



Decision No. 76975

Tenth Biennial Transmission Assessment 2018-2027

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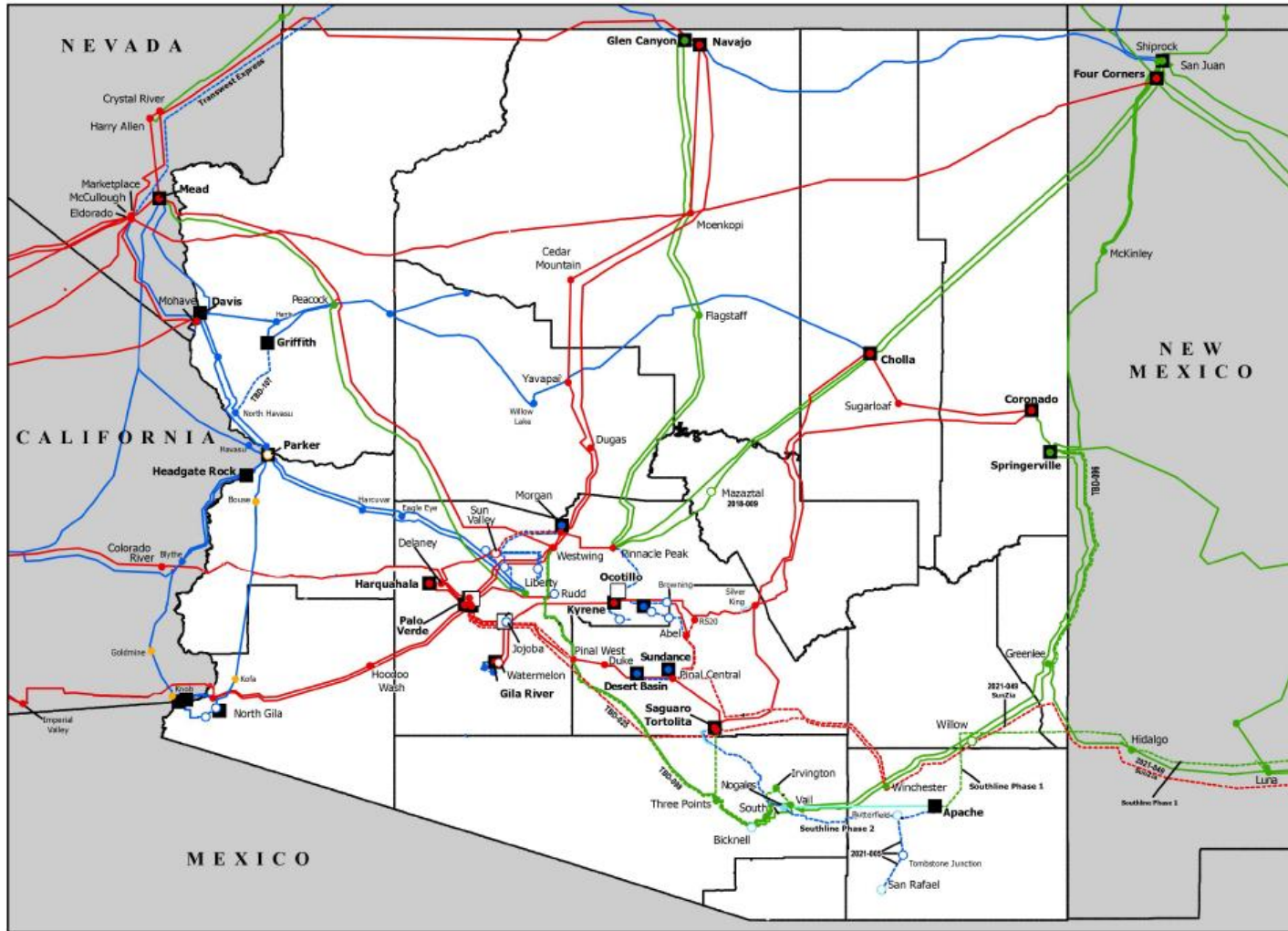
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¹ Projects with identifiers that begin with the letter “A” are slated for development in 2016-2020; “B” are slated for developed in 2021-2025; “C” are slated for post-2025 or TBD.



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Existing and Planned Transmission System Exhibit 1



Substations

Existing	Planned or Existing with Planned Upgrades or Loop-ins
● 500 kV	○ 500 kV
● 345 kV	○ 345 kV
● 230 kV	○ 230 kV
● 161 kV	○ 161 kV
● 138 kV	○ 138 kV
● 115kV	○ 115 kV

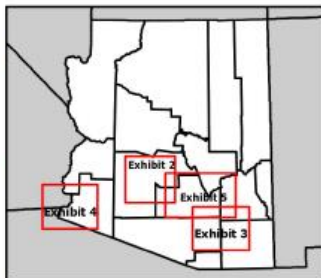
Transmission

Existing	Planned or Existing with Planned Upgrades
— 500kV AC	— 500kV AC
— 345kV AC	— 345kV AC
— 230kV AC	— 230kV AC
— 161kV AC	— 138kV AC
— 138kV AC	— 115kV AC
— 115kV AC	

Power Plants

■ Existing	□ Planned or Existing with Planned Upgrades
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Project Look-up ID Format [In Service Year-Table ID]
2021-013 - In service in 2021, STA ID 013 in Exhibit 8



Notes

1. Only pertinent transmission voltage levels shown
2. Project identification refers to details on Project Look-up table
3. Routes locations of transmission lines are conceptual only

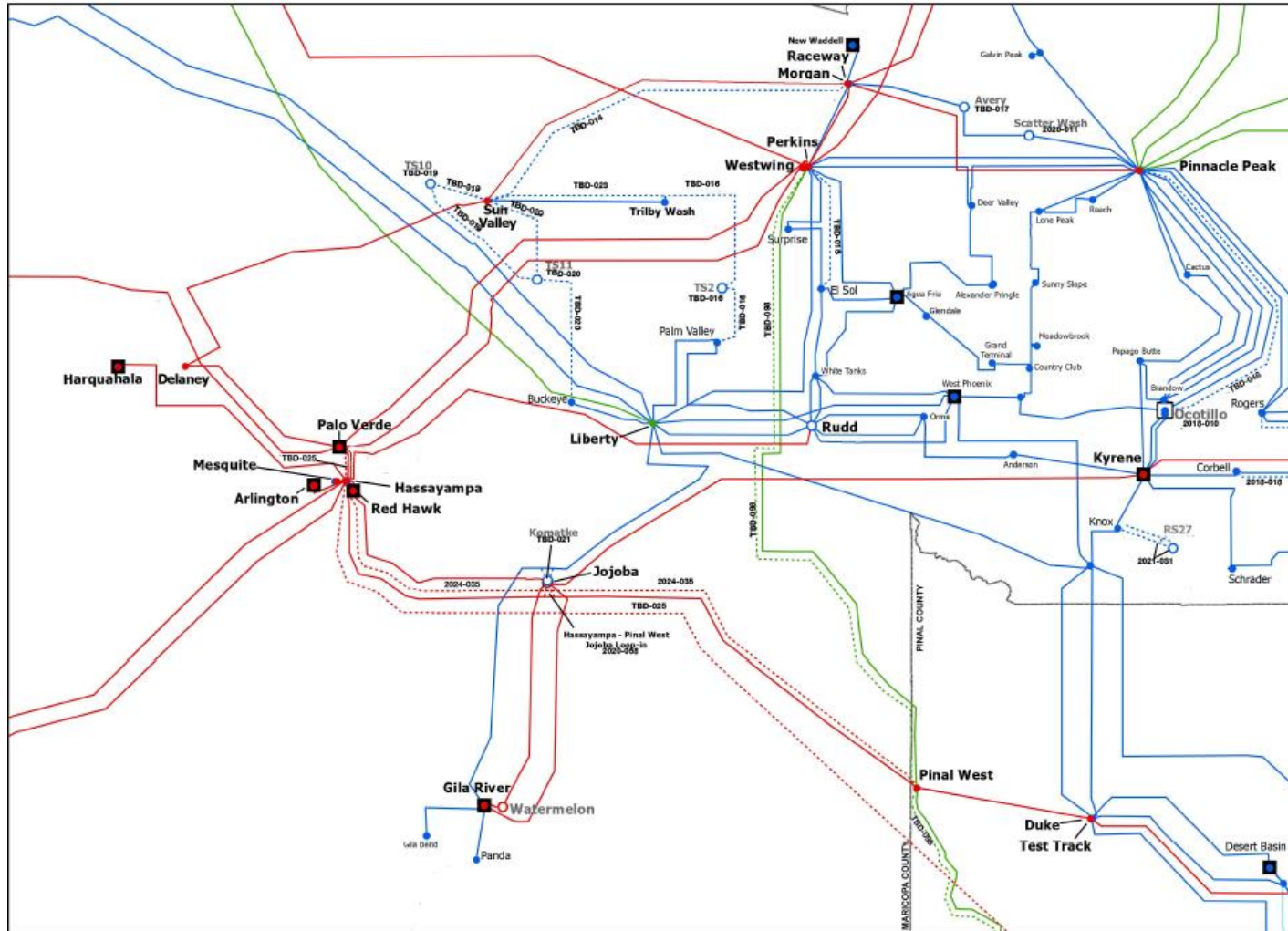
ACC Docket E-00000D-15-0001
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DISCLAIMER:
Map not to scale. ESTA International does not warrant the accuracy or location of the facilities shown.



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Maricopa County Transmission System **Exhibit 2**



Substations

Existing	Planned or Existing with Planned Upgrades or Loop-ins
● 500 kV	○ 500 kV
● 345 kV	○ 345 kV
● 230 kV	○ 230 kV
● 161 kV	○ 161 kV
● 138 kV	○ 138 kV
● 115kV	○ 115 kV

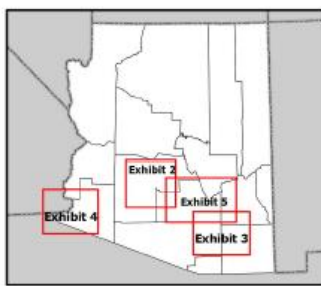
Transmission

Existing	Planned or Existing with Planned Upgrades
— 500kV AC	— 500kV AC
— 345kV AC	— 345kV AC
— 230kV AC	— 230kV AC
— 161kV AC	— 161kV AC
— 138kV AC	— 138kV AC
— 115kV AC	— 115kV AC

Power Plants

■ Existing	□ Planned or Existing with Planned Upgrades
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Project Lookup ID Format [In Service Year- Table ID]
 2021-013 = In Service in 2021, BTA ID 013 in Exhibit 0



Notes

1. Only pertinent transmission voltage levels shown
2. Project identification refers to details on Project Lookup table
3. Routes locations of transmission lines are conceptual only

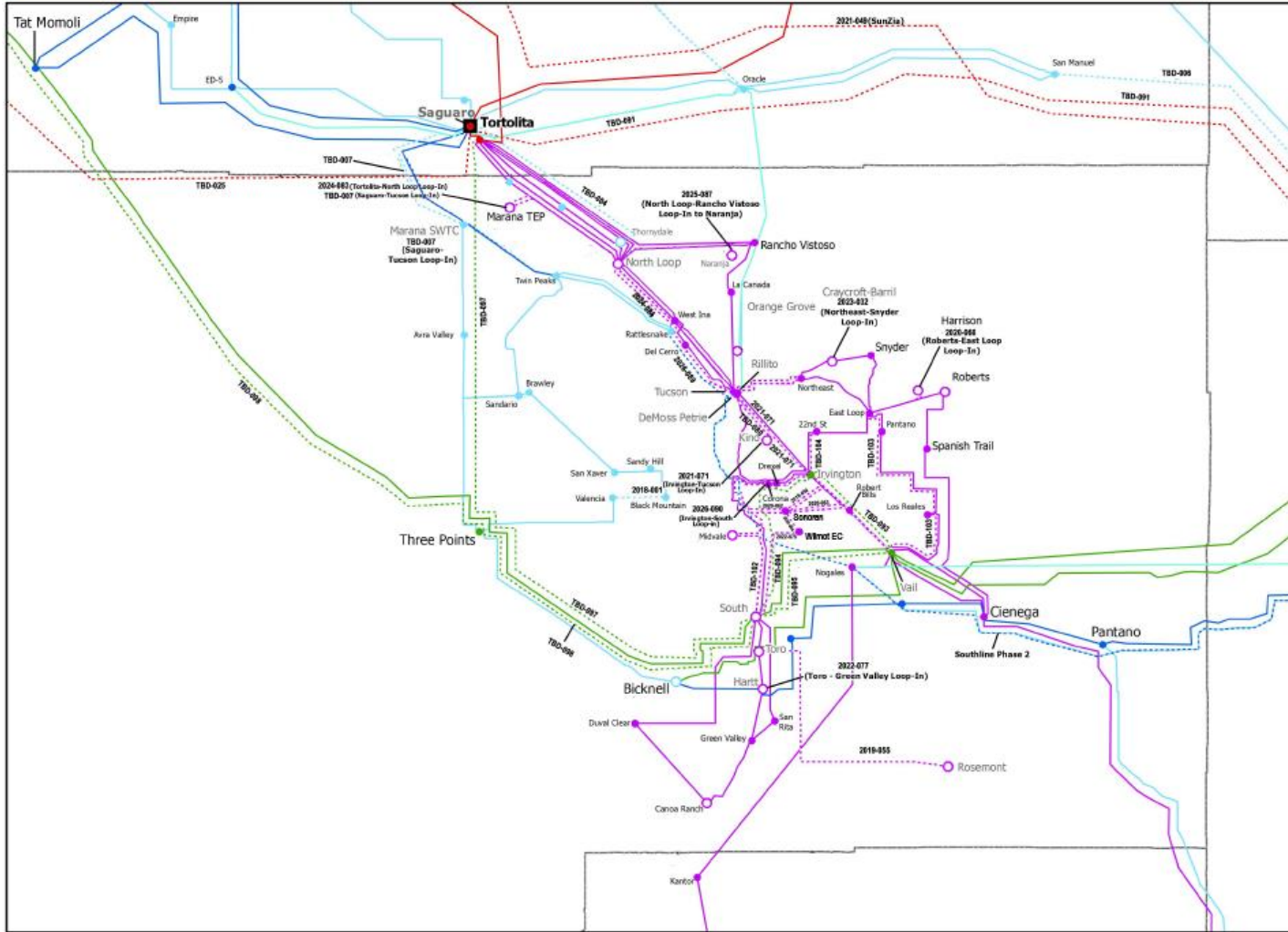
ACC Docket E-00000D-17-0001
 10th Biennial Transmission Assessment

