Rebecca Giles
Regulatory Case Manager
San Diego Gas and Electric Company
8330 Century Park Court
San Diego, CA 92123-1530

February 27, 2014

Reg.12-10/A.12-10-009
SDG&E CNF PTC Application

Sent Via Electronic Mail

Lisa Orsaba California Public Utilities Commission Energy Division 505 Van Ness Avenue San Francisco, CA 94102	Rica Nitka Dudek 605 Third Street Encinitas, CA 92024

Subject: ED-SDG&E-05 SDG&E Partial Response

Dear Ms. Orsaba and Ms. Nitka:

San Diego Gas and Electric Company (SDG&E) hereby submits a response to Data Request No. 5, Alternatives 2 and 3, dated February 5, 2014 regarding the Cleveland National Forest MSUP/PTC. Note that SDG&E is responding to the specific questions posed in the data request. As discussed at the recent supplemental scoping meeting, SDG&E is continuing to explore other potential alternatives for TL 626 and SDG&E plans to submit a comment letter by the March 7th deadline addressing those.

The response to Alternative 1 will be submitted in a supplemental data response by March 4th.

If you have any questions, please let me know.

Sincerely,

Signed

Rebecca Giles
Regulatory Case Manager

Enclosures

cc:
Allen Trial – SDG&E
Estela de Llanos – SDG&E
Tim Knowd – SDG&E
Central Files - SDG&E
John Porteous – Dudek
Bob Hawkins – US Forest Service
Debbie Hobbs – Cleveland National Forest, USFS
Fred Bauermeister – Insignia
Kelli Taylor - Cleveland National Forest, USFS

1.0 ALTERNATIVES

Based on public scoping for the Mater Special Use Permit/Permit to Construct Power Line Replacement Projects, additional information is requested regarding project alternatives.

Alternative 1: Undergrounding of TL 626 in Boulder Creek Road

This alternative would partially underground TL 626 within Boulder Creek Road within the vicinity of the identified FS study corridor for TL 626. Two options have been identified. Option 1 starts at the southernmost pole location (Z372116) and ties back into the overhead portion of TL 626 around pole (Z213680). Under option 1, a portion of C79 would need to be undergrounded. Option 2 starts at pole (Z372142) north of C79 and would tie back into the overhead portion of TL 626 around pole (Z213680). Please describe the project components and construction activities and methods required to underground TL 626 as described including the temporary and permanent footprint required, number of vaults and any other facilities required.

SDG&E Response to Alternative 1:

The response will be provided on March 4th.

Alternative 2: Relocate TL 626 along State Route 79

This alternative would remove a portion of TL 626 within the vicinity of the identified FS study corridor for TL 626 (around pole Z372116 to pole Z213680) and co-locate this segment of TL 626 with existing transmission facilities along SR79. Please describe the project components and construction activities and methods required to relocate TL 626 as described including any additional facilities required to meet the needs of existing energy users.

SDG&E Response to Alternative 2: Relocate TL 626 along State Route 79

SDG&E does not currently have any transmission or power line facilities along State Route (SR-) 79; however, portions of one distribution circuit, C79, are located along this roadway for a portion of its length between Interstate (I-) 8 and SR-78. In order to collocate a segment of TL626 along SR-79, the existing C79 poles would need to be removed and replaced with steel poles similar in size and type as those described for the Proposed Projects in the Revised Plan of Development (POD).

As shown in Figure 1: Proposed Alternative 2 Alignment, the existing alignment for TL626 is located in the vicinity of Boulder Creek Road to the west of Cuyamaca Peak, Cuyamaca State Park, and the Cleveland National Forest’s (CNF’s) Sill Hill Inventoried Roadless Area (IRA); SR-79, however, is located to the east of these areas approximately 3.8 miles east of the existing TL626 alignment. The southern boundary of Cuyamaca State Park extends south of the southernmost pole identified for this alternative, Z372116, by approximately 1.8 miles. Similarly, the northern boundary of Cuyamaca State Park is located approximately 0.9 mile south of the northernmost pole identified for this alternative, Z213680. In order to realign the requested segment from its existing alignment to a location along SR-79, SDG&E would need to construct approximately 4.7 miles of new steel poles within the Sill Hill IRA, Cuyamaca State Park, and private lands to reach SR-79 to the east. Once along SR-79, SDG&E would construct approximately 4.1 miles of new steel poles on private lands along SR-79. In order to reconnect the new alignment with the existing alignment at pole Z213680, SDG&E would then construct approximately 5.4 miles of new steel poles on private lands. Because detailed engineering on this alternative has not been completed, SDG&E estimated the approximate number of poles that would be required for this alternative based on the average number of poles per mile along the existing TL626 alignment; actual pole numbers may vary significantly according to local topographical, environmental, and engineering requirements. Table 1: Approximate Pole Requirements for Alternative 2 displays the estimated number of poles that would be required to be constructed in the Sill Hill IRA, Cuyamaca State Park, and on private lands in order to relocate this segment of TL626 to along SR-79. In addition, approximately three existing poles north of pole Z372116 would be required to be reconstructed to serve existing customers along the existing alignment, and approximately 23 existing poles south of pole Z213680 would be required to be reconstructed to serve existing customers along the existing alignment.

