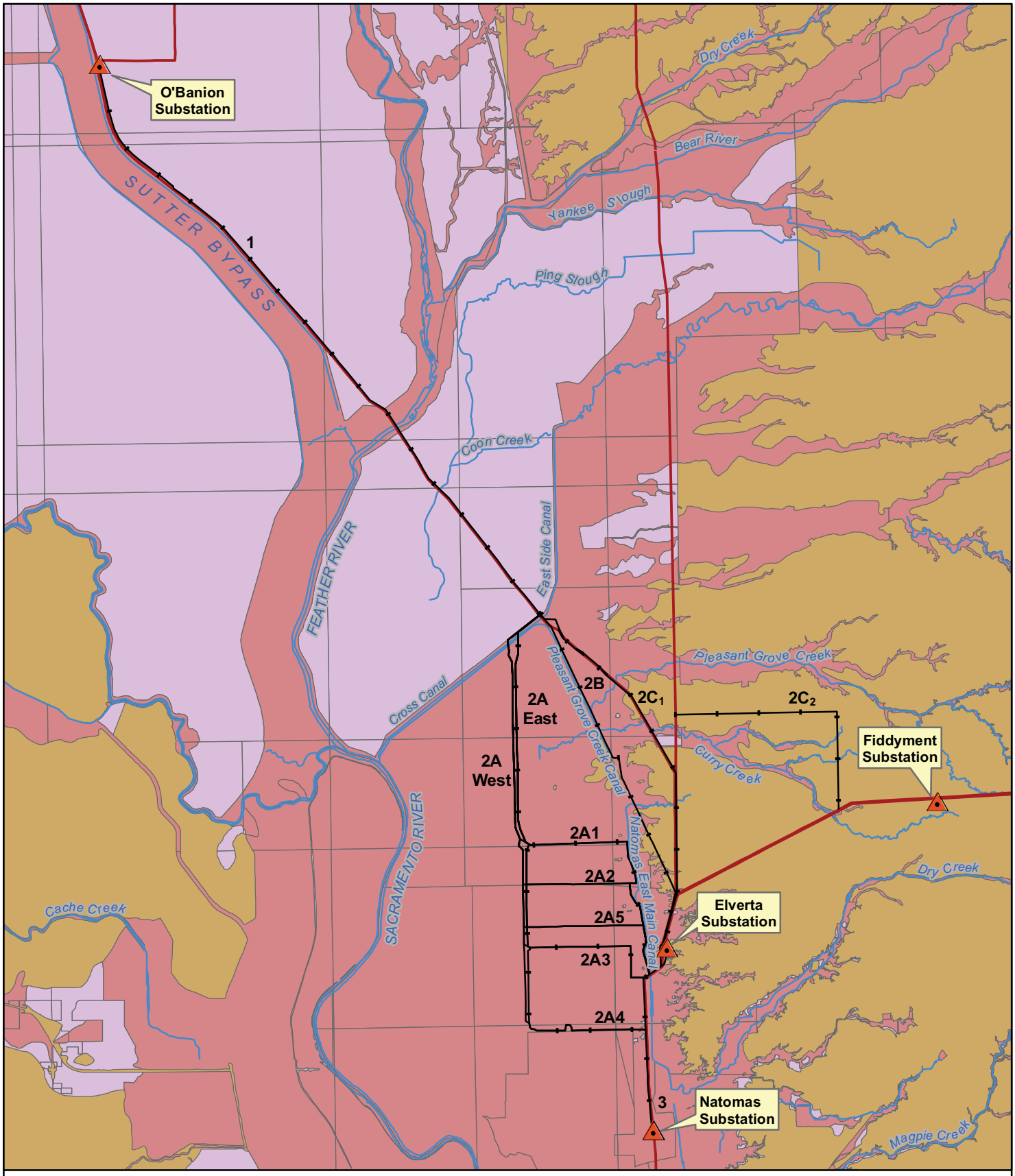
Sacramento Area Voltage Support
Supplemental EIS and EIR

Figure 4.5-2

Low-Income Population Distribution

N

2.5 1.25 0 2.5 5 Miles



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Source: SNR, GDT, FEMA, California Spatial Information Library

Floodplain Zone

- 100 Year
- 500 Year
- Proposed SVS Alignment
- Existing Transmission Line
- Watercourse
- Substation

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 4.6-1

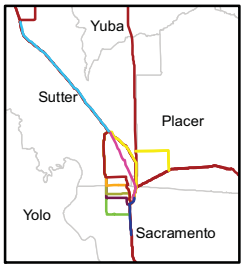
Floodplains Along All Segments

1:200,000

1 0.5 0 1 2 3

Miles

N



Source: SNR, GDT, USGS

- Qr — River deposits (Holocene)
- Qb — Floodbasin deposits (Holocene)
- QTc — Continental rocks and deposits (Miocene to Holocene)
- Well Location
- Fault Line
- Substation
- SVS Line
- Existing Transmission Line