DISCLAIMER:
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Southeastern Transmission System **Exhibit 3**



Substations

Existing	Planned or Existing with Planned Upgrades or Loop-ins
● 500 kV	○ 500 kV
● 345 kV	○ 345 kV
● 230 kV	○ 230 kV
● 161 kV	○ 161 kV
● 138 kV	○ 138 kV
● 115kV	○ 115 kV

Transmission

Existing	Planned or Existing with Planned Upgrades
— 500kV AC	— 500kV AC
— 345kV AC	— 345kV AC
— 230kV AC	— 230kV AC
— 161kV AC	— 138kV AC
— 138kV AC	— 115kV AC
— 115kV AC	

Power Plants

■ Existing	□ Planned or Existing with Planned Upgrades
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Project Look-up ID Format [In Service Year- Table ID]
2021-013 = In-service in 2021, BTA ID 013 in Exhibit 6



Notes

- Only pertinent transmission voltage levels shown
- Project identification refers to details on Project Lookup table
- Routes/locations of transmission lines are conceptual only ACC Docket E-00000D-15-0001

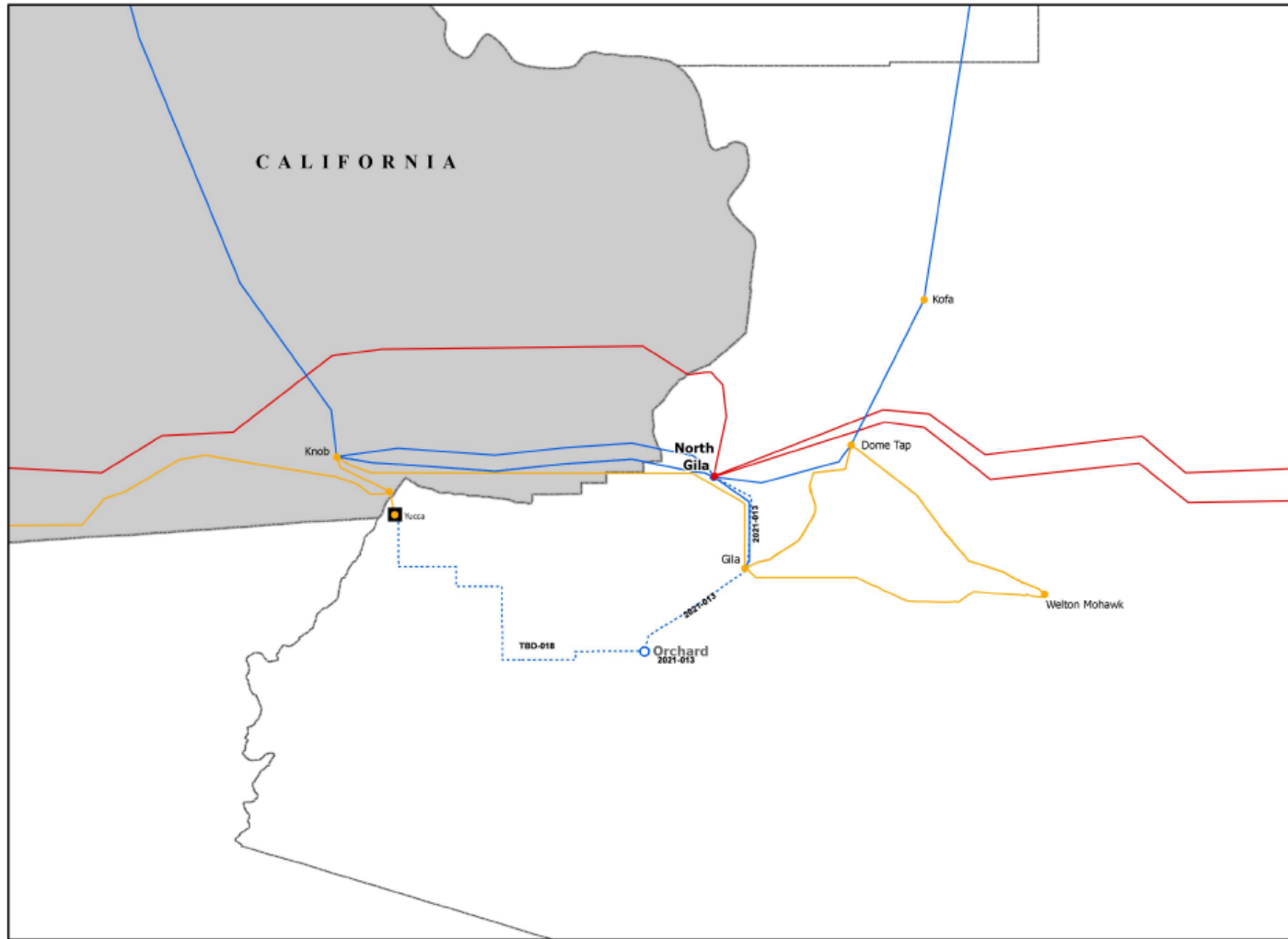
10th Biennial Transmission Assessment

DISCLAIMER: Map not to scale. ESTA International does not warrant the accuracy or location of the facilities shown.



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Yuma Transmission System **Exhibit 4**



Substations

Existing	Planned or Existing with Planned Upgrades or Loop-line
● 500 kV	○ 500 kV
● 345 kV	○ 345 kV
● 230 kV	○ 230 kV
● 161 kV	○ 161 kV
● 138 kV	○ 138 kV
● 115kV	○ 115 kV

Transmission

Existing	Planned or Existing with Planned Upgrades
— 500kV AC	- - - 500kV AC
— 345kV AC	- - - 345kV AC
— 230kV AC	- - - 230kV AC
— 161kV AC	- - - 161kV AC
— 138kV AC	- - - 138kV AC
— 115kV AC	- - - 115kV AC

Power Plants

■ Existing	□ Planned or Existing with Planned Upgrades
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Project Look-up ID Format (In Service Year- Table ID)
2021-013 = In-service in 2021, ETR ID 013 in Exhibit 3



Notes

1. Only pertinent transmission voltage levels shown
2. Project identification refers to details on Project Look-up table
3. Routes locations of transmission lines are conceptual only

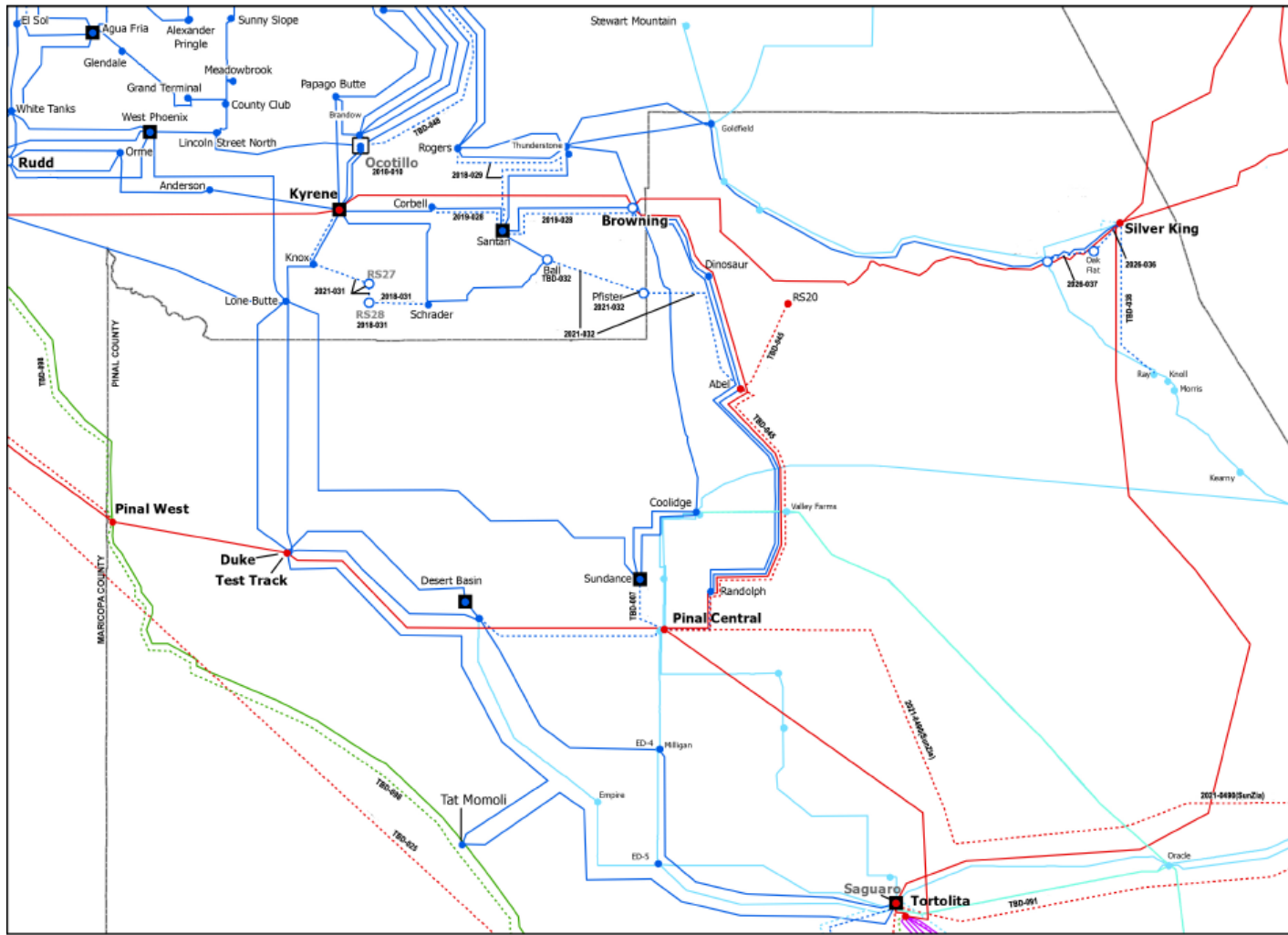
ACC Docket# E-00000D-17-0001
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DISCLAIMER:
Map not to scale. ESTA International does not warrant the accuracy or location of the facilities shown



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Pinal County Transmission System **Exhibit 5**



Substations

Existing	Planned or Existing with Planned Upgrades or Loop-ins
● 500 kV	○ 500 kV
● 345 kV	○ 345 kV
● 230 kV	○ 230 kV
● 161 kV	○ 161 kV
● 138 kV	○ 138 kV
● 115kV	○ 115 kV

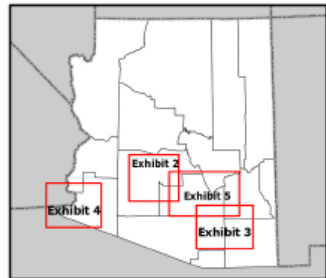
Transmission

Existing	Planned or Existing with Planned Upgrades
— 500kV AC	— 500kV AC
— 345kV AC	— 345kV AC
— 230kV AC	— 230kV AC
— 161kV AC	— 138kV AC
— 138kV AC	— 115kV AC
— 115kV AC	

Power Plants

■ Existing	□ Planned or Existing with Planned Upgrades
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Project Lookup ID Format: [In Service Year- Table ID]
2021-013 - In Service in 2021, BTA ID 013 in Exhibit 6



Notes

- Only pertinent transmission voltage levels shown
- Project identification refers to details on Project Lookup table
- Routes/locations of transmission lines are conceptual only

ACC Docket E-00000D-15-0001
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DISCLAIMER: Map not to scale. ESTA International does not warrant the accuracy or location of the facilities shown



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Exhibit 6
Arizona Planned Project Lookup Table

BTA Project ID	Description	Participants	Length (mi)	Permitting/Siting Status	Year	Voltage (kV)	Map Exhibit
001	Valencia Substation 115kV Capacitor Bank Additions	AEPCO/SWTC	-	CEC Not Required	2018	115	001
002	Dos Condados Substation 115kV Capacitor Bank Additions	AEPCO/SWTC		CEC Not Required	2018	115	002
003	Valenica - CAP Spreader Yard 115kV Line	AEPCO/SWTC	2.6	CEC Not Yet Filed	2019	115	003
004	Marana - Thornydale - Saguaro Interconnect	AEPCO/SWTC	TBD	CEC Not Yet Filed	2020	115	004
005	Tombstone Junction	AEPCO/SWTC	TBD	CEC Not Yet Filed	2021	230	005
006	Apache/Hayden - San Manuel 115kV Line	AEPCO/SWTC	4.5	CEC Approved - Case # 142	TBD	115	006
007	Saguaro to Tucson 115 kV Line Loop-in To Marina	AEPCO/SWTC	TBD	CEC Not Yet Filed	TBD	115	007
008	Bagdad Interconnection Project	AEPCO/SWTC & APS	1	CEC Filed - Case # 179	2018	115	008
009	Mazatzal345/69kV Substation	APS	0.95	"CEC Approved – Decision #72302	2018	345	009
010	Ocotillo Modernization Project	APS	1	CEC Approved - Decision #74812	2018	230	010
011	Scatter Wash 230/69kV Substation	APS	1	CEC Approved- Case #120 - Decision #65997	2020	230	011