With the inclusion of this alternative alignment, TL626 would total more than 30 miles in length between Descanso and Santa Ysabel substations. The installation and operation of a 69 kV power line of this length is not optimal due to voltage drop and other operational concerns.

In addition to the new alignment, SDG&E estimates that approximately 6.5 miles of new access roads on private lands would need to be established for construction, operation, and maintenance of the new alignment segment. All poles located within the Sill Hill IRA would be constructed and maintained using helicopter access. Construction activities and methods used for this alternative would be the same as those described in the Revised POD.

Table 1: Approximate Pole Requirements for Alternative 2

Property	Approximate Number of Miles Crossed	Approximate Number of Poles in Alternative Segment*
Sill Hill IRA	1.6	24
Cuyamaca State Park	2.7	41
Private Lands	9.9	149
Total	**14.2**	**214**

*Based on an average of 15 poles per mile

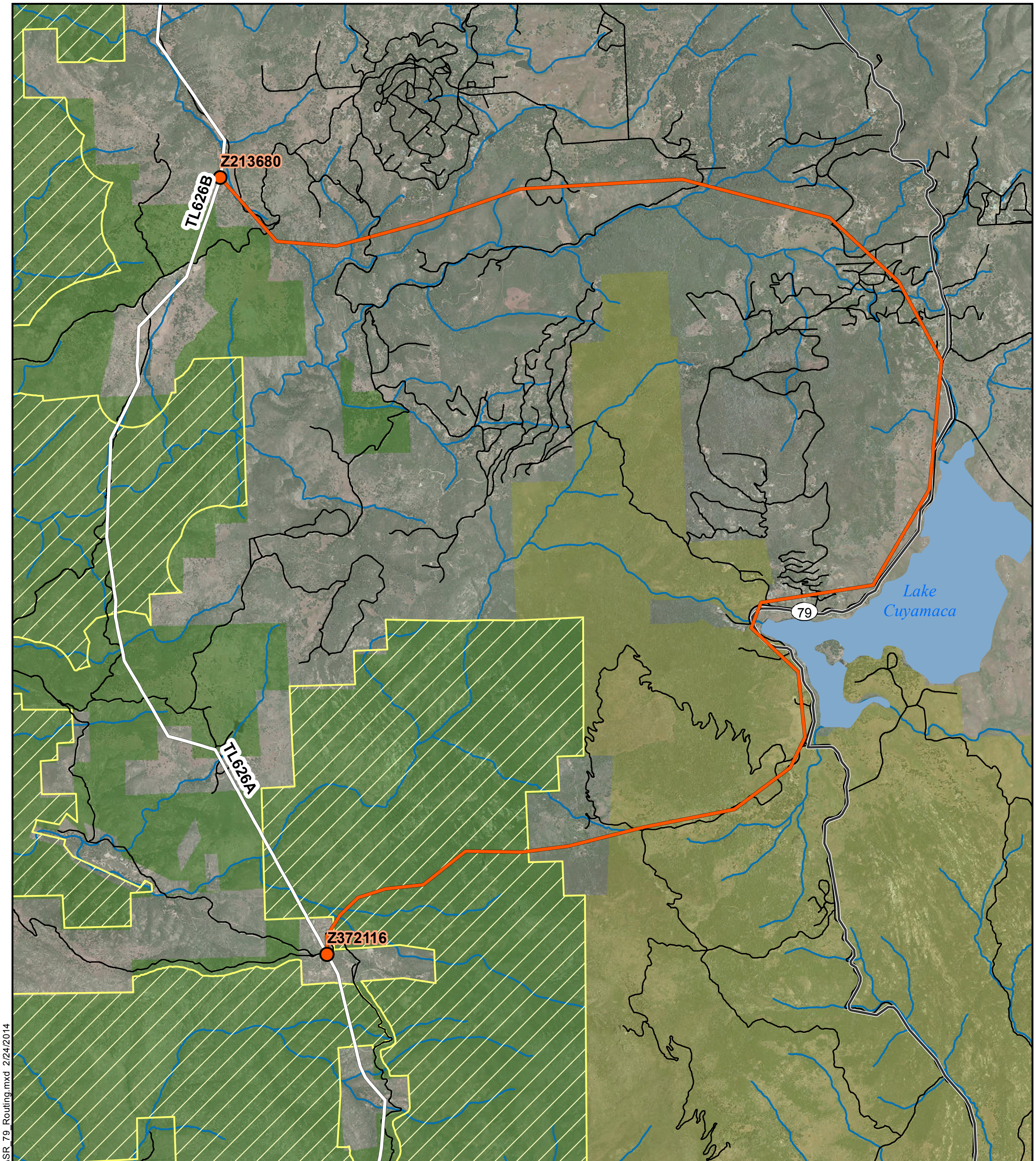

Figure 1: Proposed Alternative 2 Alignment

CNF Power Line Replacement Projects

Existing Pole
Existing Power Line
Proposed TL626 Alternative
Inventoried Roadless Area
Cleveland National Forest
Cuyamaca State Park
Roads
Hydrological Feature
Lake

1 inch = 1 miles
0 1 2 Miles

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Alternative 3: Consolidate TL 6923 and TL 625

This alternative would co-locate portions of TL 6923 and TL 625 on existing towers used for the Sunrise Powerlink project. Please confirm whether such underbuilding has been taken into account in the Sunrise towers design.

SDG&E Response to Alternative 3: Consolidate TL 6923 and TL

The Sunrise towers are not designed to accommodate the addition of 69kV lines. The existing towers do not have the necessary height or the strength for such a modification.

Rebecca Giles
Regulatory Case Manager
San Diego Gas and Electric Company
8330 Century Park Court
San Diego, CA 92123-1530

March 4, 2014

Reg.12-10/A.12-10-009
SDG&E CNF PTC Application

Sent Via Electronic Mail

Lisa Orsaba California Public Utilities Commission Energy Division 505 Van Ness Avenue San Francisco, CA 94102	Rica Nitka Dudek 605 Third Street Encinitas, CA 92024

