B. MODIFICATIONS TO THE PROJECT

As part of the final engineering of the approved Project, SCE has determined that certain modifications to the preliminary design of the 115 kV subtransmission line element are needed, which differ from what was analyzed in the previously approved EIR (CPUC Decision 08-12-031, SCH #2007071076). To better manage and track construction resources, public notifications, and environmental reviews, the subtransmission line element of the Project was divided into eight segments of varying lengths, referred to as Segments 1 through 8, as shown in Figure B-1 (at the end of this section). The proposed modifications described in this document are confined to Segments 2 and 4 of the 115 kV subtransmission line (Figure B-2(a-i) located at the end of this section) and are presented in detail below.

B.1 115 KV SUBTRANSMISSION LINE MODIFICATIONS

B.1.1 Structures and Associated Equipment

As described in the Draft EIR, the original design of the 115 kV subtransmission line included the installation of approximately 225 new steel poles, ranging from 65 to 85 feet tall. Approximately 25 percent of these steel poles would be bolted-base tubular steel poles (TSP), and the remaining 75 percent would be direct-buried lightweight steel (LWS) poles. The existing wood H-frame, three-pole, and single-pole structures would be removed and the new steel poles would primarily be installed at the same locations as the existing structures. As part of final engineering, SCE determined that additional poles would be required along Segments 2 and 4 of the 115 kV subtransmission line alignment. This determination was made based on a topographical/profile survey, detailed rights check, individual structure strength ratings, conductor sizes, span lengths, number of conductors/cables to be attached, and wind loading. Conductor sag calculations were used to determine the proper final pole heights along the line route. In designing the 115 kV subtransmission line, SCE attempted to determine the optimal combination of LWS poles and TSPs; where possible, LWS poles were the preferred choice, as they are less costly to purchase and construct (SCE, 2011a). However, in certain areas the terrain mandated the use of TSPs, such as at highway, waterway, and canyon crossings to accommodate longer spans and higher conductor tensions. All of these factors were considered in determining the final design for Segments 2 and 4.

In November 2009, SCE submitted to the CPUC a revised project description for the 115 kV subtransmission line element of the Project (SCE, 2009b). This document indicated that, based on preliminary design efforts, the subtransmission line element would require the installation of approximately 275 to 300 new steel poles, ranging from 70 to 100 feet tall. Since then, SCE has worked to refine its design and submitted a *Petition for Modification of Decision No. 08-12-031* on August 29, 2011 (SCE, 2011a). The revised design includes a total of 248 steel poles (versus 225 under the previously approved conceptual design). As noted above, the change primarily affects two segments of the line – Segments 2 and 4. Segment 2 begins just west of South Highland Home Road (milepost 10.1) and continues east to a point just west of South San Gorgonio Avenue/Highway 243 (milepost 12.95) (approximately 2.85 miles). Segment 4 begins just east of Bolo Court/Westward Avenue (milepost 6.15) and continues east to just west of Highland Springs Avenue (milepost 8.9) (approximately 2.75 miles).

The number of new structures in Segment 2 would be 61 replacing 29 existing H-frame, one existing three-pole, and three existing single-pole wood structures. This represents an increase of 28 structures from the original 33 analyzed in the EIR. Of these 61 structures, 49 would be LWS poles (80%) and 12 would be TSPs (20%) (SCE, 2011a). As shown in Figure B-3 (located at the end of this section), the LWS poles would range in height from 75 to 105 feet and the TSPs would range in height from 75 to 120 feet (SCE, 2011b).

Within Segment 4, a total of 57 new structures would be installed to replace 25 existing H-frame, two existing three pole, and three existing single-pole wood structures. This represents an increase of 27 structures from the original 30 analyzed in the EIR. Of these 57 structures, 48 would be LWS poles (84%) and 9 would be TSPs (16%). As shown in Figure B-3 (located at the end of this section), the LWS poles and TSPs would both range in height from 75 to 85 feet (SCE, 2011c). These changes in the number of structures within Segments 2 and 4, which generally results from an increase in the number of LWS poles within these portions of the 115 kV alignment (TSPs would continue to be utilized at turns/angles, at drainage crossings, and at some road crossings as per the original design), represent basically a doubling in the number of structures from what was originally analyzed in the EIR and approved by the CPUC. Additionally, the structure heights within Segments 2 and 4 have increased substantially from the original design (65 to 85 feet tall) and would instead range from 75 to 120 feet.

B.1.2 Steel Pole Site Preparation

Per the Draft EIR, many of the steel poles that are replacing existing wood pole structures in existing ROW areas would be installed at primarily the same locations (i.e., within approximately 10 feet of the existing structures) (SCE, 2007). However, due to the increase in both the quantity and size of conductors, windloading design criteria has resulted in some portions of this rebuild work requiring new pole locations to be interset between the existing locations. This is the situation along Segment 2 (between milepost 10.1 to 12.95) and Segment 4 (between milepost 6.15 to 8.9) of the 115 kV subtransmission line alignment. Since the route follows an existing access road, no new access or stub roads would be required at the new interset pole locations. The only ground surface disturbance required at a large majority of locations associated with this 115 kV subtransmission line work would be the result of the excavation required for the installation of the steel poles.

A very limited number of TSP locations are adjacent to areas where the assembly and erection of the new TSPs may require that a crane pad be prepared to allow an erection crane to set up 60 feet from the centerline of the TSP. In these cases, the size of the crane pad would be as small as possible, but in no case would it need to exceed approximately 50 feet by 50 feet (approximately 0.06 acre) and would be located adjacent to each applicable TSP location.

B.1.3 Staging and Access

No substantial modifications have been proposed to the Project's description of staging and access. The text provided below has been reproduced for reference.