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012	TS4 230/69kV Substation	APS	1	CEC Approved - Decision #73937	2020	230	012
013	North Gila - Orchard 230kV Line	APS	13	CEC Approved – Case #163 – Decision #72801	2021	230	013
014	Morgan - Sun Valley 230kV Line	APS	38	CEC Approved – Decision #70850	TBD	230	014
015	EI Sol- Westwing 230kV Line	APS	11	CEC Approved – Docket #U-1345	TBD	230	015
016	Palm Valley - TS2- Trilby Wash 230kV Line # 2	APS	12	CEC Approved – Decision #67828	TBD	230	016
017	Avery 230/69kV Substation	APS	1	CEC Approved - Case #120 - Decision #65997 Amended 4/10/2013 Decision #73824	TBD	230	017
018	Orchard - Yucca 230kV Line	APS	19	CEC Approved – Case #163 – Decision #72801	TBD	230	018
019	Sun Valley - TS10 - TS11 230kV Line	APS	TBD	CEC Not Yet Filed	TBD	230	019
020	Buckeye - TSII- Sun Valley 230kV Line	APS	TBD	CEC Not Yet Filed	TBD	230	020
021	Komatke 230/69kV Substation	APS	TBD	CEC Approved - Decision #62960	TBD	230	021
022	TS2 230/69kV Substation	APS	TBD	CEC Approved - Decision #73937	TBD	230	022
023	Sun Valley - Trilby Wash 230kV Line Circuit #2	APS	TBD	CEC Approved - Decision #67828	TBD	230	023



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024	Bagdad 115kV/69kV Back-Up	APS	TBD	CEC Not Yet Filed	TBD	115	024
025	Palo Verde - Saguaro 500kV Line	APS, CATS	130	CEC Approved - Case #24 - Decision #46802	TBD	500	025
026	Morgan- Sun Valley 500kV Line	APS, CAWCD	38	CEC Approved – Decision #70850	2018	500	026
027	Pinal Central- Sundance 230kV Line	APS, ED2	6	CEC Approved – Case #136 – Decision #70325	TBD	230	027
028	Browning - Corbell 230 kV Line Reconfiguration	SRP	0.02	CEC Not Required	2018	230	028
029	Rogers - Santan 230kV Line Reconfiguration	SRP	0.01	CEC Not Required	2018	230	029
030	Coolidge - Hayden 115kV Reroute	SRP	1.5	CEC Not Yet Filed	2020	115	030
031	Price Road Corridor - Knox - Henshaw 230kV Line	SRP	7	CEC Approved - Case #175 - Decision #76371	2021	230	031
032	Abel- Pfister - Ball 230kV	SRP	20	CEC Approved - Case #148 - Decision #71441	2021	230	032
033	Copper Crossing - Abel 230 kV	SRP	1	CEC Not Yet Filed	2023	230	033
034	Southeast Power Link	SRP	TBD	CEC Not Yet Filed	2024	230	034
035	Hassayampa - Pinal West 500kV #2 Line	SRP	51	CEC Approved - Case #124 - Decision #67012	2024	500	035



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036	Silver King- New Oak Flat - New Superior 230kV	SRP	6.5	CEC Not Yet Filed	2026	230	036
037	Superior - Silver King 115kV Re-route	SRP	1	CEC Approved - Case #166 - Decisions #73551, #76594	2027	115	037
038	Eastern Mining Expansion	SRP	TBD	CEC Not Yet Filed	TBD		038
039	Superior 230kV Loop-in	SRP	TBD	CEC Not Yet Filed	TBD	230	039
040	Thunderstone - Browning 230kV	SRP	TBD	CEC Not Yet Filed	TBD	230	040
041	Silver King - Knoll - New Hayden 230kV	SRP	TBD	CEC Not Yet Filed	TBD	230	041
042	New Hayden 115kV Loop-in	SRP	TBD	CEC Not Yet Filed	TBD	115	042
043	RS25 Project	SRP	TBD	CEC Not Yet Filed	TBD		043
044	RS26 Project	SRP	TBD	CEC Not Yet Filed	TBD		044
045	Pinal Central - Abel - RS-20 500kV	SRP	TBD	CEC Not Yet Filed	TBD	500	045
046	Palo Verde - Saguaro 500kV	SRP	TBD	CEC Not Yet Filed	TBD	500	046
047	Ball (RS17) 230kV Loop-in	SRP	TBD	CEC Not Yet Filed	TBD	230	047
048	Pinnacle Peak - Brandow 230kV	SRP	TBD	CEC Not Yet Filed	TBD	230	048
049	SunZia Southwest Transmission 500kV Project	SWPG, SRP, TEP, Shell, TSGT	200	CEC Approved - Case #171 - Decision #75464	2021	500	049



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050	North Loop - Rancho Vistoso 138-kV Line Re-Conductor	TEP	10.5	CEC Not Yet Filed	2018	138	050
051	La Canada - Rillito 138kV Line into Orange Grove 138kV Substation	TEP	Tap off existing line	CEC Not Required	2018	138	051
052	Reconfiguration of Tortolita - Ranch Vistoso 138kV to North Loop - Rancho Vistoso 138kV	TEP	22	CEC Not Yet Filed	2018	138	052
053	Irvington - 22nd Street 138-kV Line Re-Conductor	TEP	4	Case No. 66	2019	138	053
054	Loop-in of Irvington - South 138kV Line into Sonoran 138kV Substation	TEP	Tap off existing line	CEC Not Required	2019	138	054
055	Toro - Rosemont 138kV Line	TEP	13.2	Case # 164 Dependent upon approval of Mine Record of Decision from United States Forestry Service	2019	138	055
056	Orange Grove Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2019	138	056
057	Tortolita Substation 138-kV Capacitor Bank #2 Addition	TEP	-	CEC Not Required	2019	138	057
058	Hassayampa - Pinal West 500kV Line Loop-in to Jojoba	TEP	less than 3 spans	Case # 124	2020	500	058



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059	Vail - East Loop - Phase 4	TEP	4	Case # 8	2020	138	059
060	Orange Grove - Rillito 138kV Line Re-Conductor	TEP	1.6	CEC Not Required	2020	138	060
061	Rancho Vistoso - La Canada 138kV Line Re-Conductor	TEP	4.4	CEC Not Required	2020	138	061
062	Loop-in of Irvington - Vail 138kV Line into Sonoran 138kV Substation	TEP	Tap off existing line	CEC Not Required	2020	138	062
063	Loop-in of Irvington - Robert Bills 138kV Line into Sonoran 138kV Substation	TEP	Tap off existing line	CEC Not Required	2020	138	063
064	138kV Line from Sonoran to 138 KV Wilmot Energy Center Substation to 138kV South Substation Phase #1	TEP	4	CEC Not Yet Filed	2020	138	064
065	La Canada - Orange Grove 138kV Line Re-Conductor	TEP	Tap off existing line	CEC Not Yet Filed	2020	138	065
066	Harrison Loop-in of Roberts - East Loop 138kV Line	TEP	4	CEC Approved - Case # 8	2020	138	066
067	Irvin Iton Substation 138-kV Capacitor Bank #3 Addition	TEP	-	CEC Not Required	2020	138	067



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068	Pantano Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2020	138	068
069	22nd Street Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2020	138	069
070	Irvington Substation - Kino 138kV Substation	TEP	6	CEC Not Yet Filed	2021	138	070
071	Irvington -Tucson 138kV Line #2 Loop-in with Kino	TEP	10.9	CEC Not Yet Filed	2021	138	071
072	Drexel Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2021	138	072
073	West Ina Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2021	138	073
074	Tortolita Substation 138-kV Capacitor Bank #3 Addition	TEP	-	CEC Not Required	2021	138	074
075	138kV Line from Sonoran to 138 KV Wilmot Energy Center Substation to 138kV South Substation Phase #2	TEP	12	CEC Not Yet Filed	2022	138	075
076	Tortolita - North Loop 138kV Line Re-Conductor	TEP	14.3	CEC Not Yet Filed	2022	138	076
077	Hartt Loop-in on Toro - Green Valley (South -	TEP	Tap off existing line	CEC Not Yet Filed	2022	138	077



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	Green Valley) 138kV Line						
078	Tortolita Substation 138-kV Capacitor Bank #4 Addition	TEP	-	CEC Not Required	2022	138	078
079	North Loop Substation 138-kV Capacitor Bank #3 Addition	TEP	-	CEC Not Required	2022	138	079
080	DeMoss Petrie Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2022	138	080
081	Northeast - Synder 138kV into Craycroft - Barril 138kV Substation	TEP	Tap off existing line	CEC Not Required	2023	138	081
082	Craycroft-Barrill Loop-in of Northeast - Snyder 138kV Line	TEP	Tap off existing line	CEC Not Yet Filed	2023	138	082
083	Interconnection of Tortolita - North Loop #5 with TEP Marana 138kV Substation	TEP	4	CEC Not Yet Filed	2024	138	083
084	139kV Line from North Loop Substation to El Camino Del Cerro Substation	TEP	14.3	CEC Not Yet Filed	2024	138	084
085	Marina Loop-in on one Tortolita - North Loop 138kV Circuit	TEP	4	CEC Not Yet Filed	2024	138	085
086	North Loop Substation 138-kV Capacitor Bank #4 Addition	TEP	-	CEC Not Required	2024	138	086



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087	Interconnection of North Loop - Rancho Vistoso 138-kV Line with future Naranja 138-kV Substation	TEP	1	CEC Not Yet Filed	2025	138	087
088	Naranja Substation 138-kV Capacitor Banks #1 & #2 Addition	TEP	-	CEC Not Required	2025	138	088
089	Del Cerro - Tucson 138-kV Line Re-Conductor	TEP	6.75	CEC Not Required	2026	138	089
090	Interconnection of Irvington - South Loop 138-kV Line to future Corono 138-kV Substation	TEP	1	CEC Not Yet Filed	2026	138	090
091	Saguaro Substation - Winchester Substation	TEP	80	Decision No. 46801	TBD	500	091
092	Gila River - Pinal West 500-kV	TEP	50	CEC Not Yet Filed	TBD	500	092
093	Vail Substation - Irvington Substation	TEP	11	CEC Not Yet Filed	TBD	345	093
094	Irvington Substation - South Substation	TEP	16	CEC Not Yet Filed	TBD	345	094
095	Vail Substation to South Substation - 2nd Circuit	TEP	14	Case # 15	TBD	345	095
096	Springerville Substation - Greenlee Substation - 2nd Circuit	TEP	27	Case # 12, 30, 63 and 73	TBD	345	096
097	Tortolita Substation - South Substation	TEP	68	Case # 50	TBD	345	097



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098	Westwing Substation - South Substation - 2nd Circuit	TEP	178	Case # 15	TBD	345	098
099	Irvington - Vail 138-kV Line Re-Conductor	TEP	11	CEC Not Required	TBD	138	099
100	Irvington - RobertBills - Vail 138-kV Line Re-Conductor	TEP	14	CEC Not Required	TBD	138	100
101	Irvington - South 138-kV Line Re-Conductor	TEP	18	CEC Not Required	TBD	138	101
102	Irvington - Drexel - Midvale - South 138-kV Line Re-Conductor	TEP	18	CEC Not Required	TBD	138	102
103	Vail - East Loop - Phase 3 Line #3 138kV	TEP	22	CEC Approved - Case # 8	TBD	138	103
104	Irvington - East Loop Project - Phase 3 (Irvington - 22nd Street #2 Line)	TEP	9	CEC Approved - Case # 66	TBD	138	104
105	Sonoita - Gateway - Valencia 138kV	UNS Electric	4.2	CEC Approved - Case # 176	2019	138	105
106	Re-Conductor WAPA Nogales Tap - Kantor	UNS Electric	30	CEC Approved - Case # 176	2019	138	106
107	Griffith - North Havasu 230kV Line	UNS Electric	40	CEC Approved - Case # 88	TBD	230	107
108	Golden Valley 230kV Line	UNS Electric	17	CEC Not Yet Filed	TBD	230	108
109	Vail to Gateway 138-kV Transmission Line, 2nd Circuit	UNS Electric	60	CEC Approved - Case # 176	TBD	138	109



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110	Gateway to Valenica 138kV	UNS Electric	4.2	CEC Approved - Case # 176	TBD	138	110
111	230kv Line from Gateway Substation to US/Mexico Border	UNS Electric	2	CEC Approved - Case # 176	TBD	230	111
112	Kantor Substation 138- kV Capacitor Bank Additions	UNSE	-	CEC Not Required	2019	138	112
113	Gateway Substation 138- kV Capacitor Bank Additions	UNSE	-	CEC Not Required	2019	138	113