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 4.7-1

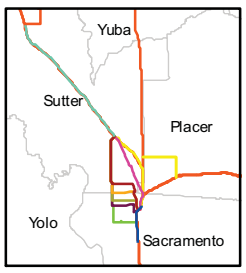
Geology Along All Segments

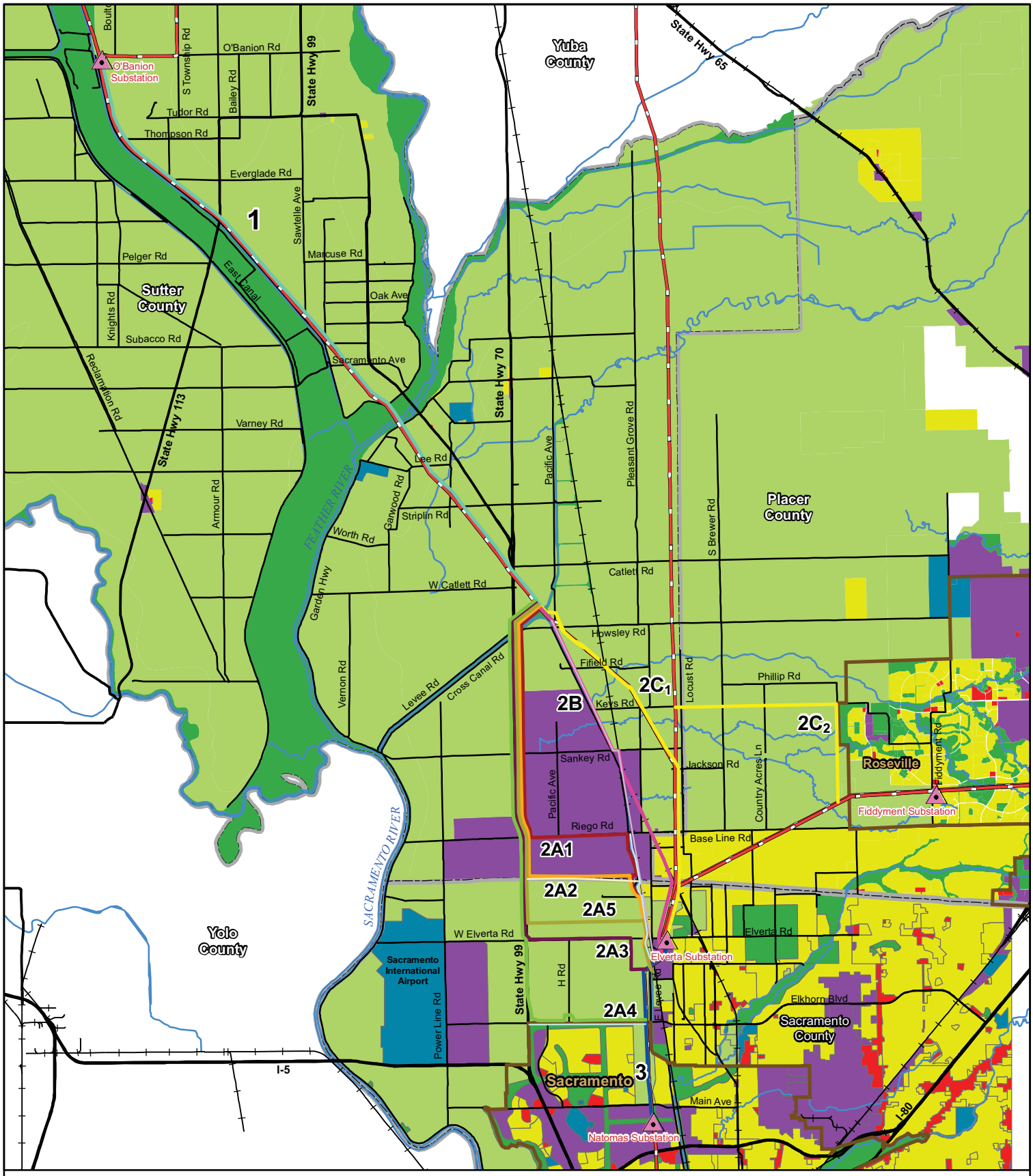
1:200,000

1 0.5 0 1 2 3

Miles

N





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Source: SNR, GDT, California Spatial Information Library, Sutter County, Placer County, Sacramento County

SVS Route

- 1
- 2A1
- 2A2
- 2A5
- 2A3
- 2A4
- 2B
- 2C1
- 2C2
- 3

Land Use

- Residential
- Civic
- Commercial
- Industrial
- Open Space
- Agricultural

- Sphere of Influence
- County
- Highway
- Road
- Railroad
- Existing Transmission Line
- Watercourse
- Substation