Subject: ED-SDG&E-05 SDG&E Partial Response - Alternative 1

Dear Ms. Orsaba and Ms. Nitka:

San Diego Gas and Electric Company (SDG&E) hereby submits a partial response to Data Request No. 5, dated February 5, 2014 regarding the Cleveland National Forest MSUP/PTC. This submittal provides a response to Alternative 1 and completes the utility's response to this request.

If you have any questions, please let me know.

Sincerely,

Signed

Rebecca Giles
Regulatory Case Manager

Enclosures

cc: Allen Trial – SDG&E
Estela de Llanos – SDG&E
Tim Knowd – SDG&E
Central Files - SDG&E
John Porteous – Dudek
Bob Hawkins – US Forest Service
Debbie Hobbs – Cleveland National Forest, USFS
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Kelli Taylor - Cleveland National Forest, USFS

1.0 ALTERNATIVES

Based on public scoping for the Mater Special Use Permit/Permit to Construct Power Line Replacement Projects, additional information is requested regarding project alternatives.

Alternative -1 Undergrounding of TL 626 in Boulder Creek Road

This alternative would partially underground TL 626 within Boulder Creek Road within the vicinity of the identified FS study corridor for TL 626. Two options have been identified. Option 1 starts at the southernmost pole location (Z372116) and ties back into the overhead portion of TL 626 around pole (Z213680). Under option 1, a portion of C79 would need to be undergrounded. Option 2 starts at pole (Z372142) north of C79 and would tie back into the overhead portion of TL 626 around pole (Z213680). Please describe the project components and construction activities and methods required to underground TL 626 as described including the temporary and permanent footprint required, number of vaults and any other facilities required.

SDG&E Response to Alternative-1:

Undergrounding TL626 along Boulder Creek Road for the portion of the existing alignment between pole Z273116 and Z213680 (Option 1) or between pole Z372142 and Z213680 (Option 2) would require similar project components and construction activities/methods as described in the following sections.