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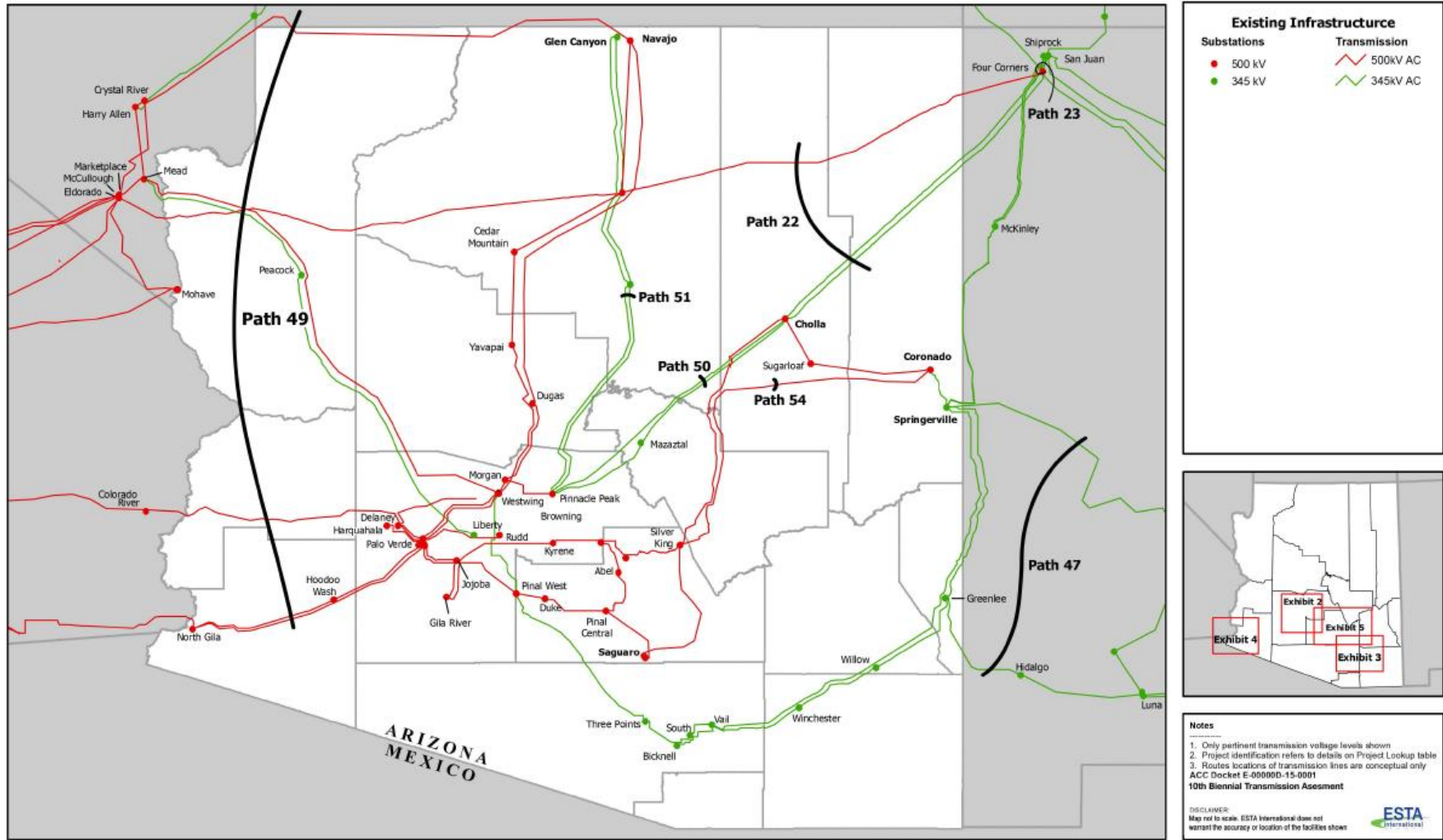
Exhibit 7			
WECC Path(s) Affecting Arizona Table			
WECC Path	WECC Path Name	Components	Rating
22	Southwest of Four Corners	Four Corners - Moenkopi 500 kV	East-West = 2325 MW West-East = Undefined
		Four Corners - Cholla 345 kV #1	
		Four Corners - Cholla 345 kV #2	
23	Four Corners 345/500 Qualified Path	Flow on 345/500 Transformer	345 to 500 kV = 1,000 MW 500 to 345 kV = 1,000 MW
47	Southern New Mexico	West Mesa - Arroyo 345 kV	Simultaneous Firm = 940 MW Non-simultaneous = 1,048 MW
		Springerville - Luna 345 kV	
		Greenlee - Hidalgo 345 kV	
		Belen - Bernardo 115 kV	
48	Northern New Mexico	Four Corners - West Mesa 345 kV	Simultaneous Firm = 1849 MW ² Non-simultaneous = 2150 MW
		San Juan - BA 345 kV	
		San Juan - Ojo 345 kV	
		McKinley/Yah-Ta-Hey 345/115 kV Transformer	
		Walsenburg - Gladstone 230 kV	
		Bisti - Ambrosia 230 kV	
		<i>Minus flow on Belen – Bernardo 115 kV</i>	
		<i>Minus flow on West Mesa – Arroyo 345 kV line</i>	
49	East of Colorado River (EOR)	Navajo - Crystal - McCullough 500 kV	East-West = 10,100 MW West-East = Undefined
		Moenkopi - El Dorado 500 kV	
		Liberty - Peacock - Mead 500 kV	
		Palo Verde – Colorado River 500 kV	
		Hassayampa – Hoodoo Wash 500 kV	
		Hassayampa – North Gila 500 kV	
		Perkins - Mead 500 kV	
50	Cholla - Pinnacle Peak	Cholla – Preacher Canyon 345 kV	East - West = 1,200 MW West - East = Undefined
		Cholla - Pinnacle Peak 345 kV	
51	Southern Navajo	Moenkopi – Cedar Mountain 500 kV	North - South = 2,800 MW South – North = Undefined
		Navajo – Dugas 500 kV	
54	Coronado - Silver King	Coronado - Silver King 500 kV	Coronado – Silver King = 1,494 MW Silver King – Coronado = Undefined

² Simultaneous limit with Path 47 is dependent on the amount of path 47 import scheduled through the Arroyo phase-shifting transformer.



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WECC Paths Affecting Arizona **Exhibit 8**





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Exhibit 9												
Arizona Demand Forecast Data												
Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
APS												
7th BTA Loads (MW)	7,442	7,614	7,797	7,979	8,160	8,307	N/A	N/A	N/A	N/A	N/A	N/A
8th BTA Loads (MW)	7,113	7,265	7,436	7,620	7,784	7,972	8,185	8,400	N/A	N/A	N/A	N/A
9th BTA Loads (MW)	6,848	6,953	7,100	7,242	7,362	7,554	7,774	7,992	8,209	8,436	N/A	N/A
10th BTA Loads (MW)	N/A	N/A	7,011	7,126	7,277	7,473	7,711	7,929	8,133	8,370	8,601	8,830
Change in 10th BTA (MW)	N/A	N/A	-89	-116	-85	-81	-63	-63	-76	-66	N/A	N/A
Change in 10th BTA (as %)	N/A	N/A	-1.25%	-1.60%	-1.15%	-1.07%	-0.81%	-0.79%	-0.93%	-0.78%	N/A	N/A
SRP												
7th BTA Loads (MW)	7,201	7,354	7,528	7,694	7,858	N/A	N/A	N/A	N/A	N/A		
8th BTA Loads (MW)	7,221	7,404	7,608	7,846	8,075	8,403	8,661	N/A	N/A	N/A		
9th BTA Loads (MW)	6,926	7,093	7,296	7,456	7,612	7,765	7,948	8,131	8,335			
10th BTA Loads (MW)	N/A	N/A	7,327	7,403	7,545	7,642	7,801	8,008	8,234	8,395	8,592	8,756
Change in 10th BTA (MW)	N/A	N/A	31	-53	-67	-123	-147	-123	-101	8,395	8,592	8,756
Change in 10th BTA (as %)	N/A	N/A	0.42%	-0.71%	-0.88%	-1.58%	-1.85%	-1.51%	-1.21%	N/A	N/A	N/A
AEPCO/SWTC												
7th BTA Loads (MW)	711	731	752	778	800	825	N/A	N/A	N/A	N/A		
8th BTA Loads (MW)	675	694	714	733	753	775	797	819	N/A	N/A		
9th BTA Loads (MW)	640	656	671	689	706	724	742	760	779	798		
10th BTA Loads (MW)	N/A	N/A	647	663	675	690	706	721	740	758	768	777
Change in 10th BTA (MW)	N/A	N/A	-24	-26	-31	-34	-36	-39	-39	-41	768	777
Change in 10th BTA (as %)	N/A	N/A	-3.58%	-3.75%	-4.41%	-4.69%	-4.87%	-5.17%	-5.00%	-5.07%	N/A	N/A
TEP and UNSE												
7th BTA Loads (MW)	2,984	3,024	3,062	3,102	3,147	3,206	N/A	N/A	N/A	N/A		
8th BTA Loads (MW)	2,891	2,919	2,955	2,980	3,019	3,059	3,091	3,096	N/A	N/A		
9th BTA Loads (MW)	2,823	2,901	2,978	3,048	3,076	3,073	3,110	3,166	3,165	3,190		
10th BTA Loads (MW)	N/A	N/A	2,917	3,018	3,206	3,198	3,230	3,282	3,281	3,302	3,337	3,333
Change in 10th BTA (MW)	N/A	N/A	-61	-30	130	125	120	116	116	112	3,337	3,333
Change in 10th BTA (as %)	N/A	N/A	-2.05%	-0.98%	4.23%	4.07%	3.86%	3.66%	3.67%	3.51%	N/A	N/A
AZ Total												



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7th BTA Loads (MW)	18,338	18,723	19,139	19,553	19,965							
8th BTA Loads (MW)	17,900	18,282	18,713	19,179	19,631	20,209	20,734					
9th BTA Loads (MW)	17,237	17,603	18,045	18,435	18,756	19,116	19,574	20,049	20,488			
10th BTA Loads (MW)			17,902	18,210	18,703	19,003	19,448	19,940	20,388	20,825	21,298	21,696
Change in 10th BTA (MW)			-143	-225	-53	-113	-126	-109	-100	20,825	21,298	21,696
Change in 10th BTA (as %)			-0.79%	-1.22%	-0.28%	-0.59%	-0.64%	-0.55%	-0.49%	N/A	N/A	N/A
¹ Studies performed by SWTC for the 2012-2021 and 2014-2023 ACC Ten Year Plan were stressed using non-coincident load values for worst case scenario analysis.												



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Exhibit 10					
Plan Changes Between Ninth and Tenth BTAs					
Utility	Description	kV	Status	Permitting/Siting status	Previous Alias
APS	Delaney –Palo Verde 500kV line	500	Completed	CEC approved - Case # 138	
APS	Delaney –Sun Valley 500kV line	500	Completed	CEC approved - Case # 138	
APS	Delaney 500/69kV substation	500	Completed	CEC approved - Case # 138	
APS	Sun Valley –Trilby Wash 230kV line #1	230	Completed	CEC approved - Case # 127	
APS	Ocotillo Modernization Project 230kV Collector System	230	Completed	CEC approved - Case # 169	
APS	Sun Valley-Morgan 500kV line	500	Completed	CEC approved - Case # 138	
APS	Mazatzal 345/69kV Substation	345	Completed	CEC approved - Case # 160	
SRP	12 Ohm Series Reactors on Palo Verde – Hassayampa 500kV Ties #1-3	500	Completed	CEC Not Required	
TEP	CanoaRanch 138kV Capacitor Bank #1 Addition	138	Completed	CEC Not Required	
TEP	North Loop 138kV Capacitor Bank #1 and #2 Upgrade	138	Completed	CEC Not Required	
TEP	Roberts 138kV Capacitor Bank #1 Addition	138	Completed	CEC Not Required	
TEP	Midvale 138kV Capacitor Bank #1 Addition	138	Completed	CEC Not Required	
TEP	Tortolita Substation –Rancho Vistoso Substation Reconfiguration to Tortolita Substation –North Loop Substation #5 and North Loop Substation –Rancho Vistoso Substation	138	Completed	CEC Not Yet Filed	
TEP	Irvington –22ndStreet 138kV Line Reconductor	138	Advanced In-service date from 2020 to 2018	CEC approved - Case # 66	



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TEP	Del Cerro –Tucson 138kV Line Reconductor	138	Advanced In-service date from 2023 to 2020	CEC Not Required	
TEP	Irvington –Vail 138kV Line Reconductor	138	Advanced In-service date to 2020	CEC Not Required	
TEP	Hassayampa – Pinal West 500kV Loop-in to Jojoba Switchyard	500	Deferred In-Service date from 2017 to 2020	CEC approved - Case # 124	
UNSE	Golden Valley 230kV Line	230	Deferred In-Service date from 2021 to TBD	CEC Not Yet Filed	
SRP	Superior –Silver King 115kV Reroute	115	In-service changed from 2017 to 2027	CEC approved - Case # 166	
SRP	Price Road Corridor		In-service changed from 2018 to 2021	CEC approved - Case # 175	
SRP	Copper Crossing Energy Center– Abel 230kV	230	In-service changed from 2021 to 2023	CEC Not Yet Filed	
APS	Scatter Wash 230/69KV substation	230	In-service changed from TBD to 2020	CEC approved - Case # 120	
APS	Freedom substation 230/69kV	230	In-service changed from TBD to 2020	CEC approved - Case # 122	TS4 Substation
SRP	Coolidge –Hayden 115kV Reroute	115	In-service changed to 2020	CEC Not Yet Filed	
SRP	Southeast Power Link		In-service changed to 2024	CEC Filed - Case # 180	Mesa Technology Corridor
AEPCO	Valencia Substation 115kV Capacitor Bank Additions	115	New	CEC Not Required	
AEPCO	Dos Condados Substation 115kV Capacitor Bank Additions	115	New	CEC Not Required	
AEPCO	Bagdad Interconnection Project	115	New	CEC Filed - Case # 179	
APS	Bagdad Township 115/69kV Back-up Project	115	New	CEC Not Yet Filed	



