

APPENDIX H – IMPACT LEVELS

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APPENDIX H – IMPACT TABLES

Table H-1. Impact Levels for Earth Resources – Geologic Hazards

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Level (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 1: SunZia East Substation to Midpoint Substation	Subroute 1A – North River Crossing	219.5	1739	1196	215.4	3.6	0.5	—	—	<ul style="list-style-type: none"> Flood hazard associated with the tributaries of the Rio Grande, specifically on the west side Quaternary faults on either side of the Rio Grande 	
	Subroute 1A1 –	228.8	1813	1238	224.3	3.7	0.8	—	—	<ul style="list-style-type: none"> Flood hazard associated with the tributaries of the Rio Grande, specifically on the west side Quaternary faults on either side of the Rio Grande 	
	Subroute 1A2 – BLM Preferred Alternative	230.3	1819	1270	225.8	3.7	0.8	—	—	<ul style="list-style-type: none"> Flood hazard associated with the tributaries of the Rio Grande, specifically on the west side Quaternary faults on either side of the Rio Grande 	
	Subroute 1B – San Antonio Crossing										
	Subroute 1B1	223.6	1772	1189	219.1	3.4	1.1	—	—	<ul style="list-style-type: none"> Flood hazard associated with the tributaries of the Rio Grande, specifically on the west side Quaternary faults on either side of the Rio Grande 	
	Subroute 1B2	209.2	1657	1121	204.7	3.4	1.1	—	—	<ul style="list-style-type: none"> Flood hazard associated with the tributaries of the Rio Grande, specifically on the west side Quaternary faults on either side of the Rio Grande 	
	Subroute 1B3	206.3	1635	1106	201.8	3.4	1.1	—	—	<ul style="list-style-type: none"> Flood hazard associated with the tributaries of the Rio Grande, specifically on the west side Quaternary faults on either side of the Rio Grande 	
	Local Alternative and Crossover Links for Route Group 1										
	Local Alternative Links for 1A and 1B1 (Gran Quivira)										
	E81	21.7	172	120	21.7	—	—	—	—	<ul style="list-style-type: none"> No known geological hazards 	
	E82-E83-E84	33.5	345	99	33.5	—	—	—	—	<ul style="list-style-type: none"> No known geological hazards 	
	E85	7.2	74	24	7.2	—	—	—	—	<ul style="list-style-type: none"> No known geological hazards 	

Table H-1. Impact Levels for Earth Resources – Geologic Hazards

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Level (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 1: SunZia East Substation to Midpoint Substation	Local Alternative Links for 1A, 1B1, 1B2, 1B3									
	A161b	18.6	147	109	18.6	—	—	—	—	• No known geological hazards
	A260	28.4	225	153	28.4	—	—	—	—	• 3 faults within 1 mile
	A361-A430-A481	48	380	264	44.5	2	1.5	—	—	• Link A430 crosses one fault • Links A430 and A481 cross 100-year floodplains
	Crossover Links 1B2, 1B3									
A70	7.7	61	42	7.7	—	—	—	—	• No known geological hazards	
Route Group 3: Midpoint Substation to Willow-500 kV Substation	Subroute 3A – North	123.4	978	665	116.2	3.6	3.6	—	—	• Crosses only one Quaternary fault: the Gold Hill Fault Zone located along Link B120b • Crosses numerous washes and channels that contain 100-year floodplains; most of these are associated with the Mimbres and San Simon rivers, but numerous smaller ephemeral streams and washes have areas within 100-year floodplains • No FEMA data for Hidalgo County
	Subroute 3A2 – BLM Preferred Alternative	123.9	979	673	116.5	4.1	3.3	—	—	• Crosses only one Quaternary fault: the Gold Hill Fault Zone located along Link B120b • Crosses numerous washes and channels that contain 100-year floodplains; most of these are associated with the Mimbres and San Simon rivers, but numerous smaller ephemeral streams and washes have areas within 100-year floodplains • No FEMA data for Hidalgo County
	Subroute 3B – South	128.6	1019	638	122.7	3.3	2.6	—	—	• Does not cross any Quaternary fault • The two crossover links, B111 and B140, also do not cross any Quaternary fault • Crosses fewer 100-year floodplains than Subroute 3A
	Local Alternative and Crossover Links for Route Group 3									
	Crossover Links 3A, 3B									
B111	6.9	55	35	6.9	—	—	—	—	• No known geological hazards	

Table H-1. Impact Levels for Earth Resources – Geologic Hazards

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Level (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
	B140	8.3	66	46	8.3	—	—	—	—	<ul style="list-style-type: none"> No known geological hazards 	
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Subroute 4A – North of Mt. Graham	132.9	1053	778	127.9	4.2	0.8	—	—	<ul style="list-style-type: none"> Crosses two Quaternary faults: the Safford Fault Zone along Link B153a, and the Whitlock Wash Fault at Link C173 located east of Mammoth on the eastern side of the San Pedro River Valley Crosses three fissures located along Link C850 Crosses numerous areas with 100-year floodplains; a majority of these areas is associated with the San Simon and San Pedro rivers and their tributaries 	
	Subroute 4B – Sulphur Springs Valley	133	1054	793	129.8	1.5	1.7	—	—	<ul style="list-style-type: none"> Geological hazards are similar to those along Subroute 4A Crosses numerous areas with 100-year floodplains; a majority of these areas is associated with Sulphur Spring Valley, Aravaipa Canyon, and San Pedro River and its tributaries 	
	Subroute 4C										
	Subroute 4C1 – San Pedro Valley	139	1101	802	130.5	5.1	0.4	—	—	<ul style="list-style-type: none"> Crosses one Quaternary fault; the Whitlock Wash Fault at Link C510, located on the eastern side of the San Pedro River Valley Crosses 3 fissures located along Link C850 Crosses numerous areas with 100-year floodplains; a majority of these areas is associated with the San Pedro River and its tributaries 	
	Subroute 4C2 – San Pedro Valley	151.8	1203	870	144.2	7.2	0.4	—	—	<ul style="list-style-type: none"> Crosses three fissures located along Link C850 Crosses a similar amount of 100-year floodplains as Subroute 4C1 	
	Subroute 4C2c – West of San Pedro River – BLM Preferred Alternative	161.2	1277	928	152.1	8.7	0.4	—	—	<ul style="list-style-type: none"> Crosses three fissures located along Link C850 Crosses similar mileages of 100-year floodplains as other Route Group 4 subroutes, except Subroute 4C3 	

Table H-1. Impact Levels for Earth Resources – Geologic Hazards

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Level (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Subroute 4C3 – Tucson	172.9	1370	892	149.6	22.9	0.4	—	—	<ul style="list-style-type: none"> • Crosses three fissures located along Link C850 • Crosses more areas with 100-year floodplains than subroutes 4C1 or 4C2, which is due to crossing the Santa Cruz River for a large portion of its length 	
	Local Alternative and Crossover Links for Route Group 4										
	Local Alternative Link for 4A, 4B, 4C1										
	C790	8.8	70	40	8.1	0.7	—	—	—	• Potential flooding along washes	
	Local Alternative Links for 4A, 4B, 4C1, 4C2, 4C3										
	C860	6.9	55	36	6.2	0.3	0.4	—	—	<ul style="list-style-type: none"> • Fissures present • Potential flooding along washes 	
	C870	0.2	2	1	0.2	—	—	—	—	• Fissures present	
	C890	2.8	22	11	2.6	0.2	—	—	—	• Fissures may be present	
	Local Alternative Links for 4C1										
	C692	4.8	38	25	4.8	—	—	—	—	• No known geological hazards	
	Local Alternative Links for 4C2 – Winchester and Tortolita Substations										
	C260-C261-C201	31	246	205	30.9	0.1	—	—	—	• Potential flooding near the San Pedro River	
	C680	26.1	207	139	25.5	0.6	—	—	—	• Potential flooding near the Big Wash	
	C815	0.9	7	4	0.9	—	—	—	—	• No known geological hazards	
	C814	1	8	5	1	—	—	—	—	• No known geological hazards	
	C816	0.1	1	1	0.1	—	—	—	—	• No known geological hazards	
	C812	3.3	26	17	3.3	—	—	—	—	• No known geological hazards	
	C813	0.5	4	3	0.5	—	—	—	—	• No known geological hazards	
	C810	2	16	10	2	—	—	—	—	• No known geological hazards	
	C810a	1.7	14	9	1.7	—	—	—	—	• No known geological hazards	
C817	1.8	14	9	1.8	—	—	—	—	• No known geological hazards		
Local Alternative Links for 4C3											
F40b-F51-F60a	11.1	88	63	9.7	1.4	—	—	—	<ul style="list-style-type: none"> • Link F40b crosses flooding areas along Agua Verde Creek • Link F51 crosses flooding areas along Pantano Wash 		

Table H-1. Impact Levels for Earth Resources – Geologic Hazards

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Level (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
	F81a-F81b	32.2	255	136	7.6	24.6	—	—	—	<ul style="list-style-type: none"> Links cross flooding areas along the Pantano Wash and Rillito Creek
	C812	3.3	26	17	3.3	—	—	—	—	<ul style="list-style-type: none"> No known geological hazards
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Local Alternative Links for 4C1, 4C2, 4C3									
	C72-C90-C121-C211	24.5	194	130	18	5.9	0.6	—	—	<ul style="list-style-type: none"> Flooding potential in Sulphur Springs Valley
	Crossover Links for 4A, 4B, 4C1									
	C500	5.1	40	38	5.1	—	—	—	—	<ul style="list-style-type: none"> Slight flooding potential in one wash
	C501	4.8	38	32	4.7	—	0.1	—	—	<ul style="list-style-type: none"> Link crosses the Whitlock Wash fault
	C502	3.9	31	25	3.6	0.3	—	—	—	<ul style="list-style-type: none"> Flooding potential in two washes
	C174	3.1	25	22	3.1	—	—	—	—	<ul style="list-style-type: none"> No known geological hazards
	Crossover Links for 4A, 4B, 4C1, 4C2									
	C671	7.9	63	48	7.8	0.1	—	—	—	<ul style="list-style-type: none"> Slight flooding potential in one wash
*The ground disturbance is the estimated amount of potential temporary and permanent disturbance for the Project's two proposed 500 kV transmission lines and associated facilities.										