Project Components

Both Option 1 and Option 2 would require some combination of overhead and underground arrangement to connect either option with the existing alignment. Conductors and other equipment required for the overhead portion would be consistent with that described in Section 4.1.1 Conductor Installation of the Revised POD. Additionally, underground conduits would be installed in approximately 2.5-foot-wide, 3-foot-deep concrete duct packages placed within Boulder Creek Road. The burial depth of the package would vary depending on field conditions, but would typically have a minimum of 3 feet of cover. Underground concrete splice vaults measuring approximately 21 feet long, 9 feet wide, and 10 to 12 feet deep would be installed in-line with the concrete duct packages every approximately 1000 to 1500 feet to provide access to the underground cables for operation and maintenance activities. Riser poles would be installed where conductors transfer between overhead and underground arrangements.

Construction Activities and Methods

Several construction methods would be required to underground TL626 along Boulder Creek Road, including open trenching, jack-and-bore, and horizontal directional drilling (HDD), according to the unique topographical and surface features along the length of Boulder Creek Road. Various conditions present unique constraints to undergrounding power lines along Boulder Creek Road, including hydrological features, hairpin turns, and road slopes in excess of 12 percent. Jack-and-bore or HDD would be preferential where surface features, such as creek crossings or other hydrological features, are present. A minimum turning radius of approximately 25 feet would be required when installing underground duct packages and cables at road turns. Where road slopes exceed 12 percent, SDG&E would be required to reduce the angle of slope to avoid stresses in the joints and conductor terminations during construction and operation and maintenance.

<u>Open Trenching</u>

Where local topography and surface conditions warrant, SDG&E would utilize open trenching to install underground duck packages for TL626 along Boulder Creek Road. Prior to trenching for underground power lines, SDG&E would notify other utility companies (via Underground Service Alert) to locate and mark existing underground utilities along the proposed underground alignment. Exploratory excavations (potholing) would also be conducted to verify the locations of existing facilities in the field, if necessary.

Trenches would be excavated using a backhoe, saw cutter, and other trenching equipment as warranted by site conditions. The depth of the trench would be determined by localized topography and potential conflicts, but is anticipated to be approximately 6 to 10 feet deep, with a width of approximately 2.5 feet. Dewatering of the trenches is not anticipated, but may be required based on weather conditions during construction. If trench water is encountered, trenches would be dewatered using a portable pump and disposed of in accordance with applicable regulations and permits. Once installed, the depth from grade to the top of the concrete duct package would be at least 3 feet. The trench alignment would proceed to a riser pole at either end of the undergrounded segment and support the transition from the underground to overhead conductors.

The underground power lines would be installed in a duct bank containing between four and nine 4- to 6-inch-diameter polyvinyl chloride (PVC) conduits encased in concrete with a cover of slurry or engineered or native backfill. In order to facilitate the pulling and splicing of the cables, underground concrete splice vaults measuring approximately 21 feet long, 9 feet wide, and 10 to 12 feet deep would be installed in-line with the underground duct banks every approximately 1000 to 1500 feet depending on terrain, or at shorter intervals where horizontal road bends or slopes in excess of 12 percent grade are encountered. These vaults would also provide access to the 69 kV underground conduits for maintenance, inspection, and repair during operation. Each vault would include an approximately 5.5-foot by 6.5-foot access cover to allow for personnel and equipment entry during maintenance activities, resulting in an approximately 35-square-foot permanent impact.

The pre-formed, steel-reinforced, precast concrete splice vaults would be transported to the associated work areas on flatbed trucks and lowered into place using small, truck-mounted cranes. The splice vaults would then be connected to the underground duct banks before being covered with at least 3 feet of engineered or native fill. The trench alignment would proceed to the riser pole and support the transition between the underground and the overhead conductors. After installation of the concrete duct bank, excavated trench material or engineered backfill would be used to backfill the trench. The remainder of the excavated material would be spread across the right-of-way or access roads, if possible, or disposed of at an approved facility.

After trenching activities for the underground duct banks have been completed, the PVC cable conduits would be installed (and separated by spacers), and concrete would be poured around the conduits to form the duct banks. Upon completion of the duct bank, the trenches would be backfilled with native materials or engineered backfill. The 69 kV cables would then be installed in the newly constructed duct bank. Each cable segment would be pulled into the duct bank and terminated at the riser pole where the line converts to an overhead configuration. To pull the cable through the ducts, a cable reel would be placed at one end of the section and a pulling rig at the other end. A larger rope would then be pulled into the duct using a fish line and attached to the cable puller, which pulls the cable through the duct. Lubricant would be applied to the cable as it enters the duct to decrease friction during pulling. After installation of the conductor, the ground surface would be restored to near pre-construction conditions and repaved or resurfaced as appropriate.