Primary material staging areas would be established at El Casco Substation, as well as at Maraschino and Banning Substations, due to their proximity to certain portions of the work. Materials and equipment to be staged in these yards would include: steel poles, wire reels, insulators and hardware, heavy equipment, light trucks, construction trailers, and portable sanitation facilities. All material for the 115 kV subtransmission line work would be delivered by truck. Construction traffic would primarily use San Timoteo Canyon Road near El Casco Substation, California Avenue near Maraschino Substation, and San Gorgonio Avenue near Banning Substation, and would be scheduled for off-peak traffic hours to the extent possible.

B.1.4 Steel Pole Installation

No substantial modifications have been proposed to the Project's description of steel pole installation. The text below has been reproduced for reference.

LWS poles would be installed in holes bored approximately 24 to 30 inches in diameter and approximately 10 to 12 feet deep (SCE, 2007). LWS poles are normally installed using a line truck equipped with an auger. Once the LWS poles are set in place, bore spoils (material from the bored holes) would be used to backfill the hole. If the bore spoils are not suitable for backfill, imported material, such as clean fill dirt and/or pea gravel, would be used. Excess bore spoils would be distributed at each pole site and used as backfill for the holes left after removal of the nearby wooden poles.

TSPs are installed on top of cylindrical concrete footings approximately 6 feet in diameter and approximately 20 to 25 feet deep (SCE, 2007). After holes for the footings are bored, a steel (rebar) cage would be inserted into the hole, and then concrete would be poured into the hole to a level 1 to 2 feet above the natural surface. After the concrete has cured, the TSP would be bolted onto the footing. Excess bore spoils would be distributed at each pole site and used as backfill for the holes left after removal of the nearby wooden poles.

Both LWS poles and TSPs consist of separate base and top sections for ease of construction. Steel pole installation would begin with initially laying the individual sections on the ground at each location. While on the ground, the top sections would be pre-configured with the necessary insulators and wire stringing hardware. The installation is completed by using a line truck (for LWS poles) or a crane (for TSPs) to position each pole base section in the previously augured holes or on top of the previously prepared foundations. When the base section is secured, the top section is then placed onto the base section. The two sections may be spot welded together for additional stability.

B.1.5 Removal of Existing Wood Poles

No substantial modifications have been proposed to the removal of existing wood poles. The text below has been reproduced for reference.

Following installation of the new steel poles and the transfer of the old conductors to the new poles, the existing wood poles would be completely removed (including the portion below ground surface) and the hole would be backfilled using imported fill in combination with any native spoils that may be available as a result of excavation for the installation of the new steel poles. Because the existing wood H-frame poles that are being replaced are direct-buried, there are no footings to remove during removal of the wood poles. Depending on their condition and chemical treatment method, the wood poles being replaced would be reused by SCE, returned to the manufacturer, disposed of in a Class I hazardous waste landfill, or disposed of in the lined portion of a Regional Water Quality Control Board (RWQCB)-certified municipal landfill.

B.1.6 Conductor Pulling

No modifications have been proposed to the Project's description of conductor pulling. The text below has been reproduced for reference.

Conductor pulling includes all activities associated with the installation of conductors onto the steel poles. This activity includes the installation of primary conductor and ground wire, vibration dampeners, weights, and suspension and dead-end hardware assemblies.

A standard wire stringing plan includes a sequenced program of events starting with determination of the most effective wire pulls and wire pull equipment set-up positions. Depending on the concerns of various stakeholders along the line route, the stringing plan may require altered hours of operation, implementation of special dust control measures, or use of guard structures in particular areas to prevent inadvertent stoppages of traveled roadways.

Typically, wire pulls and splices occur every 6,000 feet. Wire pulls are the length of any given continuous wire installation process between two selected points along the line. Wire pulls are selected, where possible, based on availability of dead end structures at the ends of each pull, geometry of the line as affected by points of inflection, terrain, and suitability of stringing and splicing equipment set ups. The dimensions of the area needed for conductor pulling set ups can vary depending upon the terrain; however, a typical set up for single-circuit conductor pulling is approximately 100 feet by 200 feet. Where necessary due to space limitations, however, crews can work from within a somewhat smaller area.

Special equipment is positioned at each end of the conductor pull. At one end, a puller is positioned and on the other end a tensioner and wire reel stand truck is positioned. Once positioned, a lightweight sock line is installed through stringing sheaves on each steel pole for the particular set of spans selected for the conductor pull. The sock line is then used to pull in the conductor pulling cable. The conductor pulling cable is then attached to the conductor using a special swivel joint to prevent the wire from “basketing” and allowing it to rotate freely, thus preventing complications from twisting as the conductor unwinds off of the reel. Pulling, sagging, and clipping-in the conductors are then completed. Stringing equipment from one end of the pull is then rotated 180 degrees to face the new pull direction and the equipment from the other end of the pull is then "leapfrogged" to its new pulling position and the process is repeated. A similar process is employed for the ground wire. Conductor pulling would be in accordance with SCE specifications and similar to process methods detailed in IEEE Std. 524-1992 (Guide to the Installation of Overhead Transmission Line Conductors).