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 4.9-1

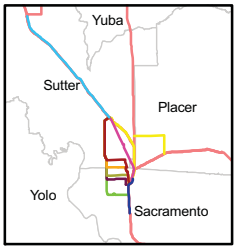
Land Use Designations

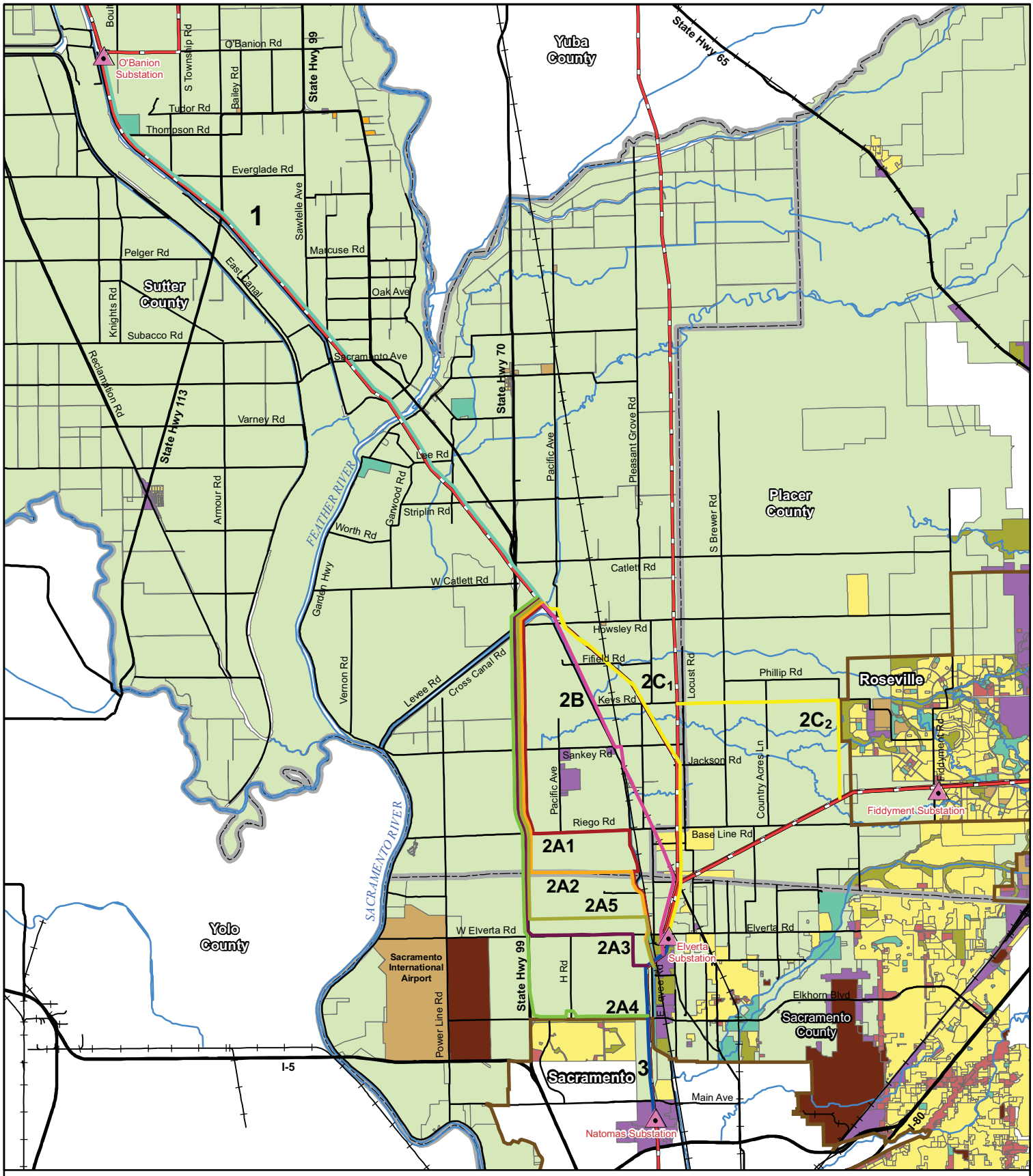
1:200,000

N

1 0.5 0 1 2 3

Miles





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Source: SNR, GDT, California Spatial Information Library, Sutter County, Placer County, Sacramento County

SVS Route
- 1
- 2A1
- 2A2
- 2A5
- 2A3
- 2A4
- 2B
- 2C1
- 2C2
- 3

Zoning
- Agricultural
- Industrial
- Commercial
- Residential
- Ranchette/Estate
- Open Space
- Parks/Recreation
- Public
- Special

- County
- Sphere of Influence
- Existing Transmission Line
- Highway
- Road
- Railroad
- Watercourse
- Substation