<u>Jack-and-Bore</u>

SDG&E would use jack-and-bore construction in areas where open trenching is not feasible due to the presence of surface waters, such as where TL626 crosses Boulder or Cedar creeks, or where other surface features exist that prohibit open trenching from being used. As described in Section 4.3 69 kV Power Line Undergrounding of the Revised POD, this technique consists of a boring operation that simultaneously pushes a casing under an obstacle and removes the spoil inside the casing with a rotating auger. Boring operations would begin with excavating bore pits at the sending and receiving ends of the bore. Boring and receiving pits would typically measure approximately 20 feet by 40 feet. The depth of the proposed bore pits would be between 10 and 20 feet, depending on local site conditions. After establishing the bore pits, boring equipment would be delivered to the site and then installed into the bore pit at the sending end. The casing would be installed at least three feet below the surface feature, as practicable. Once the casing is in place, Schedule 80 PVC cable ducts would be installed within the casing using spacers to hold them in place. The casing would then be injected with a high-strength grout or cement to remove all voids and provide additional rigidity. The casing would be left in place to protect the conduit once it has been installed. Following the completion of all boring, installation of the casing and conduits, and completion of the concrete duct bank, the bore pits would be backfilled using native or engineered material. Soil not used for backfill would be hauled off site and disposed of at an approved facility, such as the Allied Otay Landfill.

Horizontal Directional Drill

Where open trenching or jack-and-bore techniques are infeasible due to local topography or environmental or engineering constraints, the use of horizontal directional drill (HDD) methods may be required. HDD is generally conducted in two phases: in the first phase, a small pilot hole is directionally drilled along a designed path; the second phased includes enlarging this pilot hole to a diameter large enough to accommodate the underground pipe, then pulling the pipe back through the enlarged hole. Construction methods can vary among contractors, and the selected contractor typically provides its proposed construction methods during the design phase. As a result, the following paragraphs describe generally what steps are included during HDD.

Where HDD is required, SDG&E would identify and excavate an entry point on the ground surface, behind which the HDD equipment would be staged. A drilling rig and working space would be established behind the entry point to conduct drilling operations and accommodate handling and disposal of drilling mud and spoils that result from the activity. The HDD then drills into the subsurface along an angled path until reaching a depth sufficient that the final pipeline will not contact or destabilize the surface feature under which the conductors are being placed; drilling is multi-directional and is controlled in an assembled control house staged within the work area. Drilling mud is injected through the drill augers to serve as a cooling agent and lubricant during drilling operations. Once the drill has cleared the surface feature to be avoided, the HDD would then drill back to the surface along the designed drill path. Once the pilot hole has been established, a second, larger auger bit would be pulled back through the pilot hole to enlarge the hole. This process is repeated using successively larger auger bits until the hole has reached a diameter sufficient to accommodate the bundled underground high-density polyethylene (HDPE) conduits in which the power line cables would be placed. Once the proper diameter has been achieved, the contractor stages the HDPE conduits in-line behind the HDD and chemically fuses the entire assembly length; the HDPE conduits would then be bundled together and pulled through the length of the bore hole in a single pull. Once the HDPE conduits are in place, they would be cleaned, swabbed, and mandreled prior to being connected to the duct packages at either end of the bore hole. Once this is completed, the ground surface would be restored to near preconstruction conditions.

Temporary and Permanent Footprint Required

The temporary and permanent footprints required to underground TL626 for both Options 1 and 2 would depend on final engineering design, the location of staging and stringing sites, and the types and locations of different construction methods used. In response to this request, SDG&E conducted preliminary evaluations of Options 1 and 2, as well as a desktop-level assessment of local conditions along Boulder Creek Road, to estimate approximate locations where jack-and-bore or HDD construction techniques may be required. In order to provide a worst-case estimate for the temporary and permanent footprints required to underground this segment of TL626, SDG&E assumed for this analysis that jack-and-bore would be used, which would require two approximately 800-square-foot temporary impact areas at each location where this technique is used (one for each entry and receiving pit). Each location requiring this technique was also assumed to have a 100-foot-long span length between bore pits to clear the surface feature or other constraint necessitating the use of jack-and-bore construction. The remaining length of the undergrounding along Boulder Creek Road was assumed to be constructed using open trenching. Anticipated temporary and permanent footprint requirements are displayed in Table 1: Temporary and Permanent Footprints.