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TEP	Gila River To Pinal West 500kV Transmission Line	500	New	CEC Not Yet Filed	
TEP	Irvington 138kV Line Relocation	138	New	CEC Not Yet Filed	
TEP	Loop-in of Irvington –South 138kV Line into future Sonoran Substation	138	New	CEC Not Required	
TEP	La Canada –Orange Grove 138kV Line Reconductor	138	New	CEC Not Required	
TEP	Orange Grove –Rillito 138kV Line Reconductor	138	New	CEC Not Required	
TEP	Rancho Vistoso –La Canada 138kV Line Reconductor	138	New	CEC Not Required	
TEP	Loop-in of Irvington –Vail 138kV Line into future Sonoran Substation	138	New	CEC Not Required	
TEP	Loop-in of Irvington –Robert Bills 138kV Line into future Sonoran Substation	138	New	CEC Not Required	
TEP	New future Sonoran Substation – future Wilmot Energy Center Substation to South Substation 138KV line	138	New	CEC Not Yet Filed	
TEP	Irvington Substation–Future Kino Substation 138kV Line	138	New	CEC Not Yet Filed	
TEP	Tortolita –North Loop #5 Reconductor and Conversion to Double Circuit	138	New	CEC Not Required	
TEP	New North Loop –El Camino Del Cerro 138kV Line	138	New	CEC Not Yet Filed	
TEP	Future Kino Substation to Tucson 138kV Line	138	New	CEC Not Yet Filed	
TEP	Future Kino Substation to DeMossPetrie 138kV Line	138	New	CEC Not Yet Filed	
TEP	Orange Grove 138kV Capacitor Bank #1 Addition	138	New	CEC Not Required	
TEP	Tortolita 138kV Capacitor Bank #2 Addition	138	New	CEC Not Required	
TEP	Irvington 138kV Capacitor Bank #3 Addition	138	New	CEC Not Required	



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TEP	Pantano 138kV Capacitor Bank #1 Addition	138	New	CEC Not Required	
TEP	22nd Street 138kV Capacitor Bank #1 Addition	138	New	CEC Not Required	
TEP	Drexel 138kV Capacitor Bank #1 Addition	138	New	CEC Not Required	
TEP	West Ina 138kV Capacitor Bank Addition	138	New	CEC Not Required	
TEP	Tortolita 138kV Capacitor Bank #3 Addition	138	New	CEC Not Required	
TEP	Tortolita 138kV Capacitor Bank #4 Addition	138	New	CEC Not Required	
TEP	North Loop 138kV Capacitor Bank #3 Addition	138	New	CEC Not Required	
TEP	DeMoss Petrie 138kV Capacitor Bank #1 Addition	138	New	CEC Not Required	
TEP	North Loop 138kV Capacitor Bank #4 Addition	138	New	CEC Not Required	
TEP	Naranja 138kV Capacitor Banks #1 & #2 Additions	138	New	CEC Not Required	
UNSE	Sonoita–Gateway –Valencia 138kV Transmission Line	138	New	CEC approved - Case # 176	
UNSE	Reconductor WAPA Nogales Tap to Kantor Portion of Existing 138kV Vail to Kantor Transmission Line	138	New	CEC Not Required	
UNSE	Kantor Substation 138kV Capacitor Bank Additions	138	New	CEC Not Required	
UNSE	Gateway Substation 138kV Capacitor Bank Additions	138	New	CEC Not Required	
UNSE	230kV Transmission Line from Future Gateway Substation to US/Mexico Border	230	New	CEC approved - Case # 176	
UNSE	Vail to Gateway 138kV Transmission Line, 2nd Circuit	138	New	CEC approved - Case # 176	
UNSE	Gateway –Valencia 138kV Transmission Line	138	New	CEC approved - Case # 176	
AEPCO	North Loop to Rattlesnake 115 KV Transmission Project	115	Removed	CEC amended - Case # 152	



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AEPCO	Sandario 115KV Transmission Line Tap Project	115	Removed	CEC amended - Case # 152	
TEP	Irvington Substation –Tucson Station #2 138kV Line	138	Removed	CEC Not Yet Filed	
TEP	Irvington –Robert Bills –Vail 138kV Line Reconductor	138	Removed	CEC Not Required	
AEPCO	Bicknell Substation 115kV Capacitor Bank Additions	115	Status not provided	CEC Not Required	
AEPCO	Butterfield Substation 115kV Capacitor Bank Additions	115	Status not provided	CEC Not Required	
AEPCO	San Rafael Substation 115kV Capacitor Bank Additions	115	Status not provided	CEC Not Required	
AEPCO	Saguaro Bypass ED5 to Marana Tap	115	Status not provided	CEC Status not provided	



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Exhibit 11
Listing of Queue Interconnection Generation Projects

Queue ¹	Location	MW (Max)	Generation Technology	In-Service Date
APS Active	Moenkopi-Yavapai 500kV Line	161	Wind (101)/PV (60)	Sep 2017
APS Active	Cholla Substation 500kV	200	Wind	Dec 2019
APS Active	Cholla Substation 69kV	75	PV	Jan 2018
APS Active	Delaney Substation 69kV	209.25	PV/Battery Storage	Dec 2018
APS Active	Delaney Substation 500kV	300	PV	Jul 2021
APS Active	El Sol Substation 69kV	50	Battery Storage	Dec 2019
APS Active	Fairview Substation	17.5	PV	Dec 2016
APS Active	Foothills Substation 69kV	70	PV	Jun 2016
APS Active	Gila Bend Substation 230kV	200	PV	Dec 2019
APS Active	Hoodoo Wash Substation 500kV	500	PV	Dec 2018
APS Active	Hoodoo Wash Substation 500kV	200	PV	Dec 2019
APS Active	Hoodoo Wash Substation 500kV	200	PV	Jul 2021
APS Active	Hoodoo Wash Substation 500kV	200	PV	Jul 2021
APS Active	Jojoba Switchyard 230kV	634	Conventional	Mar 2018
APS Active	Jojoba Switchyard 69kV	20	PV	Jun 2017
APS Active	Ocotillo Switchyard 230kV	595	Gas	Nov 2017
APS Active	Saguaro Substation 115kV	44.3	PV	Dec 2016
APS Active	Saguaro Substation 230kV	213.75	PV/Battery Storage	Dec 2018
APS Active	Santa Rosa Substation 230kV	200	PV	Dec 2019
SRP Active	Carlota Substation 115kV	9	PV	Aug 2016
SRP Active	Dinosaur-Hunt 69kV Line	48	PV	Jun 2019
SRP Active	Quail-Florence 69kV Line	50	PV	Aug 2017
SRP Active	Hassayampa Switchyard 500kV	150	PV	Feb 2023
SRP Active	Hassayampa Switchyard 500kV	125	PV	Feb 2023
SRP Active	Hassayampa Switchyard 500kV	338	CC/PV	Jan 2020
TEP Active	Greenlee-Winchester 345kV Line	500	Combined Cycle	Dec 2016
TEP Active	Vail Substation 345kV	206	Gas	Dec 2018
TEP Active	Winchester Substation 345kV	55	PV/Wind	May 2015
Western Active	Mead-Davis 230kV Line	300	Wind	Nov 2006
Western Active	Peacock Substation	425	Wind	Mar 2007
Western Active	Bouse-Gila 161kV Line	110	Solar Thermal	Oct 2008
Western Active	Parker-Blythe 161kV Line	150	Solar Thermal	Nov 2008
Western Active	Mead Substation 230kV	180	PV	Jul 2012
Western Active	Liberty-Meade 345kV Line	300	PV	Aug 2013
Western Active	Blythe Substation 161kV	539	Gas	Aug 2014

¹All generation interconnection queue projects are subject to changes; please refer to the utility's current listing here The above queues reflect the following listing dates: APS 6/20/2016, SRP joint participation 6/15/2016, SRP ANPP 6/13/2016, SRP 5/23/2016, TEP 3/9/2016, WAPA DSW 2/23/2015



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**Exhibit 12
Listing of Projects Sorted by In-Service Date**

BTA Project ID	Description	Participants	Length (mi)	Permitting/Siting Status	Year	kV	Map Exhibit
001	Valencia Substation 115kV Capacitor Bank Additions	AEPCO/SW TC	-	CEC Not Required	2018	115	001
002	Dos Condados Substation 115kV Capacitor Bank Additions	AEPCO/SW TC		CEC Not Required	2018	115	002
008	Bagdad Interconnection Project	AEPCO/SW TC & APS	1	CEC Filed - Case # 179	2018	115	008
009	Mazatzal 345/69kV Substation	APS	0.95	"CEC Approved - Decision #72302"	2018	345	009
010	Ocotillo Modernization Project	APS	1	CEC Approved - Decision #74812	2018	230	010
026	Morgan- Sun Valley 500kV Line	APS, CAWCD	38	CEC Approved – Decision #70850	2018	500	026
028	Browning - Corbell 230 kV Line Reconfiguration	SRP	0.02	CEC Not Required	2018	230	028
029	Rogers - Santan 230kV Line Reconfiguration	SRP	0.01	CEC Not Required	2018	230	029
050	North Loop - Rancho Vistoso 138-kV Line Re-Conductor	TEP	10.5	CEC Not Yet Filed	2018	138	050
051	La Canada - Rillito 138kV Line into Orange Grove 138kV Substation	TEP	Tap off existing line	CEC Not Required	2018	138	051



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003	Valenica - CAP Spreader Yard 115kV Line	AEPCO/SW TC	2.6	CEC Not Yet Filed	2019	115	003
053	Irvington - 22nd Street 138-kV Line Re-Conductor	TEP	4	Case No. 66	2019	138	053
054	Loop-in of Irvington - South 138kV Line into Sonoran 138kV Substation	TEP	Tap off existing line	CEC Not Required	2019	138	054
056	Orange Grove Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2019	138	056
057	Tortolita Substation 138-kV Capacitor Bank #2 Addition	TEP	-	CEC Not Required	2019	138	057
105	Sonoita - Gateway - Valencia 138kV	UNS Electric	4.2	CEC Approved - Case # 176	2019	138	105
106	Re-Conductor WAPA Nogales Tap - Kantor	UNS Electric	30	CEC Approved - Case # 176	2019	138	106
112	Kantor Substation 138-kV Capacitor Bank Additions	UNSE	-	CEC Not Required	2019	138	112
113	Gateway Substation 138-kV Capacitor Bank Additions	UNSE	-	CEC Not Required	2019	138	113
004	Marana - Thornydale - Saguaro Interconnect	AEPCO/SW TC	TBD	CEC Not Yet Filed	2020	115	004
011	Scatter Wash 230/69kV Substation	APS	1	CEC Approved- Case #120 - Decision #65997	2020	230	011



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012	TS4 230/69kV Substation	APS	1	CEC Approved - Decision #73937	2020	230	012
030	Coolidge - Hayden 115kV Reroute	SRP	1.5	CEC Not Yet Filed	2020	115	030
059	Vail - East Loop - Phase 4	TEP	4	Case # 8	2020	138	059
060	Orange Grove - Rillito 138kV Line Re-Conductor	TEP	1.6	CEC Not Required	2020	138	060
061	Rancho Vistoso - La Canada 138kV Line Re-Conductor	TEP	4.4	CEC Not Required	2020	138	061
062	Loop-in of Irvington - Vail 138kV Line into Sonoran 138kV Substation	TEP	Tap off existing line	CEC Not Required	2020	138	062
063	Loop-in of Irvington - Robert Bills 138kV Line into Sonoran 138kV Substation	TEP	Tap off existing line	CEC Not Required	2020	138	063
064	138kV Line from Sonoran to 138 KV Wilmot Energy Center Substation to 138kV South Substation Phase #1	TEP	4	CEC Not Yet Filed	2020	138	064
065	La Canada - Orange Grove 138kV Line Re-Conductor	TEP	Tap off existing line	CEC Not Yet Filed	2020	138	065
067	Irvin Iton Substation 138-kV Capacitor Bank #3 Addition	TEP	-	CEC Not Required	2020	138	067



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068	Pantano Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2020	138	068
069	22nd Street Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2020	138	069
005	Tombstone Junction	AEPCO/SW TC	TBD	CEC Not Yet Filed	2021	230	005
013	North Gila - Orchard 230kV Line	APS	13	CEC Approved – Case #163 – Decision #72801	2021	230	013
031	Price Road Corridor - Knox - Henshaw 230kV Line	SRP	7	CEC Approved - Case #175 - Decision #76371	2021	230	031
032	Abel- Pfister - Ball 230kV	SRP	20	CEC Approved - Case #148 - Decision #71441	2021	230	032
049	SunZia Southwest Transmission 500kV Project	SWPG, SRP, TEP, Shell, TSGT	200	CEC Approved - Case #171 - Decision #75464	2021	500	049
070	Irvington Substation - Kino 138kV Substation	TEP	6	CEC Not Yet Filed	2021	138	070
071	Irvington -Tucson 138kV Line #2 Loop-in with Kino	TEP	10.9	CEC Not Yet Filed	2021	138	071
072	Drexel Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2021	138	072
073	West Ina Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2021	138	073



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074	Tortolita Substation 138-kV Capacitor Bank #3 Addition	TEP	-	CEC Not Required	2021	138	074
075	138kV Line from Sonoran to 138 KV Wilmot Energy Center Substation to 138kV South Substation Phase #2	TEP	12	CEC Not Yet Filed	2022	138	075
076	Tortolita - North Loop 138kV Line Re-Conductor	TEP	14.3	CEC Not Yet Filed	2022	138	076
077	Hartt Loop-in on Toro - Green Valley (South - Green Valley) 138kV Line	TEP	Tap off existing line	CEC Not Yet Filed	2022	138	077
078	Tortolita Substation 138-kV Capacitor Bank #4 Addition	TEP	-	CEC Not Required	2022	138	078
079	North Loop Substation 138-kV Capacitor Bank #3 Addition	TEP	-	CEC Not Required	2022	138	079
080	DeMoss Petrie Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2022	138	080
033	Copper Crossing - Abel 230 kV	SRP	1	CEC Not Yet Filed	2023	230	033
081	Northeast - Synder 138kV into Craycroft - Barril 138kV Substation	TEP	Tap off existing line	CEC Not Required	2023	138	081
034	Southeast Power Link	SRP	TBD	CEC Not Yet Filed	2024	230	034