B.1.7 Construction Labor and Equipment

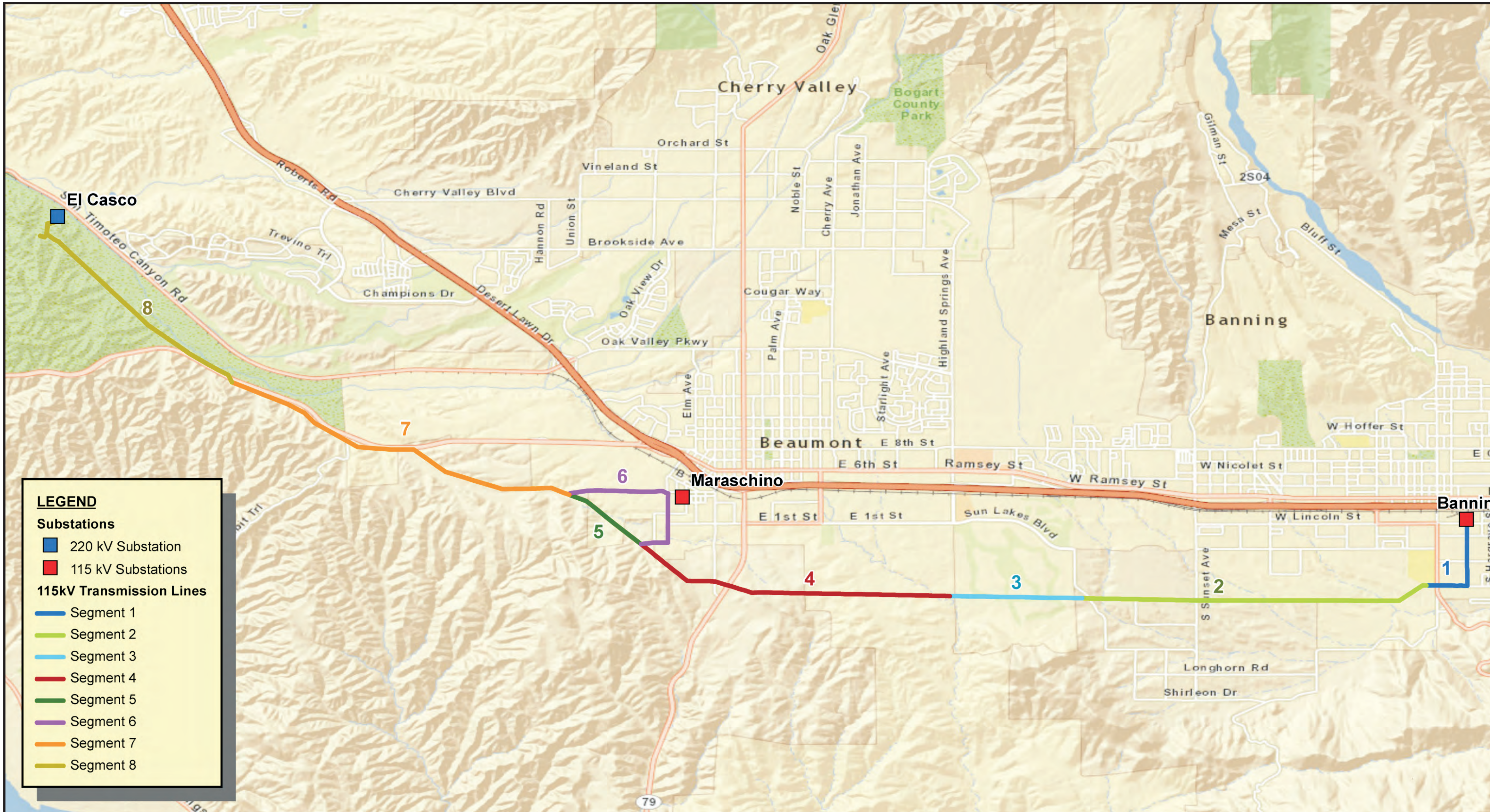
The anticipated construction personnel and equipment for the overall 115 kV subtransmission line element of the Project (Segments 1 through 8) are summarized in Table B-1, below. Changes to this table since the Draft EIR are denoted below, where deletions are shown in strike-out text and additions in underlined text. As shown in Table B-1, construction of the 115 kV subtransmission line work (Segments 1 through 8) would require approximately 525 business days to complete, an increase of 315 days from the original 210 days stated in the Draft EIR. It should be noted that the number of days are not necessarily consecutive or sequential, but reflect an overall effort throughout the course of the construction schedule. In addition to this increase in number of days to construct the 115 kV subtransmission line, the number of personnel has increased from 34 to 42, additional equipment requirements have been specified, and since there are no spur roads required this element has been removed. Activities associated with the construction of the 115 kV subtransmission line began in the fourth quarter of 2009 and are expected to continue through the first quarter of 2013 pending approval of the proposed modifications to the 115 kV subtransmission line described herein.

Table B-1 Construction Personnel and Equipment Summary (115 kV Subtransmission Lines)

Construction Element	Number of Personnel	Number of Days	Equipment Requirements	
Survey	4	~~5 (Ph. 1)~~ ~~20 (Ph. 2)~~ 25	2 – Picks-ups (Gasoline/Diesel)	
Receive and Load Out Materials	6	~~5 (Ph. 1)~~ ~~25 (Ph. 2)~~ 45	1 – 50-ton Hydro Crane (Diesel) 1 - 980 Loader (Diesel)	1 – 5-ton Forklift (Diesel) 1 – Pick-up (Diesel)
~~Spur Road Work~~	~~4~~	~~5 (Ph. 1)~~ ~~25 (Ph. 2)~~	~~1 – Motor Grader (Diesel)~~ ~~1 – Water Truck (Diesel)~~	~~1 – Pick-up (Diesel)~~
TSP Foundation Installation	8	125	1 – 30 ton Crane (Diesel) 1 – Water Truck (Diesel) 2 – Concrete Trucks (Diesel) 1 – Concrete Pumper (Diesel)	2 – Pick-ups (Gasoline/Diesel) 1 – Auger Truck (Diesel) 1 – Semi-trailer (Diesel)
Steel Pole Construction and Conductor Installation	~~16~~ 20	~~10 (Ph. 1)~~ ~~95 (Ph. 2)~~ 300	1 – 150-ton Hydro Crane (Diesel) 1 – Pickup (Gasoline/Diesel) 1 – Line Truck (Diesel) 1 – Wire Pulling Machine (Diesel) 1 – Wire Tension Machine (Gas) 2 – 30-ton Crane (Diesel) 2 – Truck Mounted Crane (Diesel)	1 – Water Truck (Diesel) 2 – 5-ton Trucks (Diesel) 1 – Semi-Tractor (Diesel)
Clean-up	4	~~5 (Ph. 1)~~ ~~15 (Ph. 2)~~ 30	1 – 10-ton Dump Truck (Diesel) 1 – Pick-up (Gasoline/Diesel)	

SCE, 2009b.