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 4.9-2

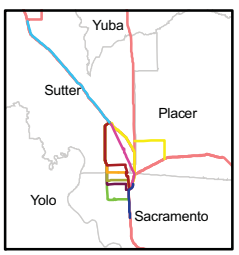
Zoning

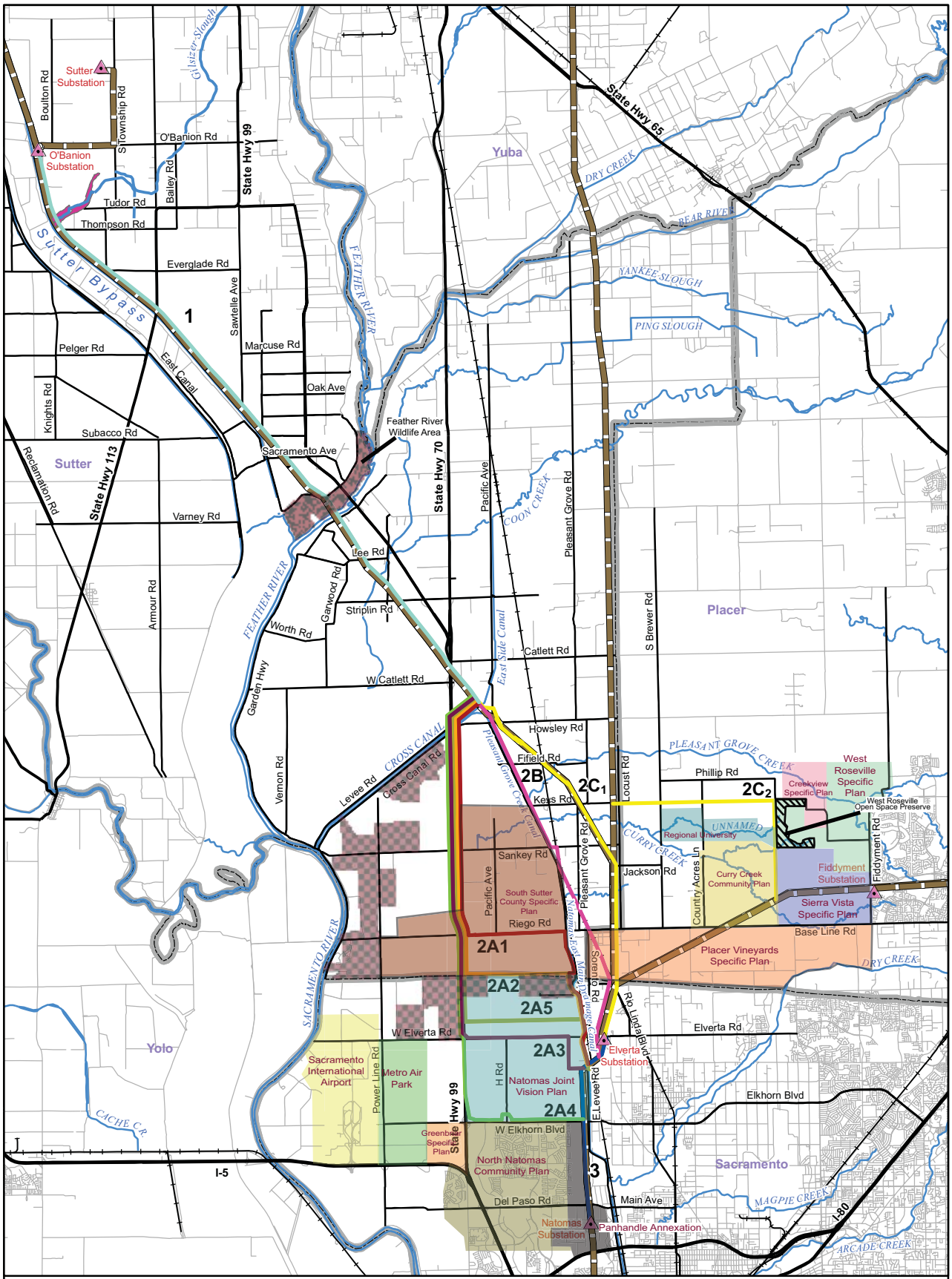
1:200,000

1 0.5 0 1 2 3

Miles

N





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Source: SNR, GDT, California Spatial Information Library

SVS Segment

- 1
- 2A1
- 2A2
- 2A3
- 2A4
- 2A5
- 2B
- 2C1
- 2C2
- 3

- Existing Transmission Line
- Substation
- Road
- Railroad
- Watercourse
- CDFG Significant Area
- County
- The Natomas Basin Conservancy Properties Near Project

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 4.9-3

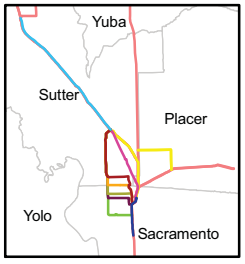
Existing Proposed Plans, Developments, and Sensitive Areas