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035	Hassayampa - Pinal West 500kV #2 Line	SRP	51	CEC Approved - Case #124 - Decision #67012	2024	500	035
083	Interconnection of Tortolita - North Loop #5 with TEP Marana 138kV Substation	TEP	4	CEC Not Yet Filed	2024	138	083
084	139kV Line from North Loop Substation to El Camino Del Cerro Substation	TEP	14.3	CEC Not Yet Filed	2024	138	084
086	North Loop Substation 138-kV Capacitor Bank #4 Addition	TEP	-	CEC Not Required	2024	138	086
087	Interconnection of North Loop - Rancho Vistoso 138-kV Line with future Naranja 138-kV Substation	TEP	1	CEC Not Yet Filed	2025	138	087
088	Naranja Substation 138-kV Capacitor Banks #1 & #2 Addition	TEP	-	CEC Not Required	2025	138	088
036	Silver King- New Oak Flat - New Superior 230kV	SRP	6.5	CEC Not Yet Filed	2026	230	036
089	Del Cerro - Tucson 138-kV Line Re-Conductor	TEP	6.75	CEC Not Required	2026	138	089
090	Interconnection of Irvington - South Loop 138-kV Line to future Corono 138-kV Substation	TEP	1	CEC Not Yet Filed	2026	138	090



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037	Superior - Silver King 115kV Re-route	SRP	1	CEC Approved - Case #166 - Decisions #73551, #76594	2027	115	037
052	Reconfiguration of Tortolita - Ranch Vistoso 138kV to North Loop - Rancho Vistoso 138kV	TEP	22	CEC Not Yet Filed	2018	138	052
055	Toro - Rosemont 138kV Line	TEP	13.2	Case # 164 Dependent upon approval of Mine Record of Decision from United States Forestry Service	2019	138	055
058	Hassayampa - Pinal West 500kV Line Loop- in to Jojoba	TEP	less than 3 spans	Case # 124	2020	500	058
066	Harrison Loop-in of Roberts - East Loop 138kV Line	TEP	4	CEC Approved - Case # 8	2020	138	066
082	Craycroft-Barrill Loop- in of Northeast - Snyder 138kV Line	TEP	Tap off existin g line	CEC Not Yet Filed	2023	138	082
085	Marina Loop-in on one Tortolita - North Loop 138kV Circuit	TEP	4	CEC Not Yet Filed	2024	138	085
006	Apache/Hayden - San Manuel 115kV Line	AEPCO/SW TC	4.5	CEC Approved - Case # 142	TBD	115	006
007	Saguaro to Tucson 115 kV Line Loop-in To Marina	AEPCO/SW TC	TBD	CEC Not Yet Filed	TBD	115	007



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014	Morgan - Sun Valley 230kV Line	APS	38	CEC Approved – Decision #70850	TBD	230	014
015	EI Sol- Westwing 230kV Line	APS	11	CEC Approved – Docket #U-1345	TBD	230	015
016	Palm Valley - TS2- Trilby Wash 230kV Line # 2	APS	12	CEC Approved – Decision #67828	TBD	230	016
017	Avery 230/69kV Substation	APS	1	CEC Approved - Case #120 - Decision #65997 Amended 4/10/2013 Decision #73824	TBD	230	017
018	Orchard - Yucca 230kV Line	APS	19	CEC Approved – Case #163 – Decision #72801	TBD	230	018
019	Sun Valley - TS10 - TS11 230kV Line	APS	TBD	CEC Not Yet Filed	TBD	230	019
020	Buckeye - TSII- Sun Valley 230kV Line	APS	TBD	CEC Not Yet Filed	TBD	230	020
021	Komatke 230/69kV Substation	APS	TBD	CEC Approved - Decision #62960	TBD	230	021
022	TS2 230/69kV Substation	APS	TBD	CEC Approved - Decision #73937	TBD	230	022
023	Sun Valley - Trilby Wash 230kV Line Circuit #2	APS	TBD	CEC Approved - Decision #67828	TBD	230	023
024	Bagdad 115kV/69kV Back-Up	APS	TBD	CEC Not Yet Filed	TBD	115	024
025	Palo Verde - Saguaro 500kV Line	APS, CATS	130	CEC Approved - Case #24 - Decision #46802	TBD	500	025



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027	Pinal Central- Sundance 230kV Line	APS, ED2	6	CEC Approved – Case #136 – Decision #70325	TBD	230	027
038	Eastern Mining Expansion	SRP	TBD	CEC Not Yet Filed	TBD		038
039	Superior 230kV Loop-in	SRP	TBD	CEC Not Yet Filed	TBD	230	039
040	Thunderstone - Browning 230kV	SRP	TBD	CEC Not Yet Filed	TBD	230	040
041	Silver King - Knoll - New Hayden 230kV	SRP	TBD	CEC Not Yet Filed	TBD	230	041
042	New Hayden 115kV Loop-in	SRP	TBD	CEC Not Yet Filed	TBD	115	042
043	RS25 Project	SRP	TBD	CEC Not Yet Filed	TBD		043
044	RS26 Project	SRP	TBD	CEC Not Yet Filed	TBD		044
045	Pinal Central - Abel - RS-20 500kV	SRP	TBD	CEC Not Yet Filed	TBD	500	045
046	Palo Verde - Saguaro 500kV	SRP	TBD	CEC Not Yet Filed	TBD	500	046
047	Ball (RS17) 230kV Loop-in	SRP	TBD	CEC Not Yet Filed	TBD	230	047
048	Pinnacle Peak - Brandow 230kV	SRP	TBD	CEC Not Yet Filed	TBD	230	048
091	Saguaro Substation - Winchester Substation	TEP	80	Decision No. 46801	TBD	500	091
092	Gila River - Pinal West 500-kV	TEP	50	CEC Not Yet Filed	TBD	500	092
093	Vail Substation - Irvington Substation	TEP	11	CEC Not Yet Filed	TBD	345	093



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094	Irvington Substation - South Substation	TEP	16	CEC Not Yet Filed	TBD	345	094
095	Vail Substation to South Substation - 2nd Circuit	TEP	14	Case # 15	TBD	345	095
096	Springerville Substation - Greenlee Substation - 2nd Circuit	TEP	27	Case # 12, 30, 63 and 73	TBD	345	096
097	Tortolita Substation - South Substation	TEP	68	Case # 50	TBD	345	097
098	Westwing Substation - South Substation - 2nd Circuit	TEP	178	Case # 15	TBD	345	098
099	Irvington - Vail 138-kV Line Re-Conductor	TEP	11	CEC Not Required	TBD	138	099
100	Irvington - RobertBills - Vail 138-kV Line Re-Conductor	TEP	14	CEC Not Required	TBD	138	100
101	Irvington - South 138-kV Line Re-Conductor	TEP	18	CEC Not Required	TBD	138	101
102	Irvington - Drexel - Midvale - South 138-kV Line Re-Conductor	TEP	18	CEC Not Required	TBD	138	102
103	Vail - East Loop - Phase 3 Line #3 138kV	TEP	22	CEC Approved - Case # 8	TBD	138	103
104	Irvington - East Loop Project - Phase 3 (Irvington - 22nd Street #2 Line)	TEP	9	CEC Approved - Case # 66	TBD	138	104
107	Griffith - North Havasu 230kV Line	UNS Electric	40	CEC Approved - Case # 88	TBD	230	107



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108	Golden Valley 230kV Line	UNS Electric	17	CEC Not Yet Filed	TBD	230	108
109	Vail to Gateway 138-kV Transmission Line, 2nd Circuit	UNS Electric	60	CEC Approved - Case # 176	TBD	138	109
110	Gateway to Valenica 138kV	UNS Electric	4.2	CEC Approved - Case # 176	TBD	138	110
111	230kv Line from Gateway Substation to US/Mexico Border	UNS Electric	2	CEC Approved - Case # 176	TBD	230	111

**Exhibit 13
Listing of Projects Sorted by Voltage**

BTA Project ID	Description	Participants	Length (mi)	Permitting/Siting Status	Year	kV	Map Exhibit
001	Valencia Substation 115kV Capacitor Bank Additions	AEPCO/SWT C	-	CEC Not Required	2018	115	001
002	Dos Condados Substation 115kV Capacitor Bank Additions	AEPCO/SWT C		CEC Not Required	2018	115	002
008	Bagdad Interconnection Project	AEPCO/SWT C & APS	1	CEC Filed - Case # 179	2018	115	008
003	Valenica - CAP Spreader Yard 115kV Line	AEPCO/SWT C	2.6	CEC Not Yet Filed	2019	115	003
004	Marana - Thornydale - Saguaro Interconnect	AEPCO/SWT C	TBD	CEC Not Yet Filed	2020	115	004



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030	Coolidge - Hayden 115kV Reroute	SRP	1.5	CEC Not Yet Filed	2020	115	030
037	Superior - Silver King 115kV Re-route	SRP	1	CEC Approved - Case #166 - Decisions #73551, #76594	2027	115	037
006	Apache/Hayden - San Manuel 115kV Line	AEPCO/SWT C	4.5	CEC Approved - Case # 142	TBD	115	006
007	Saguaro to Tucson 115 kV Line Loop-in To Marina	AEPCO/SWT C	TBD	CEC Not Yet Filed	TBD	115	007
024	Bagdad 115kV/69kV Back-Up	APS	TBD	CEC Not Yet Filed	TBD	115	024
042	New Hayden 115kV Loop-in	SRP	TBD	CEC Not Yet Filed	TBD	115	042
050	North Loop - Rancho Vistoso 138-kV Line Re-Conductor	TEP	10.5	CEC Not Yet Filed	2018	138	050
051	La Canada - Rillito 138kV Line into Orange Grove 138kV Substation	TEP	Tap off existing line	CEC Not Required	2018	138	051
053	Irvington - 22nd Street 138-kV Line Re- Conductor	TEP	4	Case No. 66	2019	138	053
054	Loop-in of Irvington - South 138kV Line into Sonoran 138kV Substation	TEP	Tap off existing line	CEC Not Required	2019	138	054



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056	Orange Grove Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2019	138	056
057	Tortolita Substation 138-kV Capacitor Bank #2 Addition	TEP	-	CEC Not Required	2019	138	057
105	Sonoita - Gateway - Valencia 138kV	UNS Electric	4.2	CEC Approved - Case # 176	2019	138	105
106	Re-Conductor WAPA Nogales Tap - Kantor	UNS Electric	30	CEC Approved - Case # 176	2019	138	106
112	Kantor Substation 138-kV Capacitor Bank Additions	UNSE	-	CEC Not Required	2019	138	112
113	Gateway Substation 138-kV Capacitor Bank Additions	UNSE	-	CEC Not Required	2019	138	113
059	Vail - East Loop - Phase 4	TEP	4	Case # 8	2020	138	059
060	Orange Grove - Rillito 138kV Line Re-Conductor	TEP	1.6	CEC Not Required	2020	138	060
061	Rancho Vistoso - La Canada 138kV Line Re-Conductor	TEP	4.4	CEC Not Required	2020	138	061
062	Loop-in of Irvington - Vail 138kV Line into Sonoran 138kV Substation	TEP	Tap off existing line	CEC Not Required	2020	138	062



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063	Loop-in of Irvington - Robert Bills 138kV Line into Sonoran 138kV Substation	TEP	Tap off existing line	CEC Not Required	2020	138	063
064	138kV Line from Sonoran to 138 KV Wilmot Energy Center Substation to 138kV South Substation Phase #1	TEP	4	CEC Not Yet Filed	2020	138	064
065	La Canada - Orange Grove 138kV Line Re-Conductor	TEP	Tap off existing line	CEC Not Yet Filed	2020	138	065
067	Irvin Iton Substation 138-kV Capacitor Bank #3 Addition	TEP	-	CEC Not Required	2020	138	067
068	Pantano Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2020	138	068
069	22nd Street Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2020	138	069
070	Irvington Substation - Kino 138kV Substation	TEP	6	CEC Not Yet Filed	2021	138	070
071	Irvington -Tucson 138kV Line #2 Loop-in with Kino	TEP	10.9	CEC Not Yet Filed	2021	138	071
072	Drexel Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2021	138	072



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073	West Ina Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2021	138	073
074	Tortolita Substation 138-kV Capacitor Bank #3 Addition	TEP	-	CEC Not Required	2021	138	074
075	138kV Line from Sonoran to 138 KV Wilmot Energy Center Substation to 138kV South Substation Phase #2	TEP	12	CEC Not Yet Filed	2022	138	075
076	Tortolita - North Loop 138kV Line Re- Conductor	TEP	14.3	CEC Not Yet Filed	2022	138	076
077	Hartt Loop-in on Toro - Green Valley (South - Green Valley) 138kV Line	TEP	Tap off existing line	CEC Not Yet Filed	2022	138	077
078	Tortolita Substation 138-kV Capacitor Bank #4 Addition	TEP	-	CEC Not Required	2022	138	078
079	North Loop Substation 138-kV Capacitor Bank #3 Addition	TEP	-	CEC Not Required	2022	138	079
080	DeMoss Petrie Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2022	138	080
081	Northeast - Synder 138kV into Craycroft - Barril 138kV Substation	TEP	Tap off existing line	CEC Not Required	2023	138	081



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083	Interconnection of Tortolita - North Loop #5 with TEP Marana 138kV Substation	TEP	4	CEC Not Yet Filed	2024	138	083
084	139kV Line from North Loop Substation to El Camino Del Cerro Substation	TEP	14.3	CEC Not Yet Filed	2024	138	084
086	North Loop Substation 138-kV Capacitor Bank #4 Addition	TEP	-	CEC Not Required	2024	138	086
087	Interconnection of North Loop - Rancho Vistoso 138-kV Line with future Naranja 138-kV Substation	TEP	1	CEC Not Yet Filed	2025	138	087
088	Naranja Substation 138-kV Capacitor Banks #1 & #2 Addition	TEP	-	CEC Not Required	2025	138	088
089	Del Cerro - Tucson 138-kV Line Re-Conductor	TEP	6.75	CEC Not Required	2026	138	089
090	Interconnection of Irvington - South Loop 138-kV Line to future Corono 138-kV Substation	TEP	1	CEC Not Yet Filed	2026	138	090
052	Reconfiguration of Tortolita - Ranch Vistoso 138kV to North Loop - Rancho Vistoso 138kV	TEP	22	CEC Not Yet Filed	2018	138	052