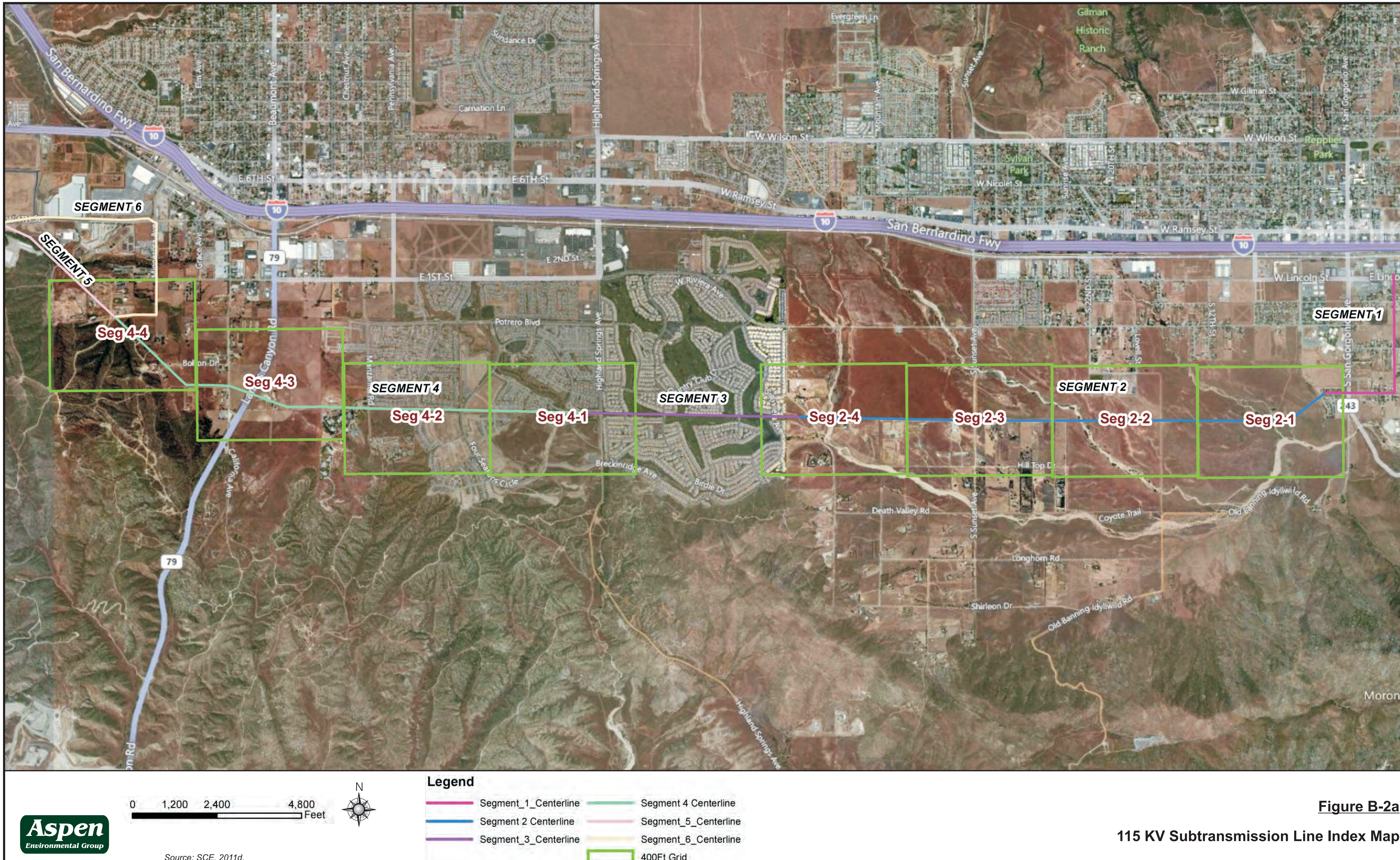
Intentionally Left Blank



Source: SCE, 2011d.

Figure B-1

115 KV Subtransmission Line Route Overview Map



Aspen Environmental Group

Source: SCE, 2011d.