<u>Option 1 – Pole Z372116 to Pole Z213680</u>

As shown in Figure 1: Underground Alternative – Option 1, this option would include undergrounding TL626 from pole Z372116 approximately 11.4 miles along Boulder Creek Road, at which point the line would return to an aboveground configuration. An additional approximately 1 mile of overhead alignment would be required across private lands to reconnect the underground alignment with the existing overhead alignment at pole Z213680. Along the approximately 11.4-mile-long segment of Boulder Creek Road, approximately 12 turns have an insufficient radius within the existing road bed to permit construction of underground duct packages or stringing of conductors due to minimum design requirements of the materials proposed to be used. Approximately 25 locations along this segment of Boulder Creek Road exceed 12 percent slope, which is the maximum slope feasible for underground conductor installation. Additionally, this segment of Boulder Creek Road crosses approximately 10 hydrological features through which open trenching would not be feasible. For the purposes of this analysis, these 47 locations would require jack-and-bore or HDD construction techniques to be used, resulting in approximately 75,200 square feet (approximately 1.7 acres) of temporary impacts during construction. The remaining approximately 10.5 miles of Boulder Creek Road would be open trenched, resulting in approximately 138,600 square feet (approximately 3.2 acres) of temporary impacts during construction. Assuming jack-and-bore pits require excavation to only 20 feet in depth, Option 1 would result in approximately 90,000 cubic yards of temporary excavation. Assuming one splice vault is required for every 1000 feet of the duct package, approximately 60 splice vaults would be required for Option 1.

Stringing sites would generally be placed along the road in disturbed areas, and would be required every approximately 1 mile to conduct stringing activities. Staging of materials and equipment would also be required along Boulder Creek Road or in the vicinity of work areas; assuming three staging areas along Boulder Creek Road are used, and each are approximately 2 acres in size, an additional approximately 6 acres of temporary impacts would occur during construction.

Depending on local site conditions, and additional approximately 15 steel poles and associated conductors would be required to reconnect the underground alignment with the existing alignment at pole Z213680, resulting in approximately 0.4 acre of additional temporary impacts and approximately 0.01 acre of permanent impacts.

<u>Option 2 – Pole Z372142 to Pole Z213680</u>
As shown in Figure 2: Underground Alternative – Option 2, this option would include undergrounding TL626 from pole Z372142 approximately 0.45 mile along McCoy Ranch Road until it intersects with Boulder Creek Road, then continuing underground along Boulder Creek Road for approximately 5.8 miles, at which point the line would return to an aboveground configuration. An additional approximately 1 mile of overhead alignment would be required to be constructed across private lands to reconnect the underground alignment with the existing overhead alignment at pole Z213680. Along the approximately 5.8-mile-long segment of Boulder Creek Road, approximately 9 turns have an insufficient radius within the existing road bed to permit construction of underground duct packages or stringing of conductors due to minimum design requirements of the materials proposed to be used. Approximately 12 locations along this segment of Boulder Creek Road exceed 12 percent slope, which is the maximum slope feasible for underground conductor installation. Additionally, this segment of Boulder Creek Road crosses approximately 5 hydrological features through which open trenching would not be feasible. For the purposes of this analysis, these 26 locations would require jack-and-bore construction techniques to be used, resulting in approximately 41,600 square feet (approximately 1 acre) of temporary impacts during construction. The remaining approximately 5.3 miles of Boulder Creek Road would be open trenched, resulting in approximately 69,960 square feet (approximately 1.6 acres) of temporary impacts during construction. Assuming jack-and-bore pits require excavation to only 20 feet in depth, Option 2 would result in approximately 48,286 cubic yards of temporary excavation. Assuming one splice vault is required for every 1000 feet of the conduit package, approximately 33 splice vaults would be required for Option 2.

Stringing sites would generally be placed along the road in disturbed areas, and would be required every approximately 1 mile to conduct stringing activities; stringing sites would be approximately 20 feet wide and 100 feet long to accommodate stringing equipment and materials. Staging of materials and equipment would also be required along Boulder Creek Road or in the vicinity of work areas; assuming three staging areas along Boulder Creek Road are used, and each are approximately 2 acres in size, an additional approximately 6 acres of temporary impacts would occur during construction.

Depending on local site conditions, and additional approximately 15 steel poles and associated conductors would be required to reconnect the underground alignment with the existing alignment at pole Z213680, resulting in approximately 0.4 acre of additional temporary impacts and approximately 0.01 acre of permanent impacts.