Table H-2. Impact Levels for Earth Resources – Mineral

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 1: SunZia East Substation to Midpoint Substation	Subroute 1A – North River Crossing	219.5	1739	1196	124	94.9	0.6	—	—	<ul style="list-style-type: none"> • 4 active mines located within the study corridor of Subroute 1A, with none crossed by the centerline • 4 active mining claims in the study corridor for Subroute 1A1, with 1.6 mile of active mining claims crossed by the centerline • Does not cross any oil or gas leases 	
	Subroute 1A1	228.8	1813	1238	154.5	74.3	—	—	—	<ul style="list-style-type: none"> • 4 active mining claims located within the study corridor of Subroute 1A1, with none crossed by the centerline • 4 active mining claims within study corridor for Subroute 1A1, with 1.6 miles of active mining claims crossed by the centerline • Does not cross any oil or gas leases 	
	Subroute 1A2 – BLM Preferred Alternative	230.3	1819	1270	147.3	83.0	—	—	—	<ul style="list-style-type: none"> • 4 active mines located within the study corridor of Subroute 1A2, with none crossed by the centerline • 4 active mining claims within the study corridor of Subroute 1A2, with none crossed by the centerline • Does not cross any oil or gas leases 	
	Subroute 1B – San Antonio Crossing										
	Subroute 1B1	223.6	1772	1189	128.8	92.8	2.0	—	—	<ul style="list-style-type: none"> • 2 mines located within the study corridor of Subroute 1B1, with none crossed by the subroute centerline • 5 active mining claims located within the study corridor for Subroute 1B1, with 0.1 mile of active mining claims crossed by the centerline • 2 coal resource areas located in the study corridor in the Jornada del Muerto and Carthage coal fields 	

Table H-2. Impact Levels for Earth Resources – Mineral

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 1: SunZia East Substation to Midpoint Substation	Subroute 1B2	209.2	1657	1121	121.4	82.8	5.0	—	—	<ul style="list-style-type: none"> • 2 mines located within the study corridor of Subroute 1B2, with none crossed by the subroute centerline • 5 active mining claims located within the study corridor of Subroute 1B2, with 2.1 miles of active mining claims crossed by the centerline • 3 oil and gas leases located within the study corridor for Subroute 1B2 northeast of the WSMR and southwest of Nutt, with 6.7 miles of oil and gas leases crossed by the centerline • 1 coal resource area located in the study corridor in the Carthage coal field 	
	Subroute 1B3	206.3	1635	1106	118	81.3	7.0	—	—	<ul style="list-style-type: none"> • 3 mines located within the study corridor of Subroute 1B3, with none crossed by the subroute centerline • 5 mines containing locatable mineral resources are located in the Tecolote Hills (iron) and Hot Springs (manganese, copper, and silver) mining districts • 27 mines containing salable mineral resources (sand and gravel) are located in the Chupadero Mountains mining district • 1 oil and gas lease located within the study corridor of Subroute 1B3 southwest of Nutt, with 6.3 miles of oil and gas lease crossed by the centerline • 1 coal resource area located within the study corridor for Subroute 1B3 in the Carthage coal field 	
	Local Alternative and Crossover Links for Route Group 1										
	Local Alternative Links for 1A and 1B1 (Gran Quivira)										
	E81	21.7	172	120	4.6	17.1	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to below moderate levels 	

Table H-2. Impact Levels for Earth Resources – Mineral

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 1: SunZia East Substation to Midpoint Substation	E82-E83-E84	33.5	345	99	20.6	12.9	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerlines of this link • All impacts may be mitigated to below moderate levels 	
	E85	7.2	74	24	2.4	4.8	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to below moderate levels 	
	Local Alternative Links for 1A, 1B1, 1B2, 1B3										
	A161b	18.6	147	109	3	15.6	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • 1 mine along the link centerline • All impacts may be mitigated to below moderate levels 	
	A260	28.4	225	153	21.1	7.3	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • 7 mines located along the Link A260 centerline • All impacts may be mitigated to below moderate levels 	
	A361-A430-A481	48	380	264	18.5	29.5	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to below moderate levels 	
	Crossover Link s 1B2, 1B3										
	A70	7.7	61	42	2	5.7	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to below moderate levels 	

Table H-2. Impact Levels for Earth Resources – Mineral

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 3: Midpoint Substation to Willow-500 kV Substation	Subroute 3A – North	123.4	978	665	54.4	69.0	—	—	—	<ul style="list-style-type: none"> • 6 active mines located within the study corridor of Subroute 3A, with none crossed by the subroute centerline • 7 active mining claims within the study corridor for Subroute 3A, with 3.9 miles of active mining claims crossed by the centerline • 1 oil and gas lease is located within the study corridor for Subroute 3A, with 4 miles of oil and gas lease being crossed by the centerline 	
	Subroute 3A2 – BLM Preferred	123.9	979	673	55.4	68.5	—	—	—	<ul style="list-style-type: none"> • 8 mines located within the study corridor of Subroute 3A2, with none crossed by the centerline • 1 oil and gas lease is located within the study corridor for Subroute 3A2, with 4 miles of oil and gas lease being crossed by the centerline 	
	Subroute 3B – South	128.6	1019	638	82.0	45.6	1.0	—	—	<ul style="list-style-type: none"> • 17 active mines located within the study corridor of Subroute 3B, with none crossed by the subroute centerline • 5 active mining claims within the study corridor for Subroute 3B, with none crossed by the centerline • No oil and gas leases crossed by this alternative 	
	Local Alternative and Crossover Links for Route Group 3										
	Crossover Links 3A, 3B										
		B111	6.9	55	35	6.9	—	—	—	—	<ul style="list-style-type: none"> • No impacts to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to low levels
	B140	8.3	66	46	—	8.3	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerline of this link 	

Table H-2. Impact Levels for Earth Resources – Mineral

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Subroute 4A – North of Mt. Graham	132.9	1053	778	55.4	69.5	8.0	—	—	<ul style="list-style-type: none"> • 2 active mines located within the study corridor of Subroute 4A, with 0.2 mile of active mines crossed by the centerline • 7 active mining claims within the study corridor for Subroute 4A, with 19.4 miles of active mining claim crossed by the centerline 	
	Subroute 4B – Sulphur Springs Valley	133	1054	793	44.1	80.9	8.0	—	—	<ul style="list-style-type: none"> • Mineral resources are similar to those along Subroute 4A 	
	Subroute 4C										
	Subroute 4C1 – San Pedro Valley	139	1101	802	57.2	80.8	1.0	—	—	<ul style="list-style-type: none"> • 2 active mines located within the study corridor of Subroute 4C1, with 0.2 mile of active mines crossed by the subroute centerline • 3 active mining claims are located within the study corridor for Subroute 4C1, with 10.1 miles of active mining claims crossed by the centerline 	
	Subroute 4C2 – San Pedro Valley	151.8	1203	870	69.2	81.6	1	—	—	<ul style="list-style-type: none"> • 1 active mine located within the study corridor of Subroute 4C2, with 0.1 mile of active mines crossed by the subroute centerline. • 2 active mining claims are located with the study corridor for study corridor for Subroute 4C2, with 16.4 miles of active mining claims crossed by the centerline 	
Subroute 4C2c – West San Pedro River – BLM Preferred Alternative	161.2	1277	928	86.7	74.5	—	—	—	<ul style="list-style-type: none"> • 1 active mine located within the study corridor of Subroute 4C2, with 0.1 mile of active mines crossed by the subroute centerline. • 2 active mining claims are located with the study corridor for study corridor for Subroute 4C2, with 16.4 miles of active mining claims crossed by the centerline 		

Table H-2. Impact Levels for Earth Resources – Mineral

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Subroute 4C3 – Tucson	172.9	1370	892	104.7	67.8	0.4	—	—	<ul style="list-style-type: none"> • 5 active mines located within the study corridor for Subroute 4C3, with 0.2 mile of active mines crossed by the centerline • 1 active mining claim is located within the study corridor, with 13.5 miles of active mining claims crossed by the centerline 	
	Local Alternative and Crossover Links for Route Group 4										
	Local Alternative Link for 4A, 4B, 4C1										
	C790	8.8	70	40	3.1	5.7	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • All impacts may be mitigated to below moderate levels 	
	Local Alternative Links for 4A, 4B, 4C1, 4C2, 4C3										
	C860	6.9	55	36	3.9	3	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • All impacts may be mitigated to moderate levels or below 	
	C870	0.2	2	0.9	0.2	—	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mining claims directly crossed by the centerline of this link • All impacts may be mitigated to less than moderate levels 	
	C890	2.8	22	11	2.8	—	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims. • No mining claims directly crossed by the centerline of this link • All impacts may be mitigated to less than moderate levels 	
	Local Alternative Links for 4C1										
	C692	4.8	38	25	4	0.8	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • All impacts may be mitigated to less than moderate levels 	

Table H-2. Impact Levels for Earth Resources – Mineral

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Local Alternative Links for 4C2 – Winchester and Tortolita Substations									
	C260-C261-C201	31	246	205	4.5	26.5	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to less than moderate levels
	C680	26.1	207	139	23.2	2.9	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to less than moderate levels
	C815	0.9	7	4	0.9	—	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to less than moderate levels
	C814	1	8	5	1	—	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to less than moderate levels
	C816	0.1	1	1	0.1	—	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to less than moderate levels
	C812	3.3	26	17	2.4	0.9	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to less than moderate levels
	C813	0.5	4	3	0.5	—	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to less than moderate levels

Table H-2. Impact Levels for Earth Resources – Mineral

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	C810	2	16	10	2	—	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to less than moderate levels 	
	C810a	1.7	14	9	1.3	0.4	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to less than moderate levels 	
	C817	1.8	14	9	1.8	—	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern along Link C817 is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to less than moderate levels 	
	Local Alternative Links for 4C3										
	F40b-F51-F60a	11.1	88	63	6.1	5	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to less than moderate levels 	
	F81a-F81b	32.2	255	136	30.8	1.4	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • 5 mines located within along the centerline of links F81a-F81b • All impacts may be mitigated to less than moderate levels 	
C812	3.3	26	17	2.4	0.9	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to less than moderate levels 		

Table H-2. Impact Levels for Earth Resources – Mineral

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Local Alternative Links for 4C1, 4C2, 4C3									
	C72-C90-C121-C211	24.5	194	130	13.7	5.7	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to below moderate levels
	Crossover Links for 4A, 4B, 4C1									
	C500	5.1	40	38	0.4	4.7	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern along Link C500 is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to less than moderate levels
	C501	4.8	38	32	1.8	3	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern along Link C501 is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to less than moderate levels
	C502	3.9	31	25	1.9	2	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern along Link C502 is to mining claims • 1 mine is directly crossed by the centerline of this link • All impacts may be mitigated to less than moderate levels
	C174	3.1	25	22	1	1.3	1.8	—	—	<ul style="list-style-type: none"> • Primary impact of concern along Link C174 is to mining claims • 1 mine is along the centerline of this link • All impacts may be mitigated to moderate or lower levels
	Crossover Links for 4A, 4B, 4C1, 4C2									
C671	7.9	63	48	5.4	2.5	—	—	—	<ul style="list-style-type: none"> • Primary impact of concern is to mining claims • No mines directly crossed by the centerline of this link • All impacts may be mitigated to less than moderate levels 	
*The ground disturbance is the estimated amount of potential temporary and permanent disturbance for the Project’s two proposed 500 kV transmission lines and associated facilities.										