Figure B-2a

115 KV Subtransmission Line Index Map

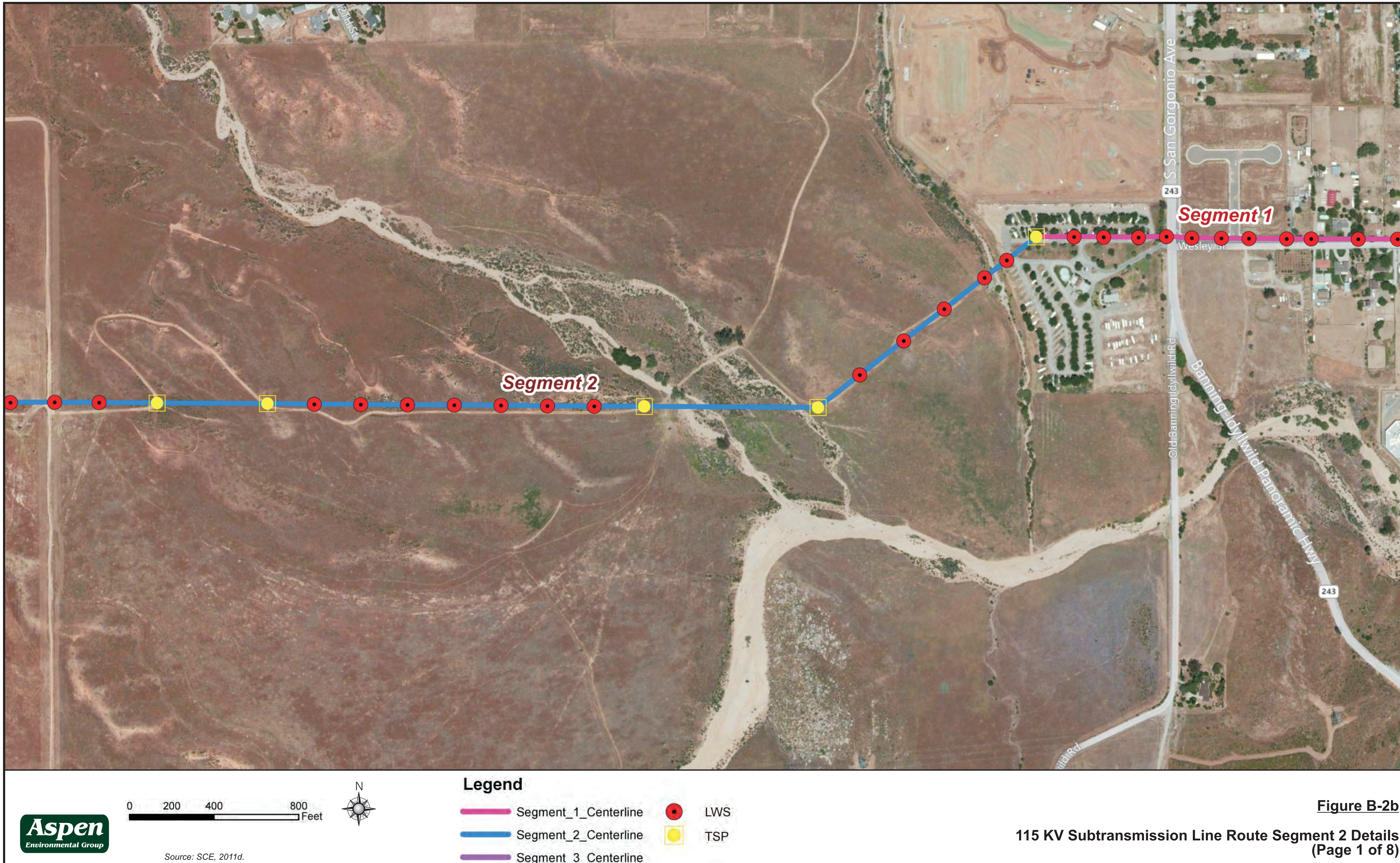


Figure B-2b

115 KV Subtransmission Line Route Segment 2 Details (Page 1 of 8)

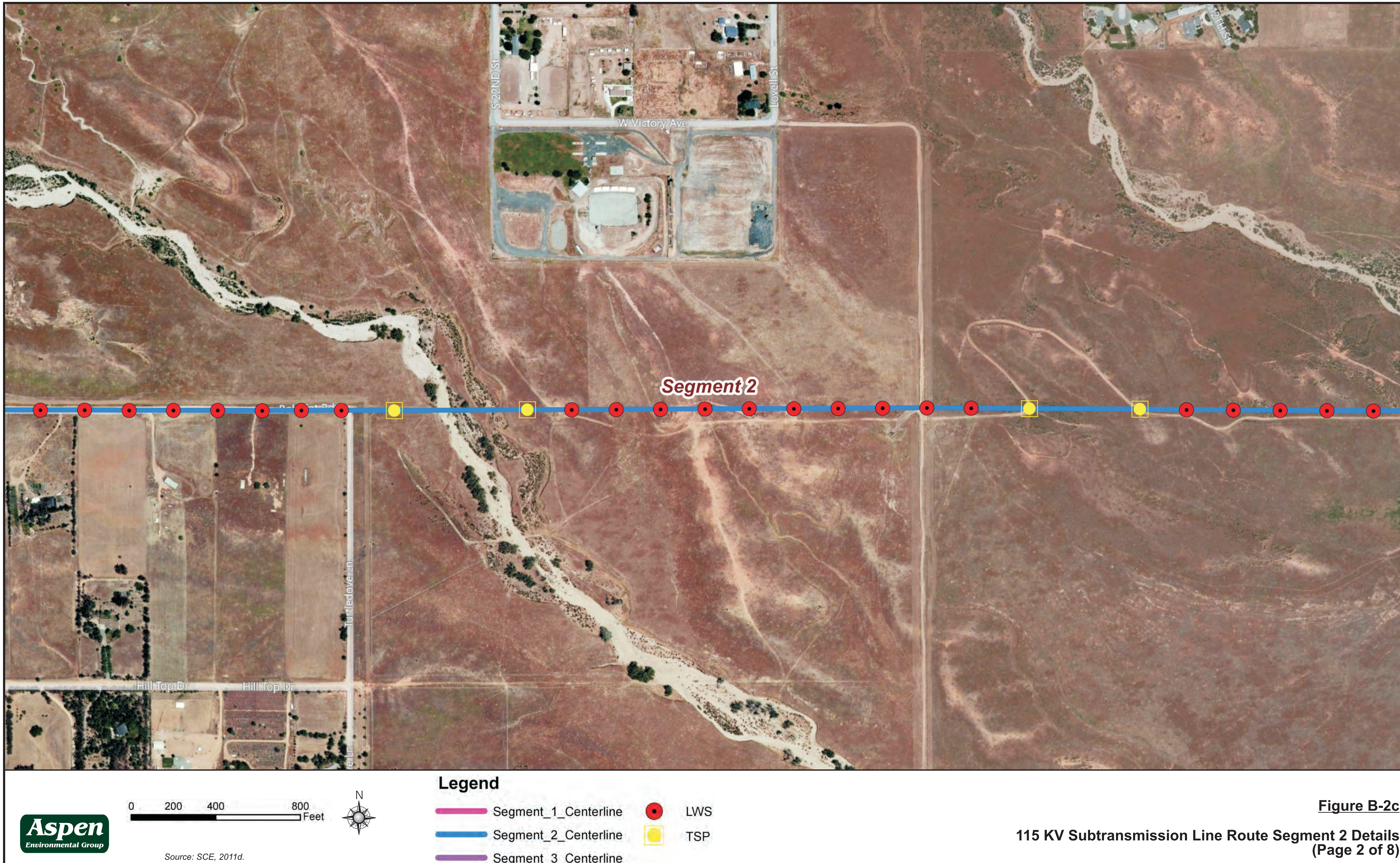


Figure B-2c

115 KV Subtransmission Line Route Segment 2 Details (Page 2 of 8)

Aspen Environmental Group

0 200 400 800 Feet

N

Source: SCE, 2011d.