Table 1: Temporary and Permanent Footprints

Construction Activity	Temporary Footprint (Acres)		Permanent Footprint (Acres)	
	Option 1	Option 2	Option 1	Option 2
Jack-and-Bore	1.7	1	<0.1	<0.1
Open Trenching	3.2	1.6	<0.1	<0.1
Staging Areas	6	6	0	0
Stringing Sites	0.5	0.3	0	0
Overhead Alignment (including two riser poles)*	0.4	0.4	<0.1	<0.1
Total	**11.8**	**9.3**	**0.1**	**0.1**

*Based on an average of 15 poles per mile

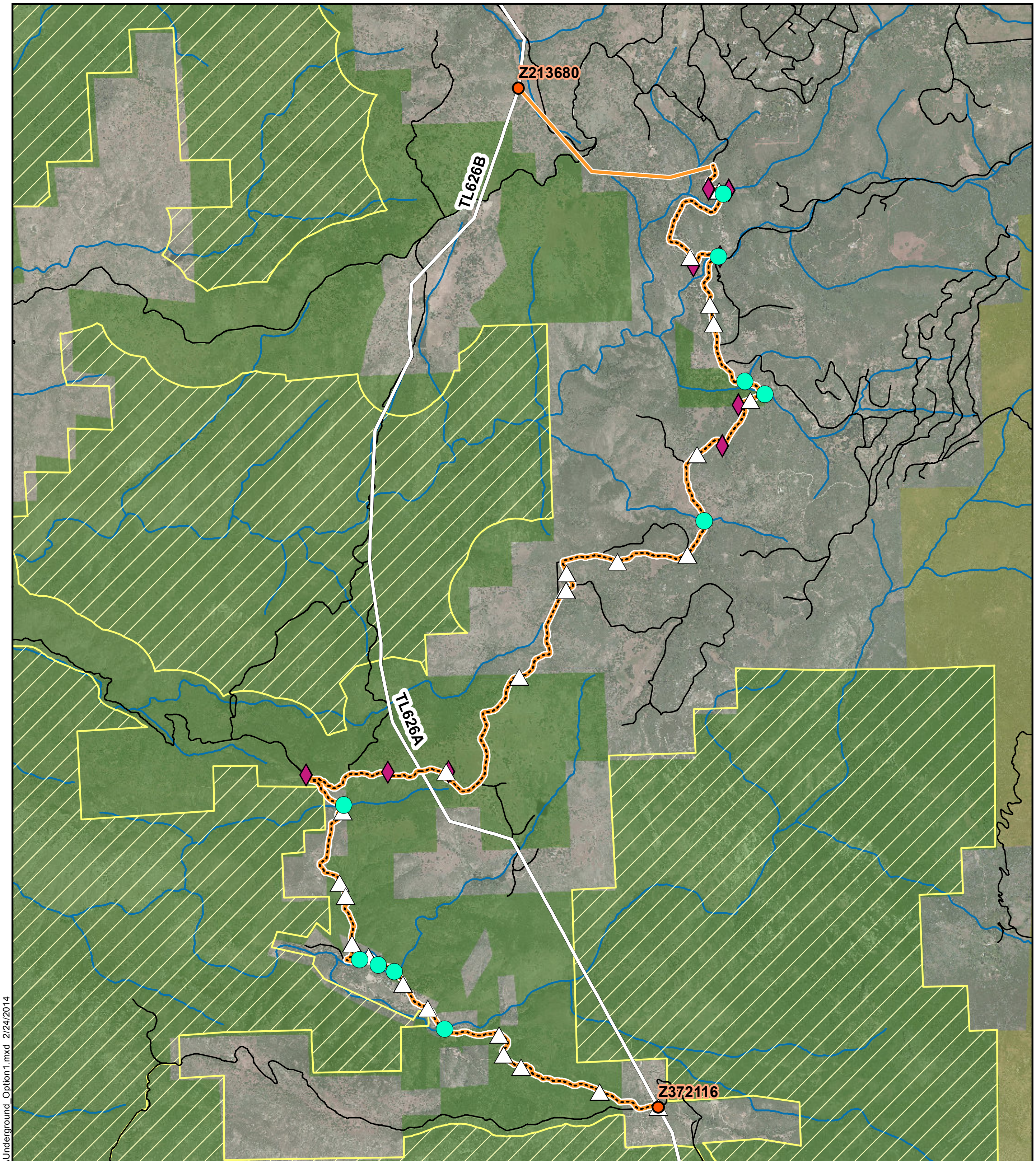

Figure 1: Underground Alternative - Option 1

CNF Power Line Replacement Projects

- Existing Pole
- Existing Power Line
- **Underground Alternative - Option 1**
- Underground
- Overhead
- Inventoried Roadless Area
- Cleveland National Forest
- Cuyamaca State Park
- Potentially Steep Location
- Hydrological Crossing
- Curve Restriction
- Roads
- Hydrological Feature
- Lake