Table H-3. Impact Levels for Earth Resource – Soils

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 1: SunZia East Substation to Midpoint Substation	Subroute 1A – North River Crossing	219.5	1739	1196	153.5	66	—	—	—	<ul style="list-style-type: none"> Lowest residual impact levels for soil resources (0 vs. 0.2 and 2.2 miles) Crosses less water erosion susceptible soils than the other Route Group 1 subroutes 	
	Subroute 1A1	228.8	1813	1238	162	66.6	0.2	—	—	<ul style="list-style-type: none"> 	
	Subroute 1A2 – BLM Preferred Alternative	230.3	1819	1270	156.5	71.6	2.2	—	—	<ul style="list-style-type: none"> Impact of concern for soil resources is soils that are highly susceptible to water erosion along links E86a and E86b Highest residual impact levels for soil resources of the 1A subroutes 	
	Subroute 1B – San Antonio Crossing										
	Subroute 1B1	223.6	1772	1189	149.3	74.2	0.1	—	—	<ul style="list-style-type: none"> Impact of concern for soil resources is soils that are highly susceptible to wind erosion Most of these soils are in the Jornada del Muerto 	
	Subroute 1B2	209.2	1657	1121	140	69.1	0.1	—	—	<ul style="list-style-type: none"> Impact of concern for soil resources is soils that are highly susceptible to wind erosion Most of these soils are in the Jornada del Muerto Mileage for soils that are susceptible to water erosion are nearly equal to those that are susceptible to water erosion 	
	Subroute 1B3	206.3	1635	1106	142.2	64	0.1	—	—	<ul style="list-style-type: none"> Impact of concern for soil resources is soils that are highly susceptible to wind erosion Most of these soils are in the Jornada del Muerto 	
	Local Alternative and Crossover Links for Route Group 1										
	Local Alternative Links for 1A and 1B1 (Gran Quivira)										
	E81	21.7	172	120	4.7	16.2	0.8	—	—	<ul style="list-style-type: none"> Impact of concern for soil resources is soils that are susceptible to water erosion 	
	E82-E83-E84	33.5	345	99	14.6	18.9	—	—	—	<ul style="list-style-type: none"> Impact of concern for soil resources is soils that are susceptible to water erosion 	
	E85	7.2	74	24	1.3	5.7	0.2	—	—	<ul style="list-style-type: none"> Impact of concern for soil resources is soils that are susceptible to water erosion 	

Table H-3. Impact Levels for Earth Resource – Soils

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 1: SunZia East Substation to Midpoint Substation	Local Alternative Links for 1A, 1B1, 1B2, 1B3									
	A161b	18.6	147	109	11.4	7.2	—	—	—	• Soils that are highly and moderately susceptible to water and wind erosion are the dominant concern.
	A260	28.4	225	153	23.9	4.5	—	—	—	• Soils that are highly and moderately susceptible to water and wind erosion are the dominant concern
	A361-A430-A481	48	380	264	24.2	23.8	—	—	—	• Soils that are highly and moderately susceptible to water and wind erosion are the dominant concern
	Crossover Links 1B2, 1B3									
	A70	7.7	61	42	2	5.7	—	—	—	• Soils that are moderately susceptible to water erosion are the dominant concern
Route Group 3: Midpoint Substation to Willow-500 kV Substation	Subroute 3A – North	123.4	978	665	56.7	66.7	—	—	—	• Soils that are highly susceptible to wind erosion (20 miles) are the dominant concern for this subroute followed by designated Prime or Unique Farmland soils (14 miles)
	Subroute 3A2 – BLM Preferred Alternative	123.9	979	673	60	58.5	5.4	—	—	• Soils that are highly susceptible to wind erosion (21 miles) are the dominant concern for this subroute followed by Prime or Unique Farmland soils (14 miles)
	Subroute 3B – South	128.6	1019	638	59	69.6	—	—	—	• Designated Prime or Unique Farmland soils are the dominant concern (28 miles), mainly associated with the Mimbres and Animas rivers • Crosses 94 miles of soils moderately susceptible to water erosion

Table H-3. Impact Levels for Earth Resource – Soils

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 3: Midpoint Substation to Willow-500 kV Substation	Local Alternative and Crossover Links for Route Group 3									
	Crossover Links 3A, 3B									
	B111	6.9	55	35	6.9	—	—	—	—	<ul style="list-style-type: none"> • Soils that are highly susceptible to wind erosion are roughly equal between link B111 and B140
B140	8.3	66	46	—	8.3	—	—	—	<ul style="list-style-type: none"> • Soils that are highly susceptible to water erosion in the Animas Valley are the dominant concern • Soils that are highly susceptible to wind erosion are roughly equal between links B111 and B140. 	
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Subroute 4A – North of Mt. Graham	132.9	1053	778	93.5	39.3	0.1	—	—	<ul style="list-style-type: none"> • Designated Prime or Unique Farmland soils are the dominant concern • These soils are unique to this subroute in the Gila and San Pedro river valleys and shared with the other Route Group 4 subroutes in the vicinity of the Pinal Central Substation • Impacts can be nearly eliminated by appropriate mitigation measures
	Subroute 4B – Sulphur Springs Valley	133	1054	793	75.8	53.8	3.4	—	—	<ul style="list-style-type: none"> • Designated Prime or Unique Farmland soils are the dominant concern (27 miles) • These soils are unique to this subroute in the Sulphur Springs Valley and shared with the other Route Group 4 subroutes in the vicinity of the Pinal Central Substation • Impacts can be nearly eliminated by appropriate mitigation measures

Table H-3. Impact Levels for Earth Resource – Soils

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Subroute 4C									
	Subroute 4C1 – San Pedro Valley	139	1101	802	91.6	45.8	1.6	—	—	<ul style="list-style-type: none"> Designated Prime or Unique Farmland soils are the dominant concern (13 miles) These soils are unique to this subroute in the San Pedro river valley and shared with the other Route Group 4 subroutes in the vicinity of the Pinal Central Substation Impacts can be nearly eliminated by appropriate mitigation measures
	Subroute 4C2 – San Pedro Valley	151.8	1203	870	98.7	51.7	1.4	—	—	<ul style="list-style-type: none"> Designated Prime or Unique Farmland soils are the dominant concern (13 miles) These soils are unique to this subroute in the San Pedro river valley and shared with the other Route Group 4 subroutes in the vicinity of the Pinal Central Substation Impacts can be nearly eliminated by appropriate mitigation measures
	Subroute 4C2c – West of San Pedro River – BLM Preferred Alternative	161.2	1277	928	109.6	50.2	1.4	—	—	<ul style="list-style-type: none"> See Chapter 4 for a description of impacts to BLM preferred alternative.
	Subroute 4C3 – Tucson	172.9	1370	892	105.4	67	0.5	—	—	<ul style="list-style-type: none"> Designated Prime or Unique Farmland soils are the dominant concern (27 miles) These soils are unique to this subroute in the Sulphur Springs Valley and shared with the other Route Group 4 subroutes in the vicinity of the Pinal Central Substation Impacts can be nearly eliminated by appropriate mitigation measures

Table H-3. Impact Levels for Earth Resource – Soils

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Local Alternative and Crossover Links for Route Group 4									
	Local Alternative Link for 4A, 4B, 4C1									
	C790	8.8	70	40	6.2	2.6	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to water and wind erosion are equally dominant • Impacts can be mitigated below the moderate level
	Local Alternative Links for 4A, 4B, 4C1, 4C2, 4C3									
	C860	6.9	55	36	2.2	4.7	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to water and wind erosion are equally dominant • Impacts can be mitigated below the moderate level
	C870	0.2	2	1	—	0.2	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to water and wind erosion are equally dominant • Impacts can be mitigated below the moderate level
	C890	2.8	22	11	—	2.8	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to water and wind erosion are equally dominant • Impacts can be mitigated below the moderate level
	Local Alternative Links for 4C1									
	C692	4.8	38	25	4	0.8	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to water and wind erosion are equally dominant • Impacts can be mitigated below the moderate level

Table H-3. Impact Levels for Earth Resource – Soils

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Local Alternative Links for 4C2 – Winchester and Tortolita Substations										
	C260-C261-C201	31	246	205	25.7	4.8	0.5	—	—	<ul style="list-style-type: none"> • Soils that are highly susceptible to wind erosion are dominant • Impacts can be mitigated to the moderate level 	
	C680	26.1	207	139	22.4	3.7	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to water and wind erosion are equally dominant • Impacts can be mitigated below the moderate level 	
	C815	0.9	7	4	0.9	—	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to wind erosion are dominant • Impacts can be mitigated below the moderate level 	
	C814	1	8	5	1	—	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to wind erosion are dominant • Impacts can be mitigated below the moderate level 	
	C816	0.1	1	1	0.1	—	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to wind erosion are dominant • Impacts can be mitigated below the moderate level 	
	C812	3.3	26	17	1	2.3	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to water erosion are dominant • Impacts can be mitigated below the moderate level 	
	C813	0.5	4	3	0.5	—	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to wind erosion are dominant along this link but impacts can be mitigated below the moderate level. 	

Table H-3. Impact Levels for Earth Resource – Soils

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	C810	2	16	10	0.1	1.9	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to water and wind erosion are equally dominant • Impacts can be mitigated below the moderate level 	
	C810a	1.7	14	9	—	1.7	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to water and wind erosion are equally dominant • Impacts can be mitigated below the moderate level 	
	C817	1.8	14	9	1.8	—	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to wind erosion are dominant • Impacts can be mitigated below the moderate level 	
	Local Alternative Links for 4C3										
	F40b-F51-F60a	11.1	88	63	10.6	0.5	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to water erosion are dominant • Impacts can be mitigated below the moderate level 	
	F81a-F81b	32.2	255	136	24.6	7.6	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to water erosion are dominant • Impacts can be mitigated below the moderate level 	
	C812	3.3	26	17	1	2.3	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to water erosion are dominant • Impacts can be mitigated below the moderate level 	
	Local Alternative Links for 4C1, 4C2, 4C3										
C72-C90-C121-C211	24.5	194	130	12	12.5	—	—	—	<ul style="list-style-type: none"> • Soils that are designated as Prime or Unique Farmland are dominant • Impacts can be mitigated below the moderate level 		

Table H-3. Impact Levels for Earth Resource – Soils

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Crossover Links for 4A, 4B, 4C1									
	C500	5.1	40	38	1	4.1	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to water erosion are dominant • Impacts can be mitigated below the moderate level
	C501	4.8	38	32	3	1.8	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to water erosion are dominant • Impacts can be mitigated below the moderate level
	C502	3.9	31	25	3.9	—	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to water erosion are dominant • Impacts can be mitigated below the moderate level
	C174	3.1	25	22	0.6	2.2	0.3	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to water erosion are dominant • Impacts can be mitigated below the moderate level
	Crossover Links for 4A, 4B, 4C1, 4C2									
C671	7.9	63	48	5	2.9	—	—	—	<ul style="list-style-type: none"> • Soils that are moderately susceptible to water erosion are dominant • Impacts can be mitigated below the moderate level 	
*The ground disturbance is the estimated amount of potential temporary and permanent disturbance for the Project’s two proposed 500 kV transmission lines and associated facilities.										