Legend

- Segment_1_Centerline
- Segment_2_Centerline
- Segment_3_Centerline
- LWS
- TSP

Figure B-2d

115 KV Subtransmission Line Route Segment 2 Details (Page 3 of 8)

Legend

	Segment_1_Centerline		LWS
	Segment_2_Centerline		TSP
	Segment_3_Centerline		

0 200 400 800 Feet

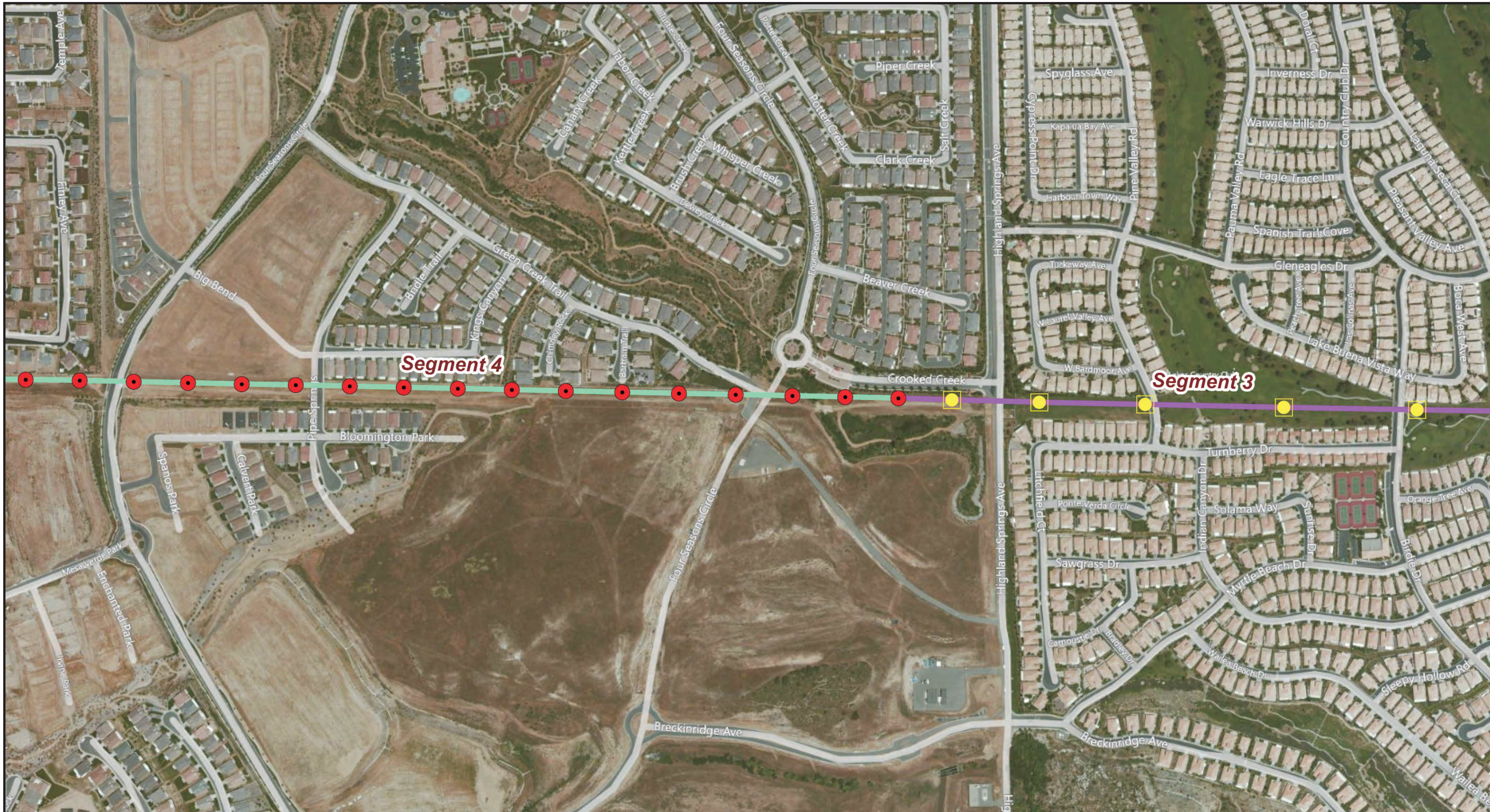
N

Aspen Environmental Group

Source: SCE, 2011d.