1 inch = 1 miles

0 0.5 1 Miles

N

SDGE A Sempra Energy utility

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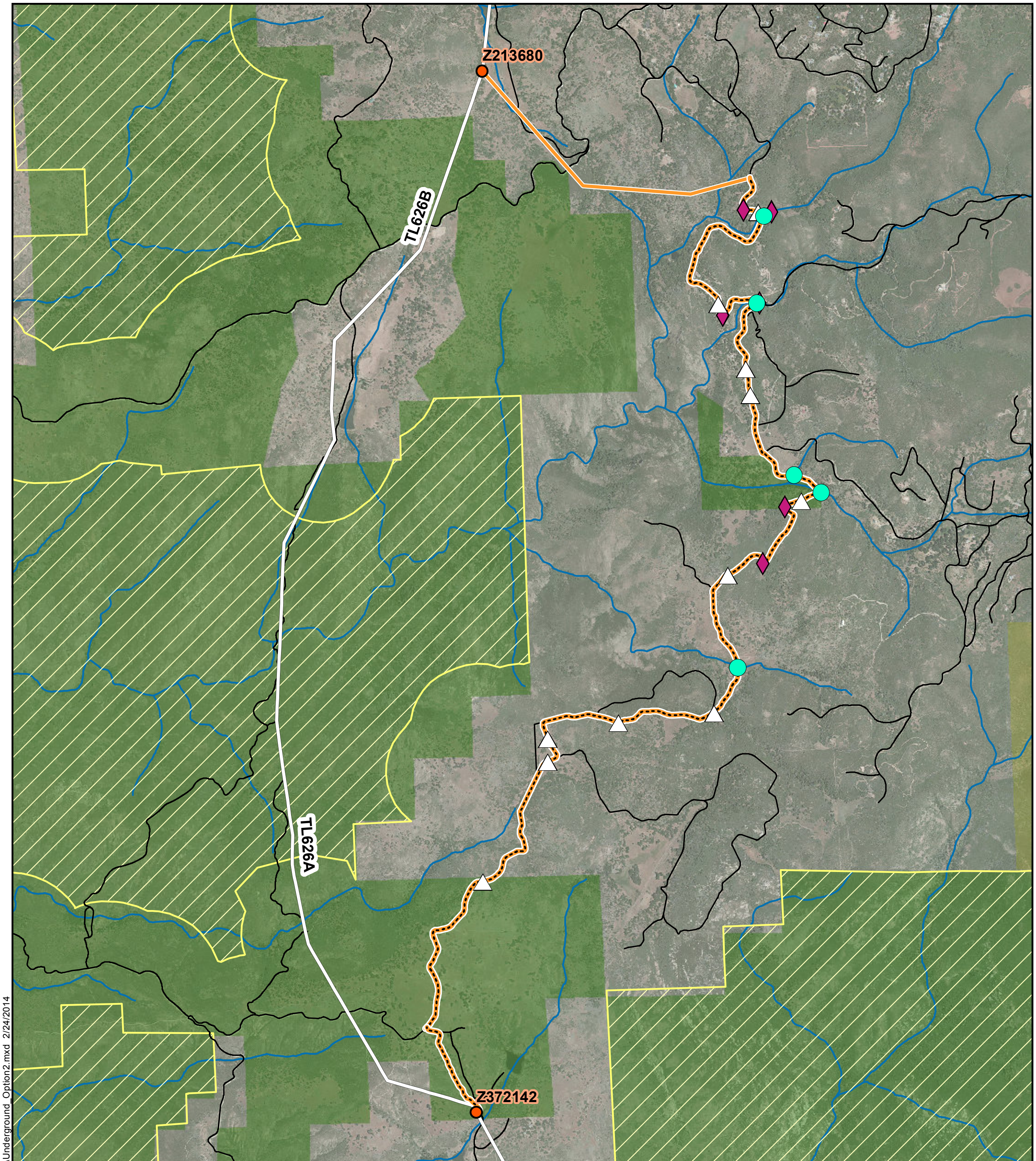

Figure 2: Underground Alternative - Option 2

CNF Power Line Replacement Projects

Existing Pole
Existing Power Line
Underground Alternative - Option 2
Underground
Overhead
Inventoried Roadless Area
Cleveland National Forest
Cuyamaca State Park
Potentially Steep Location
Hydrological Crossing
Curve Restriction
Roads
Hydrological Feature
Lake

1 inch = 1 miles
0 0.5 1 Miles

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SDGE
A Sempra Energy utility

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