Table H-4. Impact Levels for Earth Resources – Paleontological

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 1: SunZia East Substation to Midpoint Substation	Subroute 1A – North River Crossing	219.5	1739	1196	113.5	106	—	—	—	<ul style="list-style-type: none"> • 18 fossil localities within 1 mile of the centerline, including 2 Permian localities in the Abo Formation along Link E101b, which have produced fossil invertebrates, plants, and vertebrate tracks; the Abo Formation has a PFYC of 2 • 2 localities are in the Blancan Sierra Ladrone Formation along Links E151 and E180, containing a fossil proboscidean tusk, horse teeth, horse postcrania, and a camel phalanx; the Sierra Ladrone Formation has a PFYC of 4 • 14 localities are in the Blancan Palomas Formation along Link E180, and contain numerous fossil horse teeth and postcrania, an antilocaprid metatarsal, and a llama metatarsal; the Palomas Formation has a PFYC of 4
	Subroute 1A1-	228.8	1813	1238	117.6	111.2	—	—	—	<ul style="list-style-type: none"> • 18 fossil localities within 1 mile of the centerline, including 2 Permian localities in the Abo Formation along Link E101b, which have produced fossil invertebrates, plants, and vertebrate tracks; the Abo Formation has a PFYC of 2 • 2 localities are in the Blancan Sierra Ladrone Formation along Links E151 and E180, containing a fossil proboscidean tusk, horse teeth, horse postcrania, and a camel phalanx; the Sierra Ladrone Formation has a PFYC of 4 • 14 localities are in the Blancan Palomas Formation along Link E180, and contain numerous fossil horse teeth and postcrania, an antilocaprid metatarsal, and a llama metatarsal; the Palomas Formation has a PFYC of 4

Table H-4. Impact Levels for Earth Resources – Paleontological

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 1: SunZia East Substation to Midpoint Substation	Subroute 1A2-BLM Preferred Alternative	230.3	1819	1270	119.1	111.2	—	—	—	<ul style="list-style-type: none"> • 18 fossil localities within 1 mile of the centerline, including 2 Permian localities in the Abo Formation along Link E101b, which have produced fossil invertebrates, plants, and vertebrate tracks; the Abo Formation has a PFYC of 2 • 2 localities are in the Blancan Sierra Ladrones Formation along Links E151 and E180, containing a fossil proboscidean tusk, horse teeth, horse postcrania, and a camel phalanx; the Sierra Ladrones Formation has a PFYC of 4 • 14 localities are in the Blancan Palomas Formation along Link E180, and contain numerous fossil horse teeth and postcrania, an antilocaprid metatarsal, and a llama metatarsal; the Palomas Formation has a PFYC of 4 	
	Subroute 1B – San Antonio Crossing										
	Subroute 1B1	223.6	1772	1189	125.8	97.8	—	—	—	<ul style="list-style-type: none"> • 9 fossil localities within 1 mile of the centerline along Links A111 and A112 • 8 of these fossil localities are Mesozoic in age and are located within close proximity to Link A111 • 2 of these localities are within the Moenkopi Formation of Triassic age and contain fossil capitosaurids • 2 other localities are within the Chinle Group of Triassic age and contain archosaur and reptile fossils • 4 other localities are within the Mancos Shale and Greenhorn Limestone of Cretaceous age • 9 localities located along Link A112 in the Sierra Ladrones Formation of Pleistocene age and contains fossil turkey, horse, and camel 	
	Subroute 1B2	209.2	1657	1121	111.4	97.8	—	—	—	• Same as Subroute 1B1	
Subroute 1B3	206.3	1635	1106	111	95.3	—	—	—	• Same as Subroute 1B1		

Table H-4. Impact Levels for Earth Resources – Paleontological

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 1: SunZia East Substation to Midpoint Substation	Local Alternative and Crossover Links for Route Group 1									
	Local Alternative Links for 1A and 1B1 (Gran Quivira)									
	E81	21.7	172	120	21.7	—	—	—	—	• No fossil localities within 1 mile of centerline, and low PFYC
	E82-E83-E84	33.5	345	99	33.5	—	—	—	—	• No fossil localities within 1 mile of centerline and low PFYC
	E85	7.2	74	24	7.2	—	—	—	—	• No fossil localities within 1 mile of centerline and low PFYC
	Local Alternative Links for 1A, 1B1, 1B2, 1B3									
	A161b	18.6	147	109	4.3	14.3	—	—	—	• No fossil localities within 1 mile of centerline and low and high PFYC
	A260	28.4	225	153	1.9	26.5	—	—	—	• No fossil localities within 1 mile of centerline and low and high PFYC
	A361-A430-A481	48	380	264	36.2	11.8	—	—	—	• No fossil localities within 1 mile of centerline and low and high PFYC
	Crossover Links 1B2, 1B3									
A70	7.7	61	42	7.7	—	—	—	—	• No fossil localities within 1 mile of centerline and low PFYC	
Route Group 3: Midpoint Substation to Willow-500 kV Substation	Subroute 3A – North	123.4	978	665	96.4	27	—	—	—	• Gila Conglomerate, including the 111 Ranch Beds containing fossil land mammals
	Subroute 3A2 – BLM Preferred Alternative	123.9	979	673	94.1	29.8	—	—	—	• Gila Conglomerate, including the 111 Ranch Beds containing fossil land mammals
	Subroute 3B – South	128.6	1019	638	119	9.6	—	—	—	• Crosses less Gila Conglomerate than Subroute 3A
	Local Alternative and Crossover Links for Route Group 3									
	Crossover Links 3A, 3B									
	B111	6.9	55	35	5.2	1.7	—	—	—	• No fossil localities within 1 mile of centerline and low and high PFYC
	B140	8.3	66	46	8.3	—	—	—	—	• No fossil localities within 1 mile of centerline and low PFYC

Table H-4. Impact Levels for Earth Resources – Paleontological

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Subroute 4A – North of Mt. Graham	132.9	1053	778	107.4	25.5	—	—	—	<ul style="list-style-type: none"> Gila Conglomerate, including the 111 Ranch Beds containing fossil land mammals 	
	Subroute 4B – Sulphur Springs Valley	133	1054	793	98.1	34.9	—	—	—	<ul style="list-style-type: none"> Crosses state map unit Tsy, which is likely Gila Group in southeastern Arizona The Gila Group includes fossiliferous units including the 111 Ranch Beds, Quiburis Formation, and St. Davids Formation Given its location, this subroute likely crosses the Quiburis or St. Davids Formation 	
	Subroute 4C										
	Subroute 4C1 – San Pedro Valley	139	1101	802	87.2	51.8	—	—	—	<ul style="list-style-type: none"> Crosses the length of the San Pedro River Valley that includes the Quiburis and St. Davids formations. Numerous fossil localities are known in the San Pedro River Valley 	
	Subroute 4C2 – San Pedro Valley	151.8	1203	870	104.2	47.6	—	—	—	<ul style="list-style-type: none"> Crosses the length of the San Pedro River Valley that includes the Quiburis and St. Davids formations. Numerous fossil localities are known in the San Pedro River Valley. 	
	Subroute 4C2c – West San Pedro River – BLM Preferred Alternative	161.2	1277	928	115.6	45.6	—	—	—	<ul style="list-style-type: none"> Crosses the length of the San Pedro River Valley that includes the Quiburis and St. Davids formations. Numerous fossil localities are known in the San Pedro River Valley. 	
	Subroute 4C3 – Tucson	172.9	1370	892	158.1	14.8	—	—	—	<ul style="list-style-type: none"> The least paleontological sensitive subroute of Route Group 4 Crosses the fossiliferous deposits of the San Pedro river valley perpendicularly rather than paralleling the river like 4C1 and 4C2; this limits the amount of Tertiary deposits 4C3 crosses The little known, but fossil-producing Mineta Formation is crossed by this subroute; fossils occur rarely in the Quaternary deposits of the Tucson Basin 	

Table H-4. Impact Levels for Earth Resources – Paleontological

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Local Alternative and Crossover Links for Route Group 4									
	Local Alternative Link for 4A, 4B, 4C1									
	C790	8.8	70	40	8.8	—	—	—	—	• No fossil localities within 1 mile of centerline and moderate PFYC
	Local Alternative Links for 4A, 4B, 4C1, 4C2, 4C3									
	C860	6.9	55	36	6.9	—	—	—	—	• No fossil localities within 1 mile of centerline and moderate PFYC
	C870	0.2	2	1	0.2	—	—	—	—	• No fossil localities within 1 mile of centerline and moderate PFYC
	C890	2.8	22	11	2.8	—	—	—	—	• No fossil localities within 1 mile of centerline and moderate PFYC
	Local Alternative Links for 4C1									
	C692	4.8	38	25	—	4.8	—	—	—	• No fossil localities within 1 mile of centerline and high PFYC
	Local Alternative Links for 4C2 – Winchester and Tortolita substations									
	C260-C261-C201	31	246	205	26.8	4.2	—	—	—	• One fossil locality along Link C201 and low to high PFYC
	C680	26.1	207	139	13	13.1	—	—	—	• No fossil localities within 1 mile of centerline and low to high PFYC
	C815	0.9	7	4	0.9	—	—	—	—	• No fossil localities within 1 mile of centerline and moderate PFYC
	C814	1	8	5	1	—	—	—	—	• No fossil localities within 1 mile of centerline and moderate PFYC
	C816	0.1	1	1	0.1	—	—	—	—	• No fossil localities within 1 mile of centerline and moderate PFYC
	C812	3.3	26	17	3.3	—	—	—	—	• No fossil localities within 1 mile of centerline and low to moderate PFYC
C813	0.5	4	3	0.5	—	—	—	—	• No fossil localities within 1 mile of centerline and moderate PFYC	
C810	2	16	10	2	—	—	—	—	• No fossil localities within 1 mile of centerline and low to moderate PFYC	
C810a	1.7	14	9	1.7	—	—	—	—	• No fossil localities within 1 mile of centerline and moderate PFYC	

Table H-4. Impact Levels for Earth Resources – Paleontological

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	C817	1.8	14	9	1.8	—	—	—	—	• No fossil localities within 1 mile of centerline and moderate PFYC	
	Local Alternative Links for 4C3										
	F40b-F51-F60a	11.1	88	63	11.1	—	—	—	—	• No fossil localities within 1 mile of centerline and low to moderate PFYC	
	F81a-F81b	32.2	255	136	32.2	—	—	—	—	• No fossil localities within 1 mile of centerline and low to moderate PFYC	
	C812	3.3	26	17	3.3	—	—	—	—	• No fossil localities within 1 mile of centerline and low to moderate PFYC	
	Local Alternative Links for 4C1, 4C2, 4C3										
	C72-C90-C121-C211	24.5	194	130	19.5	5	—	—	—	• No fossil localities within 1 mile of centerline and low to high PFYC	
	Crossover Links for 4A, 4B, 4C1										
	C500	5.1	40	38	0.1	5	—	—	—	• No fossil localities within 1 mile of centerline and low and high PFYC	
	C501	4.8	38	32	—	4.8	—	—	—	• No fossil localities within 1 mile of centerline and high PFYC	
	C502	3.9	31	25	—	3.9	—	—	—	• No fossil localities within 1 mile of centerline and high PFYC	
	C174	3.1	25	22	—	3.1	—	—	—	• No fossil localities within 1 mile of centerline and high PFYC	
	Crossover Links for 4A, 4B, 4C1, 4C2										
	C671	7.9	63	48	7.9	—	—	—	—	• No fossil localities within 1 mile of centerline and low to moderate PFYC	
	*The ground disturbance is the estimated amount of potential temporary and permanent disturbance for the Project’s two proposed 500 kV transmission lines and associated facilities.										