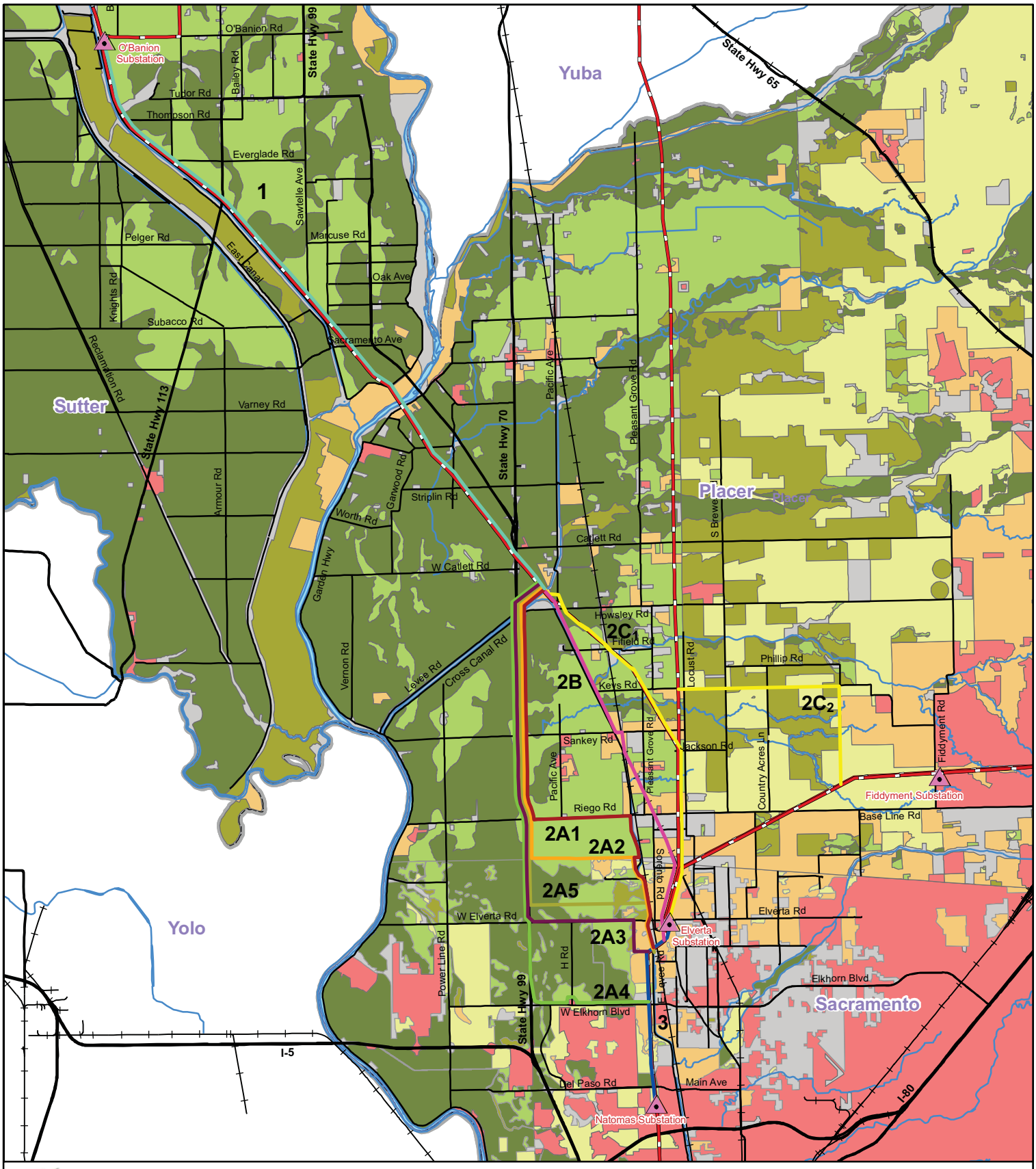
1:140,000

N

2 1 0 2

Miles





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Source: SNR, GDT, California Department of Conservation

SVS Route	Farmland		
1	Urban and Built-up Land	Highway	
2A1	Grazing Land	Road	
2A2	Farmland of Local Importance	Railroad	
2A5	Prime Farmland	Watercourse	
2A3	Farmland of Statewide Importance	County	
2A4	Unique Farmland	Existing Transmission Line	
2B	Water	Substation	
2C1	Other Land		
2C2			
3			

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 4.9-4

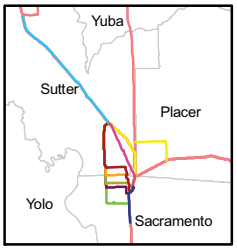
Prime and Unique Farmland

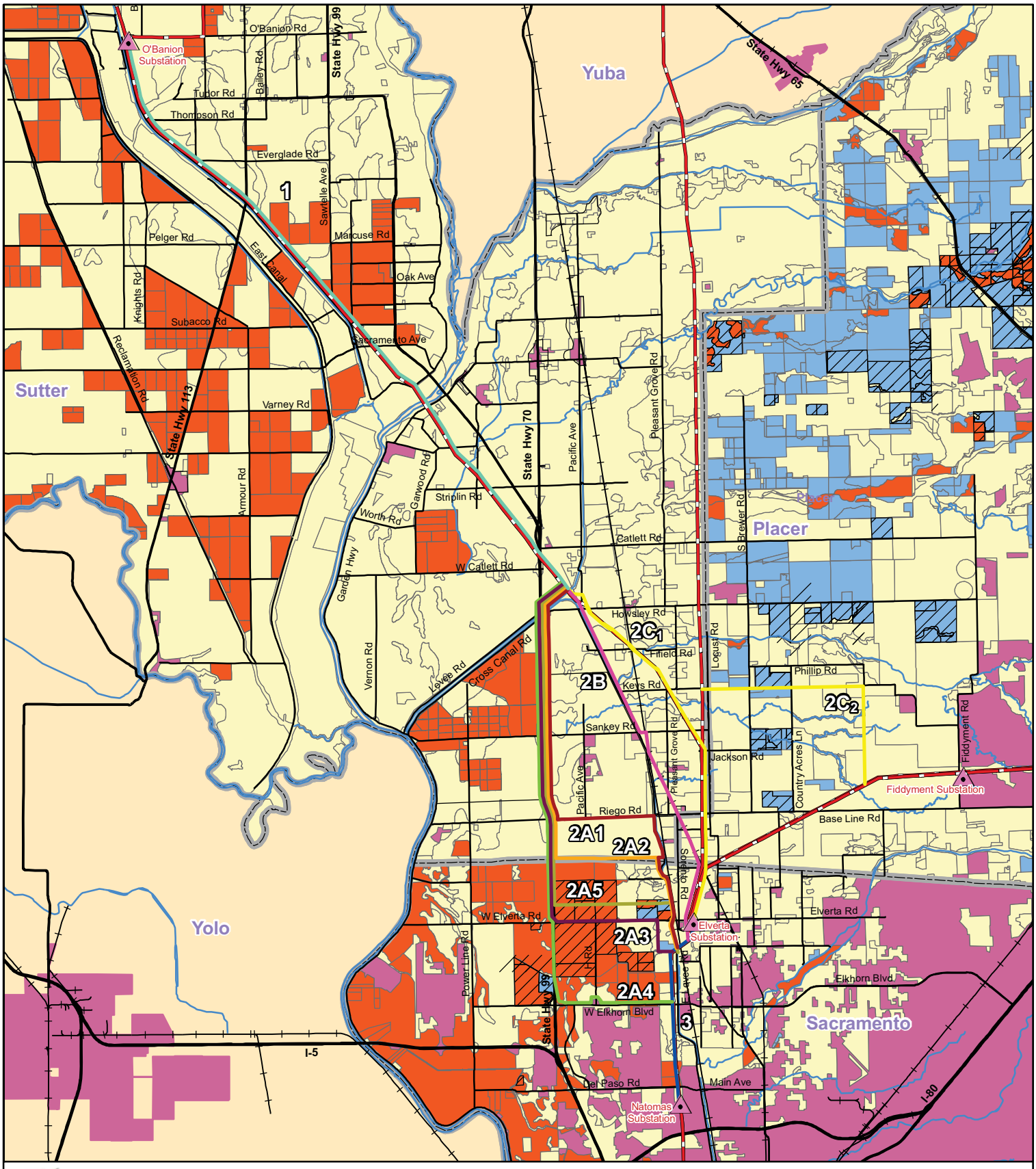
1:200,000

1 0.5 0 1 2 3

Miles

N





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Source: SNR, GDT, California Department of Conservation