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055	Toro - Rosemont 138kV Line	TEP	13.2	Case # 164 Dependent upon approval of Mine Record of Decision from United States Forestry Service	2019	138	055
066	Harrison Loop-in of Roberts - East Loop 138kV Line	TEP	4	CEC Approved - Case # 8	2020	138	066
082	Craycroft-Barrill Loop- in of Northeast - Snyder 138kV Line	TEP	Tap off existing line	CEC Not Yet Filed	2023	138	082
085	Marina Loop-in on one Tortolita - North Loop 138kV Circuit	TEP	4	CEC Not Yet Filed	2024	138	085
099	Irvington - Vail 138-kV Line Re-Conductor	TEP	11	CEC Not Required	TBD	138	099
100	Irvington - RobertBills - Vail 138-kV Line Re- Conductor	TEP	14	CEC Not Required	TBD	138	100
101	Irvington - South 138- kV Line Re-Conductor	TEP	18	CEC Not Required	TBD	138	101
102	Irvington - Drexel - Midvale - South 138-kV Line Re-Conductor	TEP	18	CEC Not Required	TBD	138	102
103	Vail - East Loop - Phase 3 Line #3 138kV	TEP	22	CEC Approved - Case # 8	TBD	138	103
104	Irvington - East Loop Project - Phase 3 (Irvington - 22nd Street #2 Line)	TEP	9	CEC Approved - Case # 66	TBD	138	104



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109	Vail to Gateway 138-kV Transmission Line, 2nd Circuit	UNS Electric	60	CEC Approved - Case # 176	TBD	138	109
110	Gateway to Valenica 138kV	UNS Electric	4.2	CEC Approved - Case # 176	TBD	138	110
010	Ocotillo Modernization Project	APS	1	CEC Approved - Decision #74812	2018	230	010
028	Browning - Corbell 230 kV Line Reconfiguration	SRP	0.02	CEC Not Required	2018	230	028
029	Rogers - Santan 230kV Line Reconfiguration	SRP	0.01	CEC Not Required	2018	230	029
011	Scatter Wash 230/69kV Substation	APS	1	CEC Approved- Case #120 - Decision #65997	2020	230	011
012	TS4 230/69kV Substation	APS	1	CEC Approved - Decision #73937	2020	230	012
005	Tombstone Junction	AEPCO/SWT C	TBD	CEC Not Yet Filed	2021	230	005
013	North Gila - Orchard 230kV Line	APS	13	CEC Approved – Case #163 – Decision #72801	2021	230	013
031	Price Road Corridor - Knox - Henshaw 230kV Line	SRP	7	CEC Approved - Case #175 - Decision #76371	2021	230	031
032	Abel- Pfister - Ball 230kV	SRP	20	CEC Approved - Case #148 - Decision #71441	2021	230	032
033	Copper Crossing - Abel 230 kV	SRP	1	CEC Not Yet Filed	2023	230	033



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034	Southeast Power Link	SRP	TBD	CEC Not Yet Filed	2024	230	034
036	Silver King- New Oak Flat - New Superior 230kV	SRP	6.5	CEC Not Yet Filed	2026	230	036
014	Morgan - Sun Valley 230kV Line	APS	38	CEC Approved – Decision #70850	TBD	230	014
015	EI Sol- Westwing 230kV Line	APS	11	CEC Approved – Docket #U-1345	TBD	230	015
016	Palm Valley - TS2- Trilby Wash 230kV Line # 2	APS	12	CEC Approved – Decision #67828	TBD	230	016
017	Avery 230/69kV Substation	APS	1	CEC Approved - Case #120 - Decision #65997 Amended 4/10/2013 Decision #73824	TBD	230	017
018	Orchard - Yucca 230kV Line	APS	19	CEC Approved – Case #163 – Decision #72801	TBD	230	018
019	Sun Valley - TS10 - TS11 230kV Line	APS	TBD	CEC Not Yet Filed	TBD	230	019
020	Buckeye - TSII- Sun Valley 230kV Line	APS	TBD	CEC Not Yet Filed	TBD	230	020
021	Komatke 230/69kV Substation	APS	TBD	CEC Approved - Decision #62960	TBD	230	021
022	TS2 230/69kV Substation	APS	TBD	CEC Approved - Decision #73937	TBD	230	022
023	Sun Valley - Trilby Wash 230kV Line Circuit #2	APS	TBD	CEC Approved - Decision #67828	TBD	230	023



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027	Pinal Central- Sundance 230kV Line	APS, ED2	6	CEC Approved – Case #136 – Decision #70325	TBD	230	027
039	Superior 230kV Loop-in	SRP	TBD	CEC Not Yet Filed	TBD	230	039
040	Thunderstone - Browning 230kV	SRP	TBD	CEC Not Yet Filed	TBD	230	040
041	Silver King - Knoll - New Hayden 230kV	SRP	TBD	CEC Not Yet Filed	TBD	230	041
047	Ball (RS17) 230kV Loop-in	SRP	TBD	CEC Not Yet Filed	TBD	230	047
048	Pinnacle Peak - Brandow 230kV	SRP	TBD	CEC Not Yet Filed	TBD	230	048
107	Griffith - North Havasu 230kV Line	UNS Electric	40	CEC Approved - Case # 88	TBD	230	107
108	Golden Valley 230kV Line	UNS Electric	17	CEC Not Yet Filed	TBD	230	108
111	230kv Line from Gateway Substation to US/Mexico Border	UNS Electric	2	CEC Approved - Case # 176	TBD	230	111
009	Mazatzal345/69kV Substation	APS	0.95	"CEC Approved - Decision #72302"	2018	345	009
093	Vail Substation - Irvington Substation	TEP	11	CEC Not Yet Filed	TBD	345	093
094	Irvington Substation - South Substation	TEP	16	CEC Not Yet Filed	TBD	345	094
095	Vail Substation to South Substation - 2nd Circuit	TEP	14	Case # 15	TBD	345	095



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096	Springerville Substation - Greenlee Substation - 2nd Circuit	TEP	27	Case # 12, 30, 63 and 73	TBD	345	096
097	Tortolita Substation - South Substation	TEP	68	Case # 50	TBD	345	097
098	Westwing Substation - South Substation - 2nd Circuit	TEP	178	Case # 15	TBD	345	098
026	Morgan- Sun Valley 500kV Line	APS, CAWCD	38	CEC Approved – Decision #70850	2018	500	026
049	SunZia Southwest Transmission 500kV Project	SWPG, SRP, TEP, Shell, TSGT	200	CEC Approved - Case #171 - Decision #75464	2021	500	049
035	Hassayampa - Pinal West 500kV #2 Line	SRP	51	CEC Approved - Case #124 - Decision #67012	2024	500	035
058	Hassayampa - Pinal West 500kV Line Loop-in to Jojoba	TEP	less than 3 spans	Case # 124	2020	500	058
025	Palo Verde - Saguaro 500kV Line	APS, CATS	130	CEC Approved - Case #24 - Decision #46802	TBD	500	025
045	Pinal Central - Abel - RS-20 500kV	SRP	TBD	CEC Not Yet Filed	TBD	500	045
046	Palo Verde - Saguaro 500kV	SRP	TBD	CEC Not Yet Filed	TBD	500	046
091	Saguaro Substation - Winchester Substation	TEP	80	Decision No. 46801	TBD	500	091
092	Gila River - Pinal West 500-kV	TEP	50	CEC Not Yet Filed	TBD	500	092



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038	Eastern Mining Expansion	SRP	TBD	CEC Not Yet Filed	TBD		038
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Exhibit 14
Arizona Public Service Project Summary

Description	Participants	Length (mi)	Permitting/Siting Status	Year	kV
Mazatzal 345/69kV Substation	APS	0.95	CEC Approved - Decision #72302	2018	345
Ocotillo Modernization Project	APS	1	CEC Approved - Decision #74812	2018	230
Scatter Wash 230/69kV Substation	APS	1	CEC Approved- Case #120 - Decision #65997	2020	230
TS4 230/69kV Substation	APS	1	CEC Approved - Decision #73937	2020	230
North Gila - Orchard 230kV Line	APS	13	CEC Approved – Case #163 – Decision #72801	2021	230
Morgan - Sun Valley 230kV Line	APS	38	CEC Approved – Decision #70850	TBD	230
EI Sol- Westwing 230kV Line	APS	11	CEC Approved – Docket #U-1345	TBD	230
Palm Valley - TS2- Trilby Wash 230kV Line # 2	APS	12	CEC Approved – Decision #67828	TBD	230
Avery 230/69kV Substation	APS	1	CEC Approved - Case #120 - Decision #65997 Amended 4/10/2013 Decision #73824	TBD	230
Orchard - Yucca 230kV Line	APS	19	CEC Approved – Case #163 – Decision #72801	TBD	230
Sun Valley - TS10 - TS11 230kV Line	APS	TBD	CEC Not Yet Filed	TBD	230
Buckeye - TSII- Sun Valley 230kV Line	APS	TBD	CEC Not Yet Filed	TBD	230
Komatke 230/69kV Substation	APS	TBD	CEC Approved - Decision #62960	TBD	230
TS2 230/69kV Substation	APS	TBD	CEC Approved - Decision #73937	TBD	230
Sun Valley - Trilby Wash 230kV Line Circuit #2	APS	TBD	CEC Approved - Decision #67828	TBD	230
Bagdad 115/69kV Back-Up	APS	TBD	CEC Not Yet Filed	TBD	115
Palo Verde - Saguaro 500kV Line	APS, CATS	130	CEC Approved - Case #24 - Decision #46802	TBD	500
Morgan- Sun Valley 500kV Line	APS, CAWCD	38	CEC Approved – Decision #70850	2018	500



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Pinal Central-Sundance 230kV Line	APS, ED2	6	CEC Approved – Case #136 – Decision #70325	TBD	230
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**Exhibit 15
Salt River Project Summary**

Description	Participants	Length (mi)	Permitting/Siting Status	Year	kV
Browning - Corbell 230 kV Line Reconfiguration	SRP	0.02	CEC Not Required	2018	230
Rogers - Santan 230kV Line Reconfiguration	SRP	0.01	CEC Not Required	2018	230
Coolidge - Hayden 115kV Reroute	SRP	1.5	CEC Not Yet Filed	2020	115
Price Road Corridor -Knox - Henshaw 230kV Line	SRP	7	CEC Approved - Case #175 - Decision #76371	2021	230
Abel- Pfister - Ball 230kV	SRP	20	CEC Approved - Case #148 - Decision #71441	2021	230
Copper Crossing - Abel 230 kV	SRP	1	CEC Not Yet Filed	2023	230
Southeast Power Link	SRP	TBD	CEC Not Yet Filed	2024	230
Hassayampa - Pinal West 500kV #2 Line	SRP	51	CEC Approved - Case #124 - Decision #67012	2024	500
Silver King- New Oak Flat - New Superior 230kV	SRP	6.5	CEC Not Yet Filed	2026	230
Superior - Silver King 115kV Re-route	SRP	1	CEC Approved - Case #166 - Decisions #73551, #76594	2027	115
Eastern Mining Expansion	SRP	TBD	CEC Not Yet Filed	TBD	
Superior 230kV Loop-in	SRP	TBD	CEC Not Yet Filed	TBD	230
Thunderstone - Browning 230kV	SRP	TBD	CEC Not Yet Filed	TBD	230
Silver King - Knoll - New Hayden 230kV	SRP	TBD	CEC Not Yet Filed	TBD	230
New Hayden 115kV Loop-in	SRP	TBD	CEC Not Yet Filed	TBD	115
RS25 Project	SRP	TBD	CEC Not Yet Filed	TBD	
RS26 Project	SRP	TBD	CEC Not Yet Filed	TBD	
Pinal Central - Abel - RS-20 500kV	SRP	TBD	CEC Not Yet Filed	TBD	500
Palo Verde - Saguaro 500kV	SRP	TBD	CEC Not Yet Filed	TBD	500
Ball (RS17) 230kV Loop-in	SRP	TBD	CEC Not Yet Filed	TBD	230
Pinnacle Peak - Brandow 230kV	SRP	TBD	CEC Not Yet Filed	TBD	230



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SunZia Southwest Transmission 500kV Project	SWPG, SRP, TEP, Shell, TSGT	200	CEC Approved - Case #171 - Decision #75464	2021	500
Exhibit 16					
AEPCO / Arizona G&T Cooperatives Project Summary					
Description	Participants	Length (mi)	Permitting/Siting Status	Year	kV
Valencia Substation 115kV Capacitor Bank Additions	AEPCO/SW TC	-	CEC Not Required	2018	115
Dos Condados Substation 115kV Capacitor Bank Additions	AEPCO/SW TC		CEC Not Required	2018	115
Valencia - CAP Spreader Yard 115kV Line	AEPCO/SW TC	2.6	CEC Not Yet Filed	2019	115
Marana - Thornydale - Saguaro Interconnect	AEPCO/SW TC	TBD	CEC Not Yet Filed	2020	115
Tombstone Junction	AEPCO/SW TC	TBD	CEC Not Yet Filed	2021	230
Apache/Hayden - San Manuel 115kV Line	AEPCO/SW TC	4.5	CEC Approved - Case # 142	TBD	115
Saguaro to Tucson 115 kV Line Loop-in To Marina	AEPCO/SW TC	TBD	CEC Not Yet Filed	TBD	115
Bagdad Interconnection Project	AEPCO/SW TC & APS	1	CEC Filed - Case # 179	2018	115



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Exhibit 17
Tucson Electric Power Project Summary