Table H-5. Impact Levels for Earth Resources – Water

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 1: SunZia East Substation to Midpoint Substation	Subroute 1A – North River Crossing	219.5	1739	1196	219.4	0.1	—	—	—	<ul style="list-style-type: none"> • Crosses 0 perennial streams and 412 intermittent and ephemeral drainages • Most of these streams are located within the Rio Grande Watershed 	
	Subroute 1A1 –	228.8	1813	1238	228.7	0.1	—	—	—	<ul style="list-style-type: none"> • Crosses 0 perennial streams and 453 intermittent and ephemeral drainages • Most of these streams are located within the Rio Grande Watershed 	
	Subroute 1A2 – BLM Preferred Alternative	230.3	1819	1270	230.2	0.1	—	—	—	<ul style="list-style-type: none"> • Crosses 0 perennial streams and 462 intermittent and ephemeral drainages • Most of these streams are located within the Rio Grande Watershed 	
	Subroute 1B – San Antonio Crossing										
	Subroute 1B1	223.6	1772	1189	223.5	0.1	—	—	—	<ul style="list-style-type: none"> • Crosses 0 perennial streams and 391 intermittent and ephemeral drainages • 1 spring is located within the study corridor along Link A90 	
	Subroute 1B2	209.2	1657	1121	209.1	0.1	—	—	—	<ul style="list-style-type: none"> • Similar to Subroute 1B1 for most of its length • Crosses 19 perennial streams and 362 intermittent and ephemeral drainages 	
	Subroute 1B3	206.3	1635	1106	206.2	0.1	—	—	—	<ul style="list-style-type: none"> • Similar to Subroute 1B1 for most of its length • Crosses 0 perennial streams and 370 intermittent and ephemeral drainages • 2wells are located within the study corridor along Link A80 	
	Local Alternative and Crossover Links for Route Group 1										
	Local Alternative Links for 1A and 1B1 (Gran Quivira)										
	E81	21.7	172	120	21.2	0.5	—	—	—	• 1.8 miles of intermittent streams	
E82-E83-E84	33.5	345	99	32.8	0.7	—	—	—	<ul style="list-style-type: none"> • 1.7 miles of intermittent streams • 0.3 mile of perennial streams 		
E85	7.2	74	2	6.8	0.4	—	—	—	• 1.4 miles of intermittent streams		

Table H-5. Impact Levels for Earth Resources – Water

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 1: SunZia East Substation to Midpoint Substation	Local Alternative Links for 1A, 1B1, 1B2, 1B3									
	A161b	18.6	147	109	16.8	1.8	—	—	—	<ul style="list-style-type: none"> • 0.4 mile of perennial • 5.2 miles of intermittent streams
	A260	28.4	225	153	24.9	3.5	—	—	—	<ul style="list-style-type: none"> • 1.2 miles of perennial • 9.3 miles of intermittent streams
	A361-A430-A481	48.1	380	264	48	0.1	—	—	—	No perennial or intermittent streams
	Crossover Link s 1B2, 1B3									
	A70	7.7	61	42	7.6	0.1	—	—	—	<ul style="list-style-type: none"> • 8 intermittent streams
Route Group 3: Midpoint Substation to Willow-500 kV Substation	Subroute 3A – North	123.4	978	665	120.7	2.7	—	—	—	<ul style="list-style-type: none"> • Crosses 0 perennial streams and 213 intermittent and ephemeral drainages • 3 wells are located within the study corridor along Link B160b
	Subroute 3A2 – BLM Preferred Alternative	123.9	979	673	123.8	0.1	—	—	—	<ul style="list-style-type: none"> • Crosses 0 perennial streams and 213 intermittent and ephemeral drainages
	Subroute 3B – South	128.6	1019	638	124.4	4.2	—	—	—	<ul style="list-style-type: none"> • Crosses 0 perennial streams and 198 intermittent and ephemeral drainages • 8 wells are located within the study corridor along links B110a, B112, and B150b
	Local Alternative and Crossover Links for Route Group 3									
	Crossover Links 3A, 3B									
	B111	6.9	55	35	6.5	0.4	—	—	—	<ul style="list-style-type: none"> • 0.4 mile of perennial streams • 3.2 miles of intermittent streams
	B140	8.3	66	46	8.3	—	—	—	—	<ul style="list-style-type: none"> • 0.4 mile of intermittent streams

Table H-5. Impact Levels for Earth Resources – Water

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Subroute 4A – North of Mt. Graham	132.9	1053	778	109.5	23.4	—	—	—	<ul style="list-style-type: none"> • Crosses Aravaipa Creek at Link C170 and the San Pedro River at Link C592 • Crosses 2 perennial streams and 231 intermittent and ephemeral drainages • 17 wells and 2 springs located within the study corridor along links B153a, B153b, C170, C178, C173, C620, C780, and C880a • Crosses 21.1 miles of the Santa Cruz Sole Source Aquifer 	
	Subroute 4B – Sulphur Springs Valley	133	1054	793	106.7	26.3	—	—	—	<ul style="list-style-type: none"> • Similar to Subroute 4A for most of its length • Crosses 1 perennial streams and 232 intermittent and ephemeral drainages 	
	Subroute 4C										
	Subroute 4C1 – San Pedro Valley	139	1101	802	108	31	—	—	—	<ul style="list-style-type: none"> • This route crosses 13 perennial streams and 221 intermittent and ephemeral drainages • 28 wells located within the study corridor along links C110, C470, C660, C690, C880, and C880a • Crosses 25.4 miles of the Santa Cruz Sole Source Aquifer 	
	Subroute 4C2 – San Pedro Valley	151.8	1203	870	96.4	55.4	—	—	—	<ul style="list-style-type: none"> • Crosses 0 perennial streams and 254 intermittent and ephemeral drainages • 25 wells located within the study corridor along links C110, 266, C450 and C680 • Crosses 42 miles of the Santa Cruz Sole Source Aquifer 	
	Subroute 4C2c – West San Pedro River – BLM Preferred Alternative	161.2	1277	928	103.3	57.9	—	—	—	<ul style="list-style-type: none"> • Crosses 1 perennial streams and 323 intermittent and ephemeral drainages 	

Table H-5. Impact Levels for Earth Resources – Water

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Subroute 4C3 – Tucson	172.9	1370	892	113.4	59.5	—	—	—	<ul style="list-style-type: none"> • Crosses many more streams than the other subroutes in this route group • Crosses 2 large rivers • Crosses 0 perennial streams and 400 intermittent and ephemeral drainages • 169 wells located within the study corridor along links C110, F40a, F600, F111, F112, and F510 • Crosses 87.6 miles of the Santa Cruz Sole Source Aquifer 	
	Local Alternative and Crossover Links for Route Group 4										
	Local Alternative Link for 4A, 4B, 4C1										
	C790	8.8	70	40	8.8	—	—	—	—	<ul style="list-style-type: none"> • Crosses 3.3 miles of sole source aquifer • 12 intermittent streams 	
	Local Alternative Links for 4A, 4B, 4C1, 4C2, 4C3										
	C860	6.9	55	36	6.9	—	—	—	—	<ul style="list-style-type: none"> • 0.2 mile of perennial streams • 2.1 miles of intermittent streams 	
	C870	0.2	2	1	0.2	—	—	—	—	<ul style="list-style-type: none"> • 0.1 mile of intermittent streams 	
	C890	2.8	22	11	2.8	—	—	—	—	<ul style="list-style-type: none"> • 0.1 mile of intermittent streams 	
	Local Alternative Links for 4C1										
	C692	4.8	38	25	—	4.8	—	—	—	<ul style="list-style-type: none"> • 4.8 miles of sole source aquifer • 0.1 mile of perennial streams • 0.7 mile of intermittent streams 	
	Local Alternative Links for 4C2 – Winchester and Tortolita Substations										
	C260-C261-C201	31	246	205	24.1	6.9	—	—	—	<ul style="list-style-type: none"> • 1.5 miles of perennial streams • 9.9 miles of intermittent streams 	
	C680	26.1	207	139	5.5	20.6	—	—	—	<ul style="list-style-type: none"> • 0.1 mile of perennial streams • 5.3 miles of intermittent streams • 22.1 miles of sole source aquifer 	
	C815	0.9	7	4	0.8	0.1	—	—	—	<ul style="list-style-type: none"> • 0.2 mile of intermittent streams • 0.9 mile of sole source aquifer 	
	C814	1	8	5	—	1	—	—	—	<ul style="list-style-type: none"> • 0.2 mile of intermittent streams • 1 mile of sole source aquifer 	

Table H-5. Impact Levels for Earth Resources – Water

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	C816	0.1	1	1	—	0.1	—	—	—	• 0.1 mile of sole source aquifer	
	C812	3.3	26	17	0.5	2.8	—	—	—	• 0.4 mile of intermittent streams • 3.3 miles of sole source aquifer	
	C813	0.5	4	3	0.5	—	—	—	—	• 0.1 mile of intermittent streams • 0.5 mile of sole source aquifer	
	C810	2	16	10	0.2	1.8	—	—	—	• 0.9 mile of intermittent streams • 0.1 mile of perennial streams • 2 miles of sole source aquifer • 0.1 mile of waterbodies	
	C810a	1.7	14	9	—	1.7	—	—	—	• 0.2 mile of intermittent streams • 1.7 miles of sole source aquifer	
	C817	1.8	14	9	—	1.8	—	—	—	• 0.7 mile of intermittent streams • 1.8 miles of sole source aquifer	
	Local Alternative Links for 4C3										
	F40b-F51-F60a	11.1	88	63	4.5	6.6	—	—	—	• 5 miles of intermittent streams • 0.2 mile of perennial streams • 7.1 miles of sole source aquifer	
	F81a-F81b	32.2	255	135	26.2	6	—	—	—	• 4.1 miles of intermittent streams • 21.1 miles of perennial streams • 32.2 miles of sole source aquifer	
	C812	3.3	26	17	0.5	2.8	—	—	—	• Crosses 3.3 miles of sole source aquifer and 0.4 mile of intermittent streams	
	Local Alternative Links for 4C1, 4C2, 4C3										
	C72-C90-C121-C211	24.5	194	130	22.2	2.3	—	—	—	• 2.8 miles of perennial streams	
	Crossover Links for 4A, 4B, 4C1										
	C500	5.1	40	38	4.1	1	—	—	—	• 1 mile of intermittent streams	
	C501	4.8	38	32	4.2	0.6	—	—	—	• 0.8 mile of intermittent streams	
	C502	3.9	31	25	3.5	0.4	—	—	—	• 0.7 mile of intermittent streams	
	C174	3.1	25	22	2.7	0.4	—	—	—	• 0.5 mile of intermittent streams	
	Crossover Links for 4A, 4B, 4C1, 4C2										
	C671	7.9	63	48	7.3	0.6	—	—	—	• 1 mile of intermittent streams • 0.1 mile of wetlands	

*The ground disturbance is the estimated amount of potential temporary and permanent disturbance for the Project's two proposed 500 kV transmission lines and associated facilities.