SVS Route
- 1
- 2A1
- 2A2
- 2A5
- 2A3
- 2A4
- 2B
- 2C1
- 2C2
- 3

- Existing Transmission Line
- Substation
- Highway
- Road
- Railroad
- Watercourse
- County

Williamson Act Land
- Prime Agricultural Land
- Non-Prime Agricultural Land
- Non-Enrolled Land
- Urban and Built-up Land
- Agricultural Land in Non-Renewal

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 4.9-5

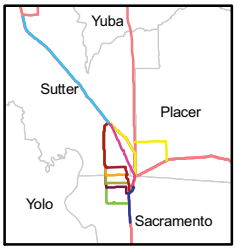
Williamson Act Farmland

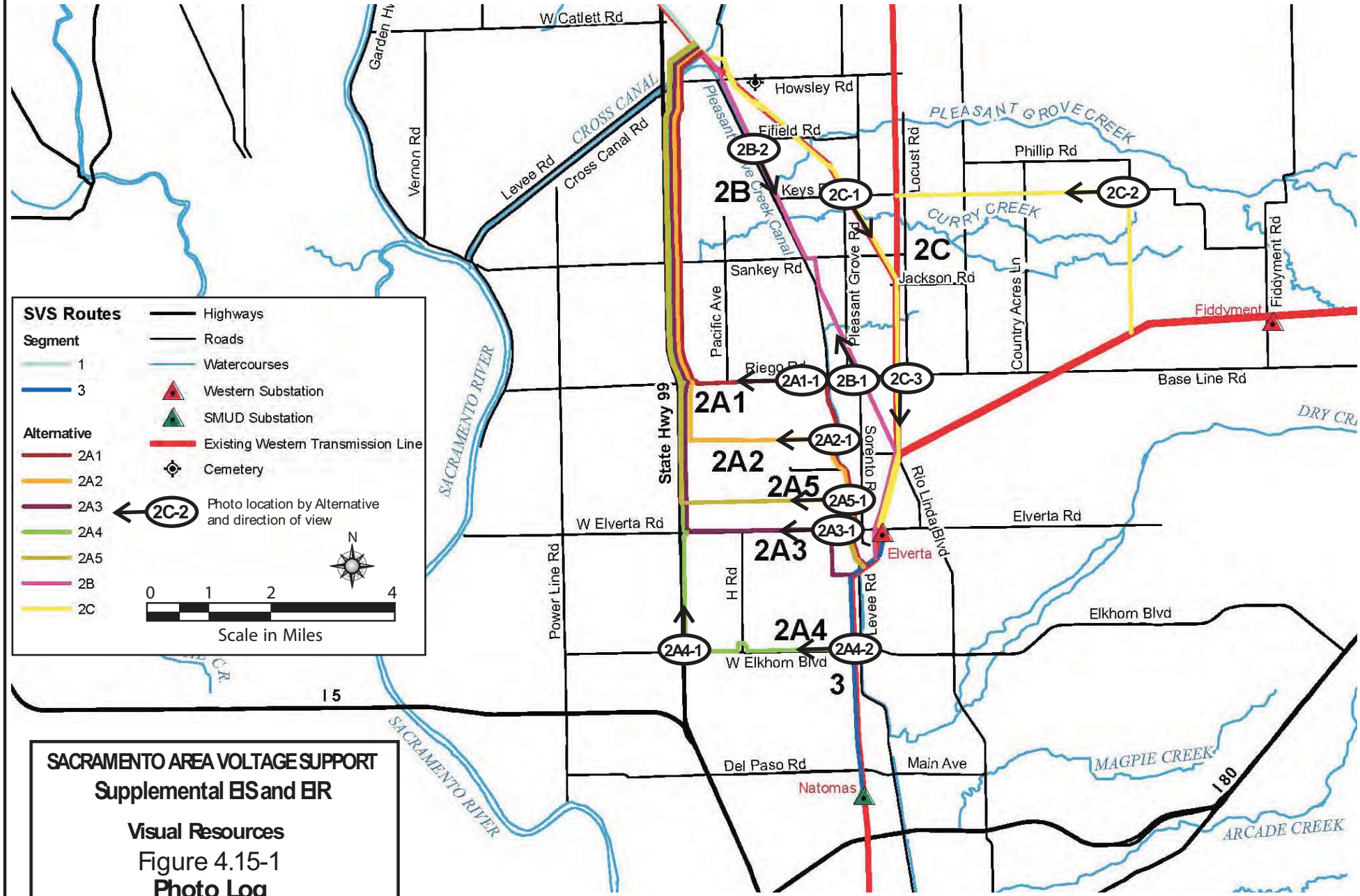
1:200,000

1 0.5 0 1 2 3

Miles

N





SACRAMENTO AREA VOLTAGE SUPPORT
Supplemental EIS and EIR

Visual Resources
Figure 4.15-1
Photo Log

Photo 2A1-1 (Alternative A1): intersection of Riego Road and Natomas Boulevard, facing west