Figure B-2e

115 KV Subtransmission Line Route Segment 2 Details (Page 4 of 8)



Legend

- Segment_3_Centerline
- Segment_4_Centerline
- Segment_5_Centerline
- Segment_6_Centerline
- LWS
- TSP

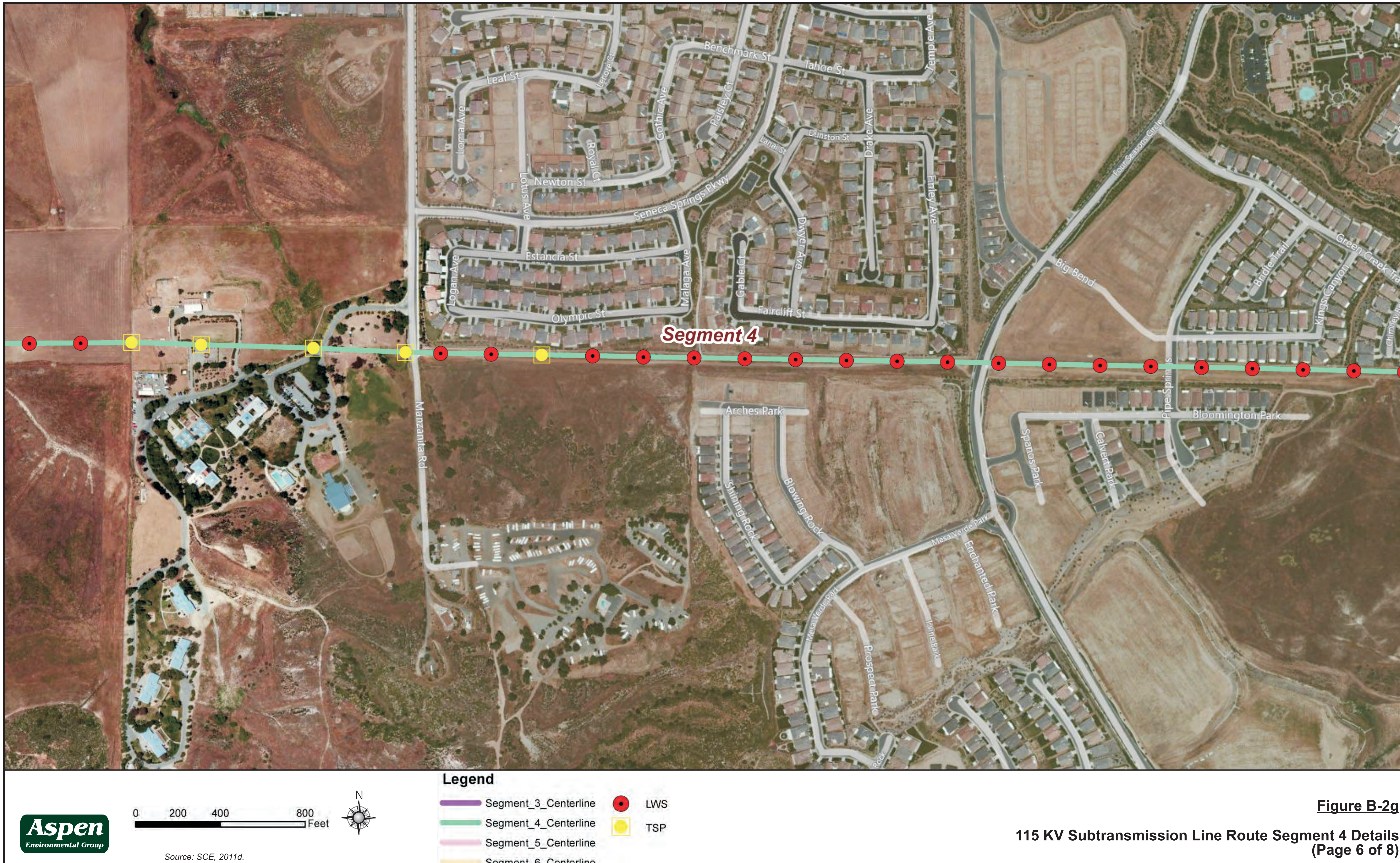
0 200 400 800 Feet

N

Source: SCE, 2011d.

Figure B-2f

115 KV Subtransmission Line Route Segment 4 Details (Page 5 of 8)



Source: SCE, 2011d.