Table H-6. Impact Levels for Vegetation Resources

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate? High	High		
Route Group 1: SunZia East Substation to Midpoint Substation	Subroute 1A – North River Crossing	219.5	1739	1196	48.2	110.9	56.4	4	—	<ul style="list-style-type: none"> Some cottonwoods would have to be removed at Rio Grande crossing High moderate impacts to riparian vegetation would be mitigated to moderate 	
	Subroute 1A1	228.8	1813	1238	56	125	45.5	2.3	—	<ul style="list-style-type: none"> Lower impacts than 1A to juniper savanna on Chupadera Mesa Remaining impacts would be similar to 1A 	
	Subroute 1A2 – BLM Preferred Alternative	230.3	1819	1270	55.7	121.2	51.1	2.3	—	<ul style="list-style-type: none"> Impacts would be similar to 1A1 	
	Subroute 1B – San Antonio Crossing										
	Subroute 1B1	223.6	1772	1189	68.4	96.1	52.8	6.3	—	<ul style="list-style-type: none"> Some cottonwoods would have to be removed at Rio Grande crossing High impacts to riparian vegetation would be mitigated to high-moderate 	
	Subroute 1B2	209.2	1657	1121	60.2	92.6	50.1	6.3	—	<ul style="list-style-type: none"> Some cottonwoods would have to be removed at Rio Grande crossing High impacts to riparian vegetation would be mitigated to high-moderate 	
	Subroute 1B3	206.3	1635	1106	59.7	92.5	47.8	6.3	—	<ul style="list-style-type: none"> Some cottonwoods would have to be removed at Rio Grande crossing High impacts to riparian vegetation would be mitigated to high-moderate 	
	Local Alternative and Crossover Links for Route Group 1										
	Local Alternative Links for 1A and 1B1 (Gran Quivira)										
	E81	21.7	172	120	0.2	14.7	7	—	—		
E82-E83-E84	33.5	345	99	0.5	30.2	2.8	—	—	<ul style="list-style-type: none"> Existing access along pipeline could result in a wide corridor of cleared vegetation 		
E85	7.2			—	6.7	0.5	—	—	<ul style="list-style-type: none"> Lowest impact to Chupadera Mesa 		

Table H-6. Impact Levels for Vegetation Resources

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate? High	High	
Route Group 1: SunZia East Substation to Midpoint Substation	Local Alternative Links for 1A, 1B1, 1B2, 1B3									
	A161b	18.6	147	109	—	3	18.8	—	—	
	A260	28.4	225	153	17.7	5.1	7.2	0.7	—	• Crosses areas with lower slopes
	A361-A430-A481	48	380	264	1.6	15.6	28.8	0.6	—	
	Crossover Links 1B2, 1B3									
Route Group 3: Midpoint Substation to Willow-500 kV Substation	A70	7.7	61	42	5	99	—	—	—	
	Subroute 3A – North	123.4	978	665	10.3	54.4	58.2	0.5	—	• Avoids sensitive plant species in Lordsburg Playa
	Subroute 3A2 – BLM Preferred Alternative	123.9	979	673	6.2	54.4	62.8	0.5	—	• Identical impacts to 3A.
	Subroute 3B – South	128.6	1019	638	31.8	58.9	37.2	0.7	—	Use of disturbed areas in the San Simon Valley reduces vegetation impacts compared to 3A
	Local Alternative and Crossover Links for Route Group 3									
	Crossover Links 3A, 3B									
	B111	6.9	55	35		6.9	—	—	—	• Use of 3B and B111 allows avoidance of Lordsburg Playa
B140	8.3	66	46		4.8	3.5	—	—	• Use of 3B and B140 allows avoidance of Lordsburg Playa	
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Subroute 4A – North of Mt. Graham	132.9	1053	778	34.6	32.4	56.9	9	—	• May impact Acuña cactus • Impact to riparian vegetation in Aravaipa watershed—mitigated to moderate impacts
	Subroute 4B – Sulphur Springs Valley	133	1054	793	34.6	22.4	66.6	9.4	—	• Large, intact grassland • Riparian impacts at Aravaipa Creek, San Pedro River mitigated to moderate impacts
	Subroute 4C									
	Subroute 4C1 – San Pedro Valley	139	1101	802	40.2	28.7	55.6	14.5	—	• Riparian impacts at San Pedro River mitigated to moderate impacts

Table H-6. Impact Levels for Vegetation Resources

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate? High	High		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Subroute 4C2 – San Pedro Valley	151.8	1203	870	45.6	39.8	58	8.4	—	<ul style="list-style-type: none"> Riparian habitat crossing San Pedro River similar to 4C1 (impacts mitigated to moderate), but 4C2 lacks disturbance associated with mine and planned transmission line 	
	Subroute 4C2c – West of San Pedro River – BLM Preferred Alternative	161.2	1277	928	46.5	39.9	67.6	7.2	—	<ul style="list-style-type: none"> Riparian impacts at San Pedro River mitigated to moderate impacts. Other impacts similar to 4C2 	
	Subroute 4C3 – Tucson	172.9	1370	892	91.6	28.9	47.6	4.8	—	<ul style="list-style-type: none"> Riparian impacts at San Pedro River and Cienega Creek mitigated to moderate impacts 	
	Local Alternative and Crossover Links for Route Group 4										
	Local Alternative Link for 4A, 4B, 4C1										
	C790	8.8	70	40	7.2	—	2.6	—	—	—	<ul style="list-style-type: none"> Slightly higher ground disturbance
	Local Alternative Links for 4A, 4B, 4C1, 4C2, 4C3										
	C860	6.9	55	36	3.9	3	—	—	—	—	
	C870	0.2	2	1	0.2	—	—	—	—	—	
	C890	2.8	22	11	2.8	—	—	—	—	—	
	Local Alternative Links for 4C1										
	C692	4.8	38	25	3.2	0.8	0.8	—	—	—	<ul style="list-style-type: none"> Lower total ground disturbance
	Local Alternative Links for 4C2 – Winchester and Tortolita Substations										
	C260-C261-C201	31	246	205	1.4	2.3	24.3	3.7	0.1	—	<ul style="list-style-type: none"> Driest of the four river crossings Increase in ground disturbance outweighs benefits
	C680	26.1	207	139	7.4	14.8	4	—	—	—	<ul style="list-style-type: none"> Increased total ground disturbance
	C815	0.9	7	4	0.9	—	—	—	—	—	
C814	1	8	5	1	—	—	—	—	—		
C816	0.1	1	1	0.1	—	—	—	—	—		
C812	3.3	26	17	2.4	—	12.9	—	—	—		
C813	0.5	4	3	0.5	—	—	—	—	—		

Table H-6. Impact Levels for Vegetation Resources

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate? High	High		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	C810	2	16	10	2	—	—	—	—		
	C810a	1.7	14	9	1.3	0.6	—	—	—		
	C817	1.8	14	9	1.8	—	—	—	—		
	Local Alternative Links for 4C3										
	F40b-F51-F60a	11.1	88	63	—	6.1	3.3	1.2	0.5	<ul style="list-style-type: none"> Increased erosion potential on steeper slopes near Cienega Creek 	
	F81a-F81b	32.2	255	136	13.8	1.4	1.3	—	—		
	C812	3.3	26	17	2.4	—	0.9	—	—		
	Local Alternative Links for 4C1, 4C2, 4C3										
	C72-C90-C121-C211	24.5	194	130	0.3	16.2	8.2	—	—		
	Crossover Links for 4A, 4B, 4C1										
	C500	5.1	40	38	—	—	0.4	4.7	—	<ul style="list-style-type: none"> San Manuel crossing of San Pedro River is preferred to Mammoth crossing 	
	C501	4.8	38	32	0.8	0.5	1	2.3	—		
	C502	3.9	31	25	0.4	0.8	0.8	1.9	—		
	C174	3.1	25	22	—	0.3	1	1.8	—	<ul style="list-style-type: none"> This subroute could be used with 4A or 4B to allow use of San Manuel crossing of San Pedro River instead of Mammoth crossing 	
Crossover Links for 4A, 4B, 4C1, 4C2											
C671	7.9	63	48	1.2	3.1	3.1	0.5	—	<ul style="list-style-type: none"> May add impacts to Acuña cactus 		

*The ground disturbance is the estimated amount of potential temporary and permanent disturbance for the Project's two proposed 500 kV transmission lines and associated facilities.