Photo 2A2-1 (Alternative A2): Natomas Boulevard, facing west

Photo 2A3-1 (Alternative A3): intersection of W. Elverta Road and Natomas Boulevard, facing west

SACRAMENTO AREA VOLTAGE SUPPORT
Supplemental EIS and EIR
Visual Resources
Figure 4.15-2
Photographs Along Alternatives A1, A2 and A3

Photo 2A4-1 (Alternative A4): intersection of Highway 99 and W. Elkhorn Boulevard, facing north

Photo 2A4-2 (Alternative A4): intersection of W. Elkhorn Boulevard and Natomas Boulevard, facing west

Photo 2A5-1 (Alternative A5): Natomas Boulevard, facing west

SACRAMENTO AREA VOLTAGE SUPPORT
Supplemental EIS and EIR
Visual Resources
Figure 4.15-3
Photographs Along Alternatives A4 and A5

Photo 2B-1 (Alternative B): 7 - intersection of Pleasant Grove Road and Riego Road, facing northwest

Photo 2B-2 (Alternative B): intersection of Fi eld Road and Natomas Boulevard, facing south

SACRAMENTO AREA VOLTAGE SUPPORT
Supplemental EIS and EIR
Visual Resources

Figure 4.15-4
Photographs Along Alternative B

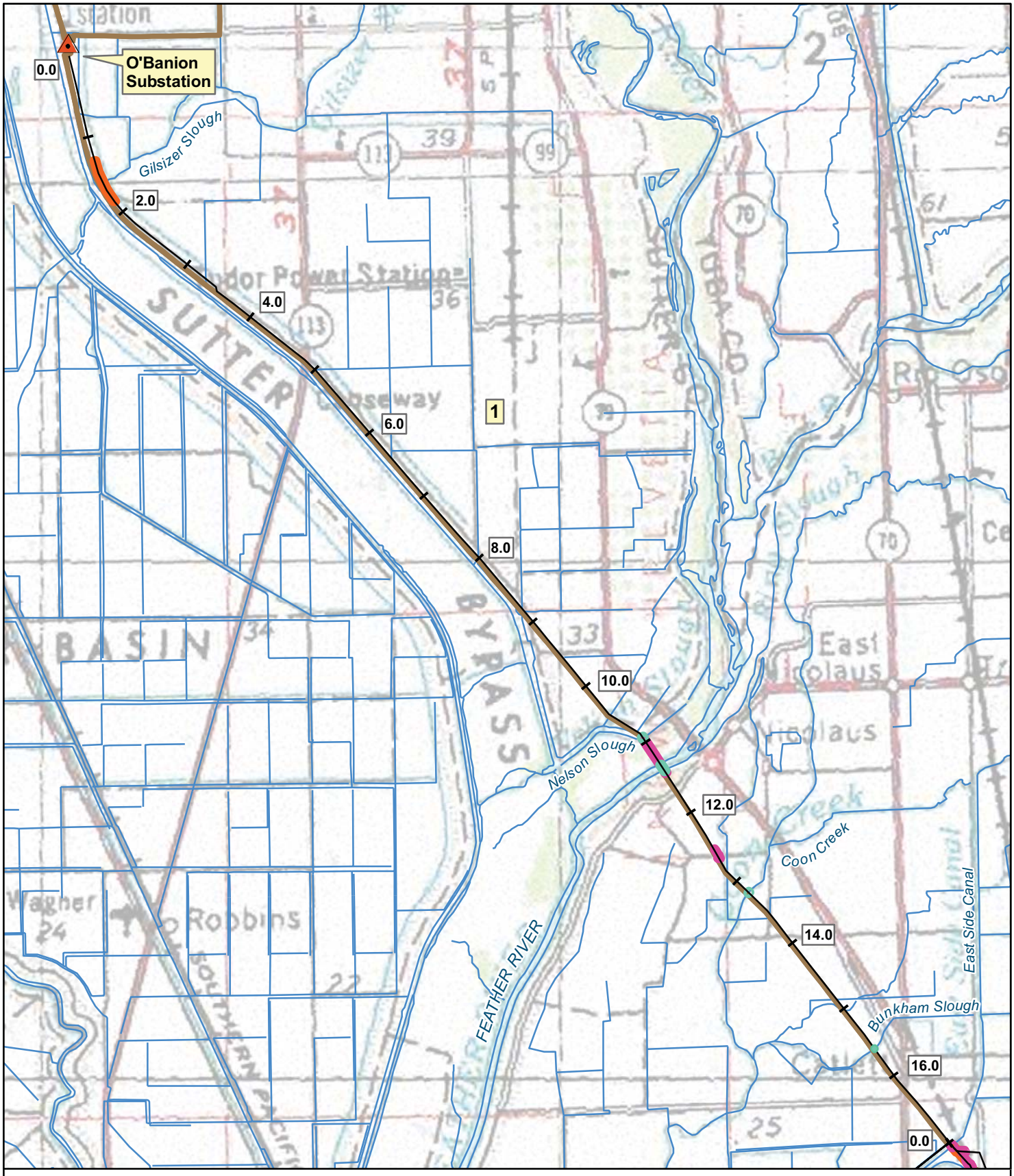
Photo 2C-1 (Alternative C): intersection of Keys Road and Pleasant Grove Road, facing southeast