Description	Participants	Length (mi)	Permitting/Siting Status	Year	kV
North Loop - Rancho Vistoso 138-kV Line Re-Conductor	TEP	10.5	CEC Not Yet Filed	2018	138
La Canada - Rillito 138kV Line into Orange Grove 138kV Substation	TEP	Tap off existing line	CEC Not Required	2018	138
Reconfiguration of Tortolita - Ranch Vistoso 138kV to North Loop - Rancho Vistoso 138kV	TEP	22	CEC Not Yet Filed	2018	138
Irvington - 22nd Street 138-kV Line Re-Conductor	TEP	4	Case No. 66	2019	138
Loop-in of Irvington - South 138kV Line into Sonoran 138kV Substation	TEP	Tap off existing line	CEC Not Required	2019	138
Toro - Rosemont 138kV Line	TEP	13.2	Case # 164 Dependent upon approval of Mine Record of Decision from United States Forestry Service	2019	138
Orange Grove Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2019	138
Tortolita Substation 138-kV Capacitor Bank #2 Addition	TEP	-	CEC Not Required	2019	138
Hassayampa - Pinal West 500kV Line Loop-in to Jojoba	TEP	less than 3 spans	Case # 124	2020	500
Vail - East Loop - Phase 4	TEP	4	Case # 8	2020	138
Orange Grove - Rillito 138kV Line Re-Conductor	TEP	1.6	CEC Not Required	2020	138
Rancho Vistoso - La Canada 138kV Line Re-Conductor	TEP	4.4	CEC Not Required	2020	138
Loop-in of Irvington - Vail 138kV Line into Sonoran 138kV Substation	TEP	Tap off existing line	CEC Not Required	2020	138



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Loop-in of Irvington - Robert Bills 138kV Line into Sonoran 138kV Substation	TEP	Tap off existing line	CEC Not Required	2020	138
138kV Line from Sonoran to 138 KV Wilmot Energy Center Substation to 138kV South Substation Phase #1	TEP	4	CEC Not Yet Filed	2020	138
La Canada - Orange Grove 138kV Line Re-Conductor	TEP	Tap off existing line	CEC Not Yet Filed	2020	138
Harrison Loop-in of Roberts - East Loop 138kV Line	TEP	4	CEC Approved - Case # 8	2020	138
Irvin Iton Substation 138-kV Capacitor Bank #3 Addition	TEP	-	CEC Not Required	2020	138
Pantano Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2020	138
22nd Street Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2020	138
Irvington Substation - Kino 138kV Substation	TEP	6	CEC Not Yet Filed	2021	138
Irvington -Tucson 138kV Line #2 Loop-in with Kino	TEP	10.9	CEC Not Yet Filed	2021	138
Drexel Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2021	138
West Ina Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2021	138
Tortolita Substation 138-kV Capacitor Bank #3 Addition	TEP	-	CEC Not Required	2021	138
138kV Line from Sonoran to 138 KV Wilmot Energy Center Substation to 138kV South Substation Phase #2	TEP	12	CEC Not Yet Filed	2022	138
Tortolita - North Loop 138kV Line Re-Conductor	TEP	14.3	CEC Not Yet Filed	2022	138



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Hartt Loop-in on Toro - Green Valley (South - Green Valley) 138kV Line	TEP	Tap off existing line	CEC Not Yet Filed	2022	138
Tortolita Substation 138-kV Capacitor Bank #4 Addition	TEP	-	CEC Not Required	2022	138
North Loop Substation 138-kV Capacitor Bank #3 Addition	TEP	-	CEC Not Required	2022	138
DeMoss Petrie Substation 138-kV Capacitor Bank #1 Addition	TEP	-	CEC Not Required	2022	138
Northeast - Synder 138kV into Craycroft - Barril 138kV Substation	TEP	Tap off existing line	CEC Not Required	2023	138
Craycroft-Barrill Loop-in of Northeast - Snyder 138kV Line	TEP	Tap off existing line	CEC Not Yet Filed	2023	138
Interconnection of Tortolita - North Loop #5 with TEP Marana 138kV Substation	TEP	4	CEC Not Yet Filed	2024	138
139kV Line from North Loop Substation to El Camino Del Cerro Substation	TEP	14.3	CEC Not Yet Filed	2024	138
Marina Loop-in on one Tortolita - North Loop 138kV Circuit	TEP	4	CEC Not Yet Filed	2024	138
North Loop Substation 138-kV Capacitor Bank #4 Addition	TEP	-	CEC Not Required	2024	138
Interconnection of North Loop - Rancho Vistoso 138-kV Line with future Naranja 138-kV Substation	TEP	1	CEC Not Yet Filed	2025	138
Naranja Substation 138-kV Capacitor Banks #1 & #2 Addition	TEP	-	CEC Not Required	2025	138
Del Cerro - Tucson 138-kV Line Re-Conductor	TEP	6.75	CEC Not Required	2026	138
Interconnection of Irvington - South Loop 138-kV Line to future Coronado 138-kV Substation	TEP	1	CEC Not Yet Filed	2026	138



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Saguaro Substation - Winchester Substation	TEP	80	Decision No. 46801	TBD	500
Gila River - Pinal West 500-kV	TEP	50	CEC Not Yet Filed	TBD	500
Vail Substation - Irvington Substation	TEP	11	CEC Not Yet Filed	TBD	345
Irvington Substation - South Substation	TEP	16	CEC Not Yet Filed	TBD	345
Vail Substation to South Substation - 2nd Circuit	TEP	14	Case # 15	TBD	345
Springerville Substation - Greenlee Substation - 2nd Circuit	TEP	27	Case # 12, 30, 63 and 73	TBD	345
Tortolita Substation - South Substation	TEP	68	Case # 50	TBD	345
Westwing Substation - South Substation - 2nd Circuit	TEP	178	Case # 15	TBD	345
Irvington - Vail 138-kV Line Re-Conductor	TEP	11	CEC Not Required	TBD	138
Irvington - RobertBills - Vail 138-kV Line Re-Conductor	TEP	14	CEC Not Required	TBD	138
Irvington - South 138-kV Line Re-Conductor	TEP	18	CEC Not Required	TBD	138
Irvington - Drexel - Midvale - South 138-kV Line Re-Conductor	TEP	18	CEC Not Required	TBD	138
Vail - East Loop - Phase 3 Line #3 138kV	TEP	22	CEC Approved - Case # 8	TBD	138
Irvington - East Loop Project - Phase 3 (Irvington - 22nd Street #2 Line)	TEP	9	CEC Approved - Case # 66	TBD	138



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**Exhibit 18
Unisource Electric Project Summary**

Description	Participants	Length (mi)	Permitting/Siting Status	Year	kV
Sonoita - Gateway - Valencia 138kV	UNS Electric	4.2	CEC Approved - Case # 176	2019	138
Re-Conductor WAPA Nogales Tap - Kantor	UNS Electric	30	CEC Approved - Case # 176	2019	138
Griffith - North Havasu 230kV Line	UNS Electric	40	CEC Approved - Case # 88	TBD	230
Golden Valley 230kV Line	UNS Electric	17	CEC Not Yet Filed	TBD	230
Vail to Gateway 138-kV Transmission Line, 2nd Circuit	UNS Electric	60	CEC Approved - Case # 176	TBD	138
Gateway to Valenica 138kV	UNS Electric	4.2	CEC Approved - Case # 176	TBD	138
230kv Line from Gateway Substation to US/Mexico Border	UNS Electric	2	CEC Approved - Case # 176	TBD	230
Kantor Substation 138-kV Capacitor Bank Additions	UNS Electric	-	CEC Not Required	2019	138
Gateway Substation 138-kV Capacitor Bank Additions	UNS Electric	-	CEC Not Required	2019	138



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Exhibit 19					
Other Transmission and Generation Project Summary by In-Service Date					
Description	Participants	Length (mi)	Permitting/Siting Status	Year	kV
Mohave County 500 MW Wind Farm	Mohave County Wind Farm	6	CEC Approved - Decision #73584	2018	500
Pinal Central Energy Center Gen-Tie Project	NextEra Energy, SRP	0.5	CEC Approved - Case #174	2018	230
Southline Transmission Project	Southline Transmission LLC	246	CEC Approved - Case #173	2018	345
Bowie 1,000MW Power Station	Southwestern Power Group, TEP	15	CEC Approved - Decision #70588 Amendments #69339, #71951	2020	345
Crossroads Solar Energy 150MW Project	Solar Reserve	12	CEC Approved - Decision #72186, #72187	2021	230
SunZia Southwest Transmission 500kV Project	SunZia, SWPG, SRP, TEP, Shell, TSGT	200	CEC Approved – Decision #75464	2021	500
North Gila-Imperial Valley #2 Transmission Project	ITC Holdings Group	90	CEC Not Yet Filed	2022	500
Wilmont Project	Wilmont Properties	4.5	CEC Not Yet Filed	2022	230
Big Chino Valley Pumped Storage	ITC Holdings Group	50	CEC Not Yet Filed	2025	500
Ajo Improvement Project	AIC	47	CEC Approved – Decision #70957, Amended #74086	TBD	230
Gila Bend 833MW Power Plant	GBPP	6	CEC Approved - Case #106, Case #109, Case #119	TBD	500
Ten West Link	Ten West Link, APS, SCE, DCR Transmission DCRT	114	Estimated to be filed in Oct 2016	TBD	500



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Exhibit 20

Transmission and Generation Projects That Did Not File TYP

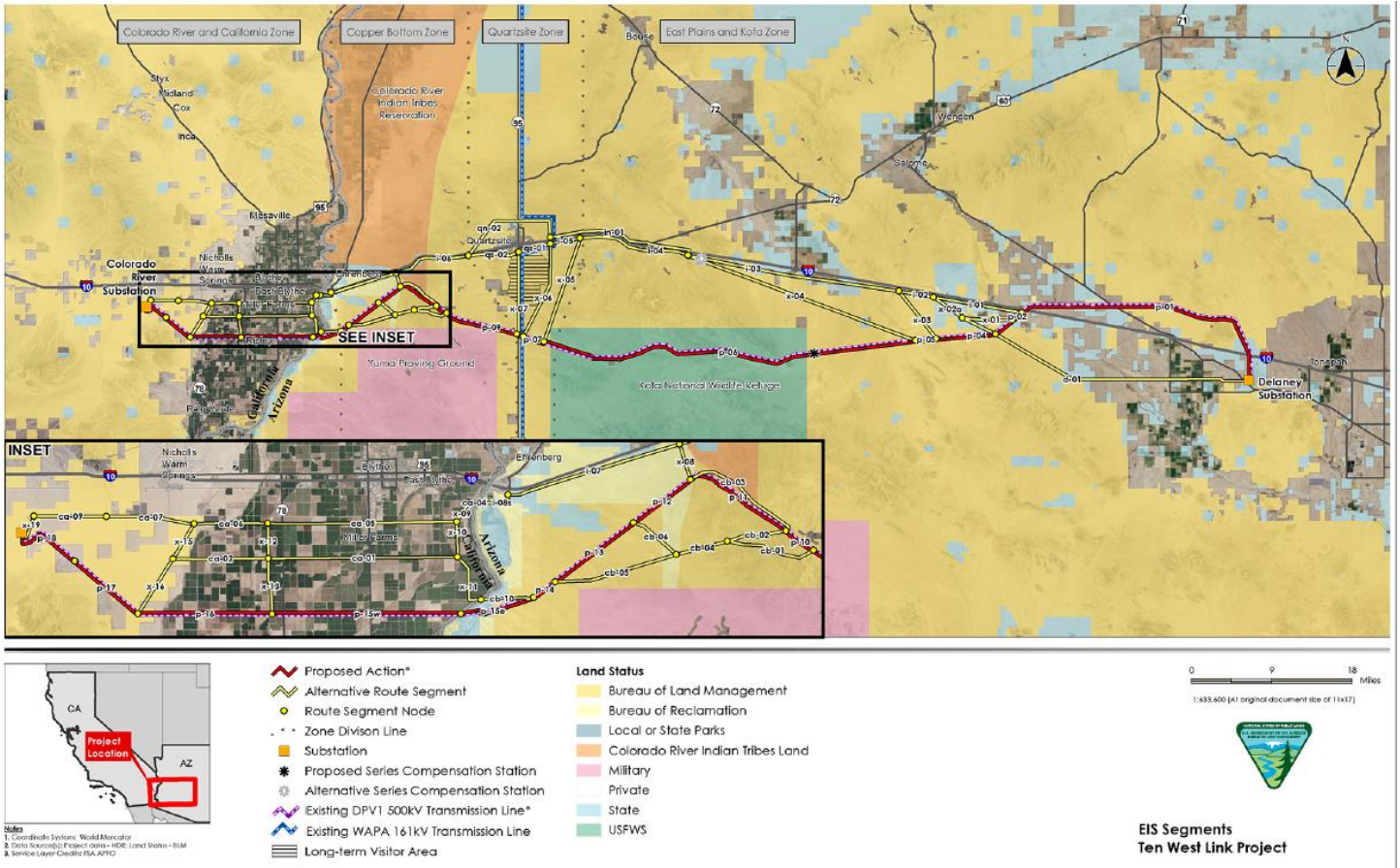
Description	Participants	Length (mi)	Permitting/Siting Status	Year	kV
Buckeye Generation Center Power Project	Buckeye Generation Center	1	CEC Not Yet Filed	2019	230
Fort Mohave Solar 332MW Project	Tribal Solar	< 1	N/A	2019	230
Greenlee Switching Station Through Hidalgo to Luna (Deming Area)	El Paso Electric	28	CEC Approved - Case #21	TBD	345
Sun Streams Solar 150MW Project	Sun Streams	< 1	CEC Approved – Decision #74688	2020	500
White Wing 200MW Solar Project	White Wing Ranch North	3	Update not provided	TBD	500



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Exhibit 21

Overview Map of Ten West Link (Delaney – Colorado River) 500 kV Project





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Exhibit 22 Overview Map of Southline Transmission Project



The Project will have a right-of-way up to 200 feet wide.

LEGEND	Approved Route	Substation End Point		
	Intermediate Substation Location	Proposed Substation Location		
	City/Town			



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Exhibit 23

Overview Map of SunZia Southwest Transmission Project