Table H-7. Impact Levels for Biological Resources – Threatened and Endangered Species

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 1: SunZia East Substation to Midpoint Substation	Subroute 1A – North River Crossing	219.5	1739	1196	146.8	8.7	64	—	—	<ul style="list-style-type: none"> • Crosses Bighorn Sheep movement corridor, although avoids ACEC • Crosses Southwestern Willow Flycatcher and Rio Grande Silvery Minnow critical habitat, riparian woodland • Impacts to waterfowl at Rio Grande crossing probably similar to San Antonio 	
	Subroute 1A1	228.8	1813	1238	156	9	63.8	—	—	<ul style="list-style-type: none"> • Impacts would be similar to 1A, but with a lower impact to Chupadera Mesa Bird Habitat Conservation Area 	
	Subroute 1A2 – BLM Preferred Alternative	230.3	1819	1270	51.7	9	63.8	—	—	<ul style="list-style-type: none"> • Impacts would be similar to 1A1 	
	Subroute 1B – San Antonio Crossing										
	Subroute 1B1	223.6	1772	1189	164.6	8.1	50.4	0.5	—	<ul style="list-style-type: none"> • Crosses Southwestern Willow Flycatcher and Rio Grande Silvery Minnow critical habitat, higher-quality riparian woodland than at North Crossing • All 1B subroutes avoid Fugate’s blue-star ACEC but likely cross habitat for species • Highest impact of 1B group due to greater ground disturbance 	
	Subroute 1B2	209.2	1657	1121	150.2	8.1	50.4	0.5	—	<ul style="list-style-type: none"> • Lowest impact to Chupadera Mesa Bird Habitat Conservation Area with existing access, narrower crossing 	
	Subroute 1B3	206.3	1635	1106	147.3	8.1	50.4	0.5	—	<ul style="list-style-type: none"> • Similar to 1B2, except as noted above 	
	Local Alternative and Crossover Links for Route Group 1										
	Local Alternative Links for 1A and 1B1 (Gran Quivira)										
	E81	21.7	172	120	21.7	—	—	—	—	—	<ul style="list-style-type: none"> • Impact similar to E80c
E82-E83-E84	33.5	345	99	33.5	—	—	—	—	—	<ul style="list-style-type: none"> • Lowest impact when compared to E81 or E80c 	

Table H-7. Impact Levels for Biological Resources – Threatened and Endangered Species

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 1: SunZia East Substation to Midpoint Substation	E85	7.2	74	24	7.2	—	—	—	—	
	Local Alternative Links for 1A, 1B1, 1B2, 1B3									
	A161b	18.6	147	109	18.6	—	—	—	—	<ul style="list-style-type: none"> • Crosses portion of Bighorn Sheep movement corridor • Not preferred
	A260	28.4	225	153	22.8	.3	5.3	—	—	<ul style="list-style-type: none"> • Slightly preferable to A270
	A361-A430-A481	48	380	264	33.2	2.3	12.5	—	—	May create additional collision hazard for Sandhill Cranes in Uvas Valley
	Crossover Links 1B2, 1B3									
A70	7.7	61	42	7.7	—	—	—	—	<ul style="list-style-type: none"> • Use of 1B2 and A70 crossover may be most preferable route biologically 	
Route Group 3: Midpoint Substation to Willow-500 kV Substation	Subroute 3A – North	123.4	978	665	45.1	8.2	70.1	—	—	<ul style="list-style-type: none"> • Avoids sensitive plant and invertebrate habitat in Lordsburg Playa • Avoids collision risk to wintering migratory birds at Lordsburg Playa
	Subroute 3A2 – BLM Preferred Alternative	123.9	979	673	42.1	7.9	70.9	—	—	<ul style="list-style-type: none"> • Identical impacts to 3A
	Subroute 3B – South	128.6	1019	638	62.3	42	24.3	—	—	<ul style="list-style-type: none"> • Use of disturbed habitat in San Simon Valley reduces new ground disturbance compared to 3A • Collision risk for migratory birds would be increased at Lordsburg Playa
	Local Alternative and Crossover Links for Route Group 3									
	Crossover Links 3A, 3B									
	B111	6.9	55	35		0.3	6.6	—	—	<ul style="list-style-type: none"> • No preference; eastern portion of 3A-3B would have similar impacts
B140	8.3	66	46	8.3	—	—	—	—	<ul style="list-style-type: none"> • Preferable to continuing on with 3B • Allows avoidance of Lordsburg Playa 	

Table H-7. Impact Levels for Biological Resources – Threatened and Endangered Species

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Subroute 4A – North of Mt. Graham	132.9	1053	778	32.1	57.6	42.3	0.9	—	<ul style="list-style-type: none"> • Preferable to 4B; avoids impacts to Sulphur Springs Valley • 4C subroutes are generally preferable to 4A and 4B to avoid Aravaipa Creek watershed and unfragmented habitat in Galiuro Mountains 	
	Subroute 4B – Sulphur Springs Valley	133	1054	793	53.7	45.9	32.5	0.9	—	<ul style="list-style-type: none"> • Impacts large, unfragmented grassland in Sulphur Springs Valley • Temporary disturbance would affect intensively managed Pronghorn population • Impacts habitat for Arizona Striped Whiptail 	
	Subroute 4C										
	Subroute 4C1 – San Pedro Valley	139	1101	802	43.9	53.6	39.7	1.8	—	<ul style="list-style-type: none"> • Crosses critical habitat for several fish species, although streams can be spanned • Crosses much Desert Tortoise habitat, including long-term monitoring plot • Crosses San Pedro River parallel to planned transmission line, which decreases bird collision risk 	
	Subroute 4C2 – San Pedro Valley	151.8	1203	870	36.5	75	38.7	1.6	—	<ul style="list-style-type: none"> • Preferable to 4C1, as it avoids fish critical habitat and uses more existing access; other impacts are similar • River crossing is lower quality riparian habitat, but lacks existing or planned transmission lines 	
	Subroute 4C2c – West of San Pedro River – BLM Preferred Alternative	161.2	1277	928	34.4	79.3	45.1	2.4	—	<ul style="list-style-type: none"> • Would be located near existing lines crossing the San Pedro River • Other impacts are similar to 4C2 	

Table H-7. Impact Levels for Biological Resources – Threatened and Endangered Species

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Subroute 4C3 – Tucson	172.9	1370	892	35.6	95.2	36	6.1	—	<ul style="list-style-type: none"> • Preferable. Crosses Gila Chub critical habitat in Cienega Creek, although it can be spanned • May cross Pima pineapple cactus habitat, although largely in disturbed areas • Extensive urbanization has eliminated much natural habitat when compared to 4C1 and 4C2 	
	Local Alternative and Crossover Links for Route Group 4										
	Local Alternative Link for 4A, 4B, 4C1										
	C790	8.8	70	40	5.5	0.7	2.6	—	—	• No preference	
	Local Alternative Links for 4A, 4B, 4C1, 4C2, 4C3										
	C860	6.9	55	36	0.6	3.3	3	—	—	• C860-C890 maximizes distance from waterfowl habitat at Picacho Reservoir	
	C870	0.2	2	1	—	0.2	—	—	—	• Beneficial if used to bypass Link C880	
	C890	2.8	22	11	—	2.8	—	—	—	• See above	
	Local Alternative Links for 4C1										
	C692	4.8	38	25	—	4	0.8	—	—	• Increases ground disturbance with no other benefit	
	Local Alternative Links for 4C2 – Winchester and Tortolita Substations										
	C260-C261-C201	31	246	205	—	8.2	22.8	—	—	<ul style="list-style-type: none"> • Not preferred • River crossing is lowest sensitivity on San Pedro River, but would require much additional ground disturbance 	
	C680	26.1	207	139	3.1	19.7	3.3	—	—	<ul style="list-style-type: none"> • Probably not preferred, as ground disturbance would be increased • Tucson Shovel-nosed Snake habitat would be impacted 	
	C815	0.9	7	4	0.8	0.1	—	—	—	• No clear preference for any of links 810-818	
	C814	1	8	5	—	1	—	—	—		

Table H-7. Impact Levels for Biological Resources – Threatened and Endangered Species

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	C816	0.1	1	1	—	0.1	—	—	—		
	C812	3.3	26	17	—	2.4	0.9	—	—		
	C813	0.5	4	3	—	0.5	—	—	—		
	C810	2	16	10	—	2	—	—	—		
	C810a	1.7	14	9	—	1.4	0.3	—	—		
	C817	1.8	14	9	—	1.8	—	—	—		
	Local Alternative Links for 4C3										
	F40b-F51-F60a	11.1	88	63	—	5.8	5.3	—	—	<ul style="list-style-type: none"> • Higher biological impact than Link F600 • More extensive impacts to Cienega Creek as well as Agua Verde Creek 	
	F81a-F81b	32.2	255	136	3	23.2	4.7	1.3	—	<ul style="list-style-type: none"> • Preferable to F80-F111-F112, as it avoids waterfowl habitat near Roger Road wastewater treatment plant 	
	C812	3.3	26	17	—	2.4	0.9	—	—		
	Local Alternative Links for 4C1, 4C2, 4C3										
	C72-C90-C121-C211	24.5	194	130	4	7.1	0.2	—	—	<ul style="list-style-type: none"> • Link C110 is preferable, as it avoids Arizona Striped Whiptail habitat 	
	Crossover Links for 4A, 4B, 4C1										
	C500	5.1	40	38	—	0.4	4.7	—	—	<ul style="list-style-type: none"> • No clear preference for any of these crossover links • San Manuel River crossing is preferred to Mammoth crossing 	
	C501	4.8	38	32	—	1.6	3.2	—	—		
	C502	3.9	31	25	—	2	1.9	—	—		
	C174	3.1	25	22	—	1.3	1.8	—	—		
	Crossover Links for 4A, 4B, 4C1, 4C2										
	C671	7.9	63	48	—	3.6	4.3	—	—	<ul style="list-style-type: none"> • Not preferred • This link would increase total disturbance, and possibly add impacts to Acuña cactus that would not otherwise be present in the 4C subroute group 	

*The ground disturbance is the estimated amount of potential temporary and permanent disturbance for the Project’s two proposed 500 kV transmission lines and associated facilities.

Table H-8. Impact Levels for Cultural Resources

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Level (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 1: SunZia East Substation to Midpoint Substation	Subroute 1A – North River Crossing	219.5	1739	1196	0.7	0.1	21.8	0.9	0.3	<ul style="list-style-type: none"> • Crosses El Camino Real, Butterfield, Gila, and Crooke trails • Impacts habitation site LA45162 	
	Subroute 1A1	228.8	1813	1238	0.7	0.4	21.6	0.9	0.3	<ul style="list-style-type: none"> • Crosses El Camino Real, Butterfield, Gila, and Crooke trails • Impacts habitation sites LA45163 and LA50766 	
	Subroute 1A2 – BLM Preferred Alternative	230.3	1819	1270	1	0.4	21.6	0.9	0.3	<ul style="list-style-type: none"> • See Chapter 4 for a description of impacts to BLM preferred alternative. Impacts are similar to Subroute 1A1. 	
	Subroute 1B – San Antonio Crossing										
	Subroute 1B1	223.6	1772	1189	0.7	—	18.8	0.6	0.4	<ul style="list-style-type: none"> • Crosses El Camino Real, Butterfield, Gila and Crooke trails • Impacts habitation site LA45162 	
	Subroute 1B2	209.2	1657	1121	0.7	0.7	18.6	0.6	0.4	<ul style="list-style-type: none"> • Crosses El Camino Real, Butterfield, Gila and Crooke trails • Impacts habitation site LA45162 • Visual Cultural Impact: Less than 1 mile from Playas Pueblo Arch District 	
	Subroute 1B3	206.3	1635	1106	0.8	0.7	18.2	2.8	0.4	<ul style="list-style-type: none"> • Worst of Route Group 1 • Crosses El Camino Real, Butterfield, Gila and Crooke (twice) trails • Impacts Mockingbird Gap Arch District 	
	Local Alternative and Crossover Links for Route Group 1										
	Local Alternative Links for 1A and 1B1 (Gran Quivira)										
	E81	21.7	172	120	—	—	—	—	—	<ul style="list-style-type: none"> • Visual Cultural Impact: Less than 1.5 miles from Gran Quivira 	
	E82-E83-E84	33.5	345	99	—	—	—	—	—	<ul style="list-style-type: none"> • Visual Cultural Impact: Less than 1.5 miles from Gran Quivira 	
	E85	7.2	74	24	—	—	—	—	—	<ul style="list-style-type: none"> • Visual Cultural Impact: Less than 1 mile from Seco Ruins 	