Figure B-2g

115 KV Subtransmission Line Route Segment 4 Details (Page 6 of 8)

Figure B-2h

115 KV Subtransmission Line Route Segment 4 Details (Page 7 of 8)

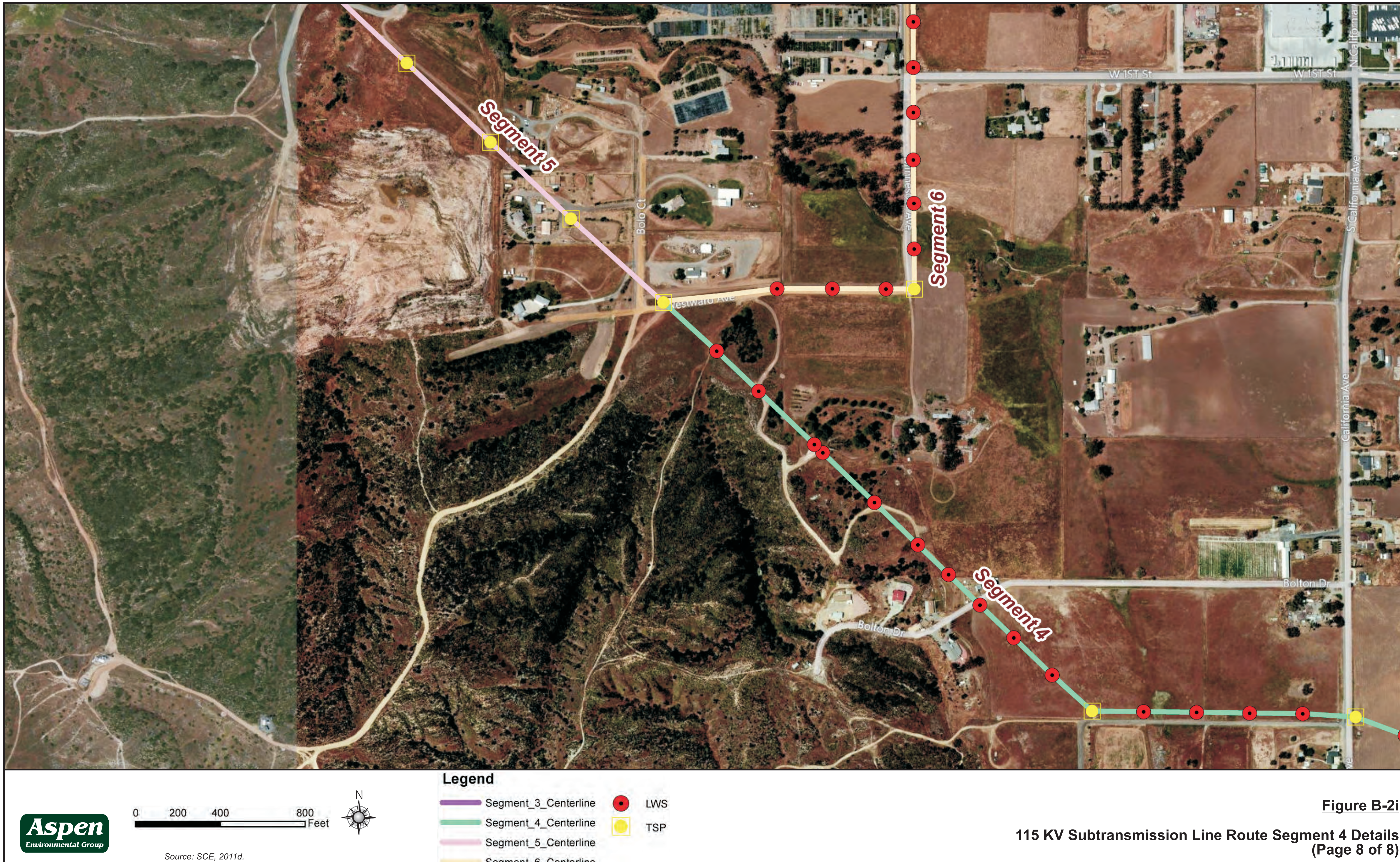
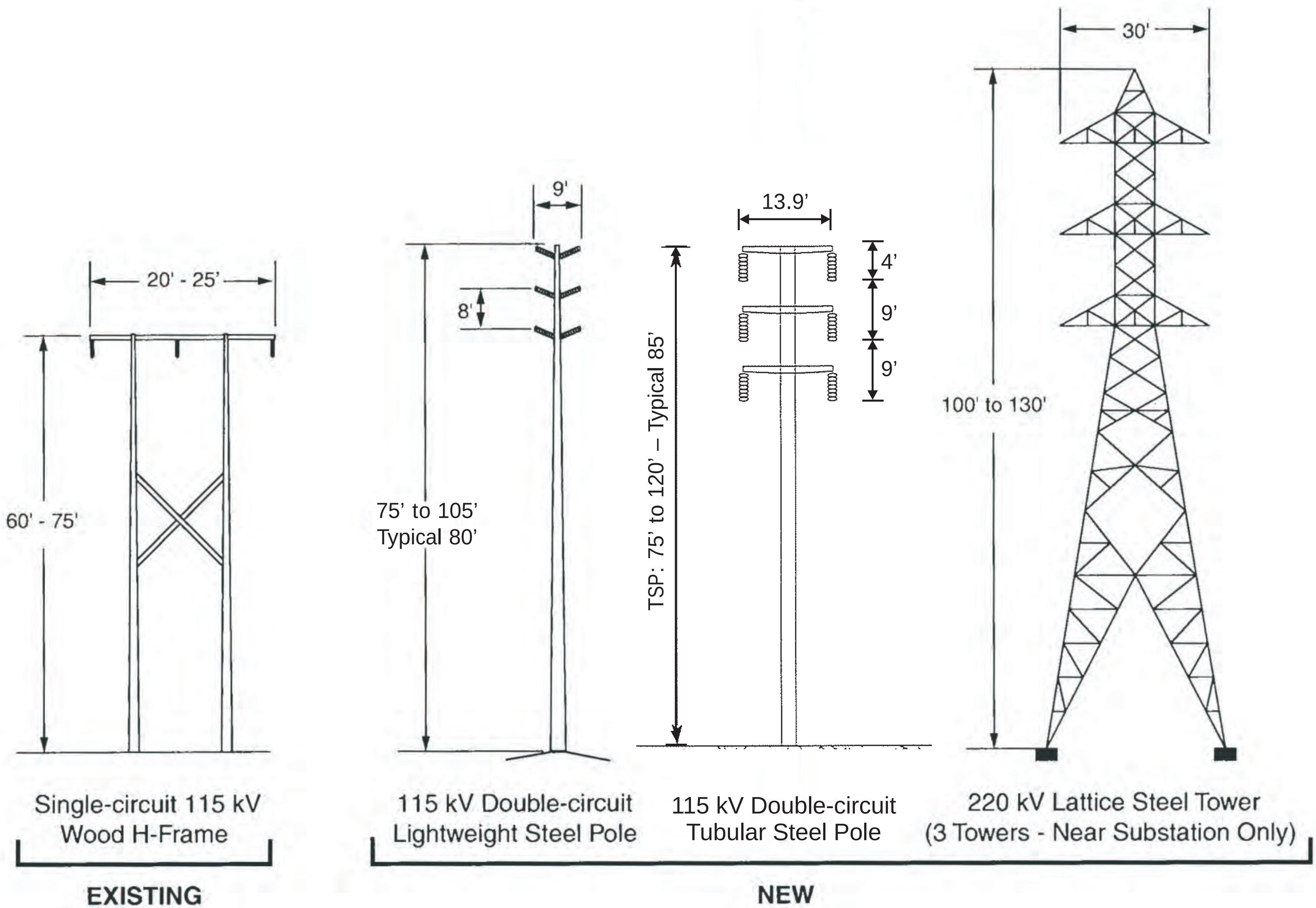


Figure B-2i

115 KV Subtransmission Line Route Segment 4 Details (Page 8 of 8)



Aspen Environmental Group

Source: SCE, 2011c.

Figure B-3

Typical Structure Designs Segments 2 and 4