Photo 2C-2 (Alternative C): Phillip Road, facing west

Photo 2C-3 (Alternative C): intersection of Riego Road and Locust Road, facing south

SACRAMENTO AREA VOLTAGE SUPPORT
Supplemental EIS and EIR
Visual Resources

Figure 4.15-5
Photographs Along Alternative C



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Source: SNR, GDT, California Spatial Information Library

- Riparian
- Freshwater Marsh
- Seasonal Wetland
- Waters
- Watercourse
- Proposed SVS Alignment
- Existing Transmission Line

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 4.17-1

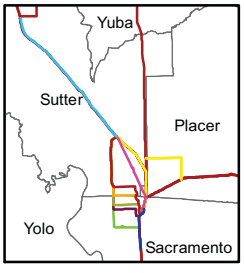
Wetlands/Riparian Crossings Along Segment 1

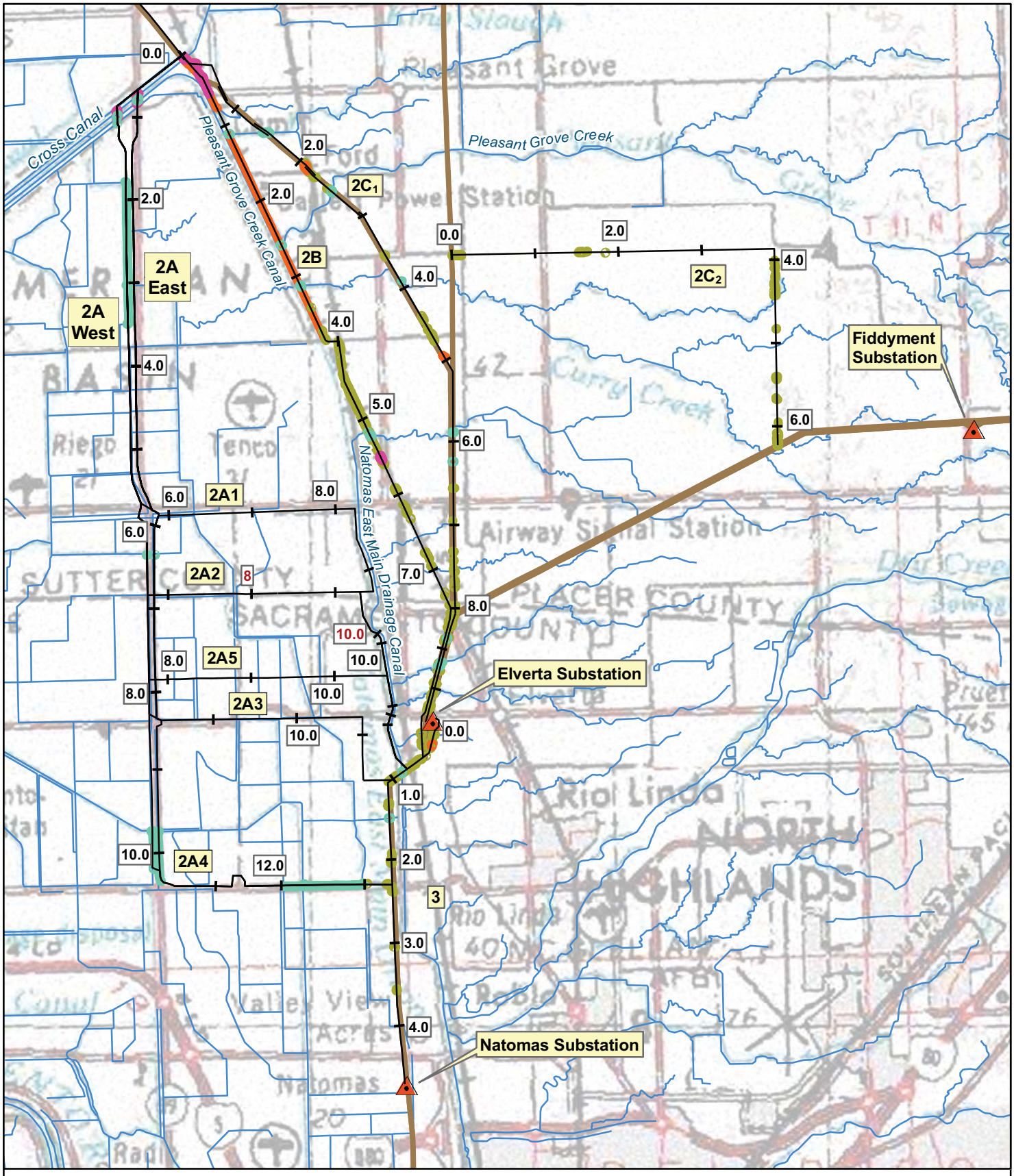
1:100,000

0.50.25 0 0.5 1

Miles

N





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Source: SNR, GDT, California Spatial Information Library

- Riparian
- Freshwater Marsh
- Seasonal Wetland
- Waters
- Watercourse
- Proposed SVS Alignment
- Existing Transmission Line

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure 4.17-2

Wetlands/Riparian Crossings Along Segments 2A1, 2A2, 2A3, 2A4, 2A5,2B, 2C$_1$, 2C$_2$, and 3

1:100,000

0.50.25 0 0.5 1

Miles

N