Table H-8. Impact Levels for Cultural Resources

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Level (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 1: SunZia East Substation to Midpoint Substation	Local Alternative Links for 1A, 1B1, 1B2, 1B3									
	A161b	18.6	147	109	—	—	0.3	—	—	• Low impacts (moderate density site impacted)
	A260	28.4	225	153	—	0.3	—	—	—	• Low impacts (low density site impacted)
	A361-A430-A481	48	380	264	—	0.1	0.1	0.1	—	• Crosses Gila, Butterfield and Crooke’s trails
	Crossover Links 1B2, 1B3									
A70	7.7	61	42	—	—	—	—	—	—	• No impacts
Route Group 3: Midpoint Substation to Willow-500 kV Substation	Subroute 3A – North	123.4	978	665	0.4	0.1	2	0.4	0.7	• Crosses Gila, Butterfield, Janos Copper, and CDNST trails
	Subroute 3A2 – BLM Preferred Alternative	123.9	979	673	0.6	0.2	1.2	0.2	0.7	• See Chapter 4 for a description of impacts to BLM preferred alternative. Impacts similar to Subroute 3A.
	Subroute 3B – South	128.6	1019	638	0.5	0.3	3.2	0.3	—	• Worst of Route Group 3 • Crosses Crooke, Janos Copper, CDNST, Gila (3 times) and Butterfield trails
	Local Alternative and Crossover Links for Route Group 3									
	Crossover Links 3A, 3B									
B111	6.9	55	35	—	—	0.1	0.1	—	—	• Crosses Butterfield, Gila, and CDNST trails
B140	8.3	66	46	—	0.3	—	0.1	—	—	• Crosses Butterfield Trail

Table H-8. Impact Levels for Cultural Resources

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Level (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Subroute 4A – North of Mt. Graham	132.9	1053	778	0.5	0.2	4	1.1	0.1	<ul style="list-style-type: none"> • Crosses Southern Pacific Mail Line, Butterfield and Zuniga trails • Visual Cultural Impact: Less than 1.5 miles from Oak Draw Arch District and Marijilda Canyon Arch District 	
	Subroute 4B – Sulphur Springs Valley	133	1054	793	0.2	—	3	0.8	—	<ul style="list-style-type: none"> • Crosses Southern Pacific Mail Line, Butterfield, and Zuniga trails 	
	Subroute 4C										
	Subroute 4C1 – San Pedro Valley	139	1101	802	0.6	0.6	3.9	0.3	0.3	<ul style="list-style-type: none"> • Crosses Southern Pacific Mail Line, Butterfield, and Zuniga trails • Impacts habitation site AZ BB:6:2(ASM) 	
	Subroute 4C2 – San Pedro Valley	151.8	1203	870	0.4	0.3	4.5	0.2	0.1	<ul style="list-style-type: none"> • Crosses Southern Pacific Mail Line, Butterfield, and Zuniga trails • Visual Cultural Impact: Less than 0.25 mile from McClellan Wash Arch District 	
	Subroute 4C2c – West of San Pedro River – BLM Preferred Alternative	161.2	1277	928	0.4	0.5	3.8	0.2	0.1	<ul style="list-style-type: none"> • See Chapter 4 for a description of impacts to BLM preferred alternative. 	
	Subroute 4C3 – Tucson	172.9	1370	892	0.8	2.2	16.1	1.9	1.6	<ul style="list-style-type: none"> • Worst of Route Group 4 • Crosses Butterfield (7), Gila (3), Crooke (5), Zuniga (3), De Anza (4), and Southern Mail (1) trails • Impacts habitation sites AZ BB:13:17(ASM), AZ EE:2:44(ASM), AZ AA:12:46(ASM), AZ AA:12:246(ASM) • Impacts Silverbell Nominated site • Visual Cultural Impact: Less than 0.25 mile from McClellan Wash Arch District 	
	Local Alternative and Crossover Links for Route Group 4										
	Local Alternative Link for 4A, 4B, 4C1										
	C790	8.8	70	40	4	—	0.1	—	—	<ul style="list-style-type: none"> • Low to moderate impacts 	

Table H-8. Impact Levels for Cultural Resources

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Level (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Local Alternative Links for 4A, 4B, 4C1, 4C2, 4C3									
	C860	6.9	55	36	0.2	—	—	0.4	—	• Crosses the Southern Pacific Mail Route
	C870	0.2	2	1	—	—	—	—	—	• No impacts
	C890	2.8	22	11	—	—	—	—	—	• No impacts
	Local Alternative Links for 4C1									
	C692	4.8	38	25	—	—	—	—	0.6	• Impacts to habitation site AZ AA:8:21 (ASM)
	Local Alternative Links for 4C2 – Winchester and Tortolita Substations									
	C260-C261-C201	31	246	205	—	0.2	0.3	—	—	• Low impacts (low density site impacted)
	C680	26.1	207	139	0.4	0.1	0.5	0.1	—	• Low to moderate impacts (impacts several low and moderate sites)
	C815	0.9	7	4	—	—	—	—	—	• No impacts
	C814	1	8	5	—	—	—	—	—	• No impacts
	C816	0.1	1	1	—	—	—	—	—	• No impacts
	C812	3.3	26	17	—	—	—	—	—	• No impacts
	C813	0.5	4	3	—	—	—	—	—	• No impacts
	C810	2	16	10	—	—	—	—	—	• No impacts
	C810a	1.7	14	9	—	—	0.1	—	—	• Low impacts
	C817	1.8	14	9	—	—	0.1	—	—	• No impacts
	Local Alternative Links for 4C3									
	F40b-F51-F60a	11.1	88	63	—	—	0.9	0.1	—	• Crosses Butterfield Trail • Visual Cultural Impact: Less than 1 mile from Colossal Cave Mt. Park
	F81a-F81b	32.2	255	136	0.1	0.2	3.7	0.8	0.6	• Crosses Butterfield (2), De Anza, Zuniga, and Croke trails • Impacts Ft Lowell Multiple Property District and Rillito Race Track District • Impacts Prudence, Nominated site
	C812	3.3	26	17	—	—	—	—	—	• No impacts

Table H-8. Impact Levels for Cultural Resources

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Level (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Local Alternative Links for 4C1, 4C2, 4C3									
	C72-C90-C121-C211	24.5	194	130	—	—	—	—	—	• No impacts
	Crossover Links for 4A, 4B, 4C1									
	C500	5.1	40	38	—	—	—	—	—	• No impacts
	C501	4.8	38	32	—	—	—	—	—	• No impacts
	C502	3.9	31	25	—	—	—	—	—	• No impacts
	C174	3.1	25	22	—	—	—	—	—	• No impacts
	Crossover Links for 4A, 4B, 4C1, 4C2									
C671	7.9	63	48	—	—	—	—	—	• No impacts	

*The ground disturbance is the estimated amount of potential temporary and permanent disturbance for the Project's two proposed 500 kV transmission lines and associated facilities.

Table H-9. Impact Levels for Visual – Scenic Quality Resource

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 1: SunZia East Substation to Midpoint Substation	Subroute 1A – North River Crossing	219.5	1739	1196	35.8	55.6	102.6	25.5	—	<ul style="list-style-type: none"> The majority of this route crosses Class B scenery E180: Crosses Class A scenery associated with the Rio Grande; this is the only Class A scenery crossed by this route group Southern half of route (Link A330a south, to Midpoint Substation) would parallel existing transmission lines crossing Class B scenery (Rio Grande Valley) and Class C scenery (valley plains) 	
	Subroute 1A1 –	228.8	1813	1238	35.8	75.4	95.9	21.7	—	<ul style="list-style-type: none"> Where this subroute diverges from 1A (links E85, E84b, E84a, E82) this route crosses Class B scenery, including juniper mountains Impacts are mostly low /moderate or moderate 	
	Subroute 1A2 – BLM Preferred Alternative	230.3	1819	1270	35.8	75.4	87.7	31.4	—	<ul style="list-style-type: none"> Where this subroute diverges from 1A (links E) this route crosses Class B scenery including juniper mountains Impacts are primarily low/moderate to moderate. 	
	Subroute 1B – San Antonio Crossing										
	Subroute 1B1	223.6	1772	1189	31	69.8	103	19.8	—	<ul style="list-style-type: none"> Where routes diverge north of White Sands Missile Range, Subroute 1B1 crosses more Class C scenery (valley plains) Most of Link E90 parallels an existing road 	
Subroute 1B2	209.2	1657	1121	31	68.1	91.3	18.8	—	<ul style="list-style-type: none"> Where this subroute diverges from 1B1 (links A30, A50, and A60), it crosses similar Class B and C scenery Crosses less Class B scenery than 1B1; however, the landscape appears more natural with less cultural modifications such as roads 		

Table H-9. Impact Levels for Visual – Scenic Quality Resource

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 1: SunZia East Substation to Midpoint Substation	Subroute 1B3	206.3	1635	1106	31	62.9	91.4	21	—	<ul style="list-style-type: none"> Where this subroute diverges from 1B2 (links A40, A41, and A80), it crosses similar Class B and C scenery for approximately the same amount of distance/mileage Link A41 parallels an existing road through Class B scenery associated with rolling savanna plains. Portions of links A50 and A60 (in Subroute 1B2) through similar Class B scenery do not parallel existing roads	
	Local Alternative and Crossover Links for Route Group 1										
	Local Alternative Links for 1A and 1B1 (Gran Quivira)										
	E81	21.7	172	120	—	—	19.8	1.9	—		
	E82-E83-E84b-E84a	33.5	345	99	—	—	33.5	—	—	<ul style="list-style-type: none"> The portions of links E82 and E83 crossing Class B scenery associated with rolling juniper-savanna would parallel and existing pipeline route. Juniper stands have already been cleared and created existing contrast within the landscape 	
	E85	7.2	74	24	—	—	5.6	1.6	—		
	Local Alternative Links for 1A, 1B1, 1B2, 1B3										
	A161b	18.6	147	109	—	—	15.3	3.3	—	<ul style="list-style-type: none"> Very limited opportunities to use existing access in Class B scenery including the Rio Grande Valley, bajadas and foothills of the Magdalena Mountains The majority of the link would require new access 	
	A260	28.4	225	153	—	19.8	7.9	0.7	—	<ul style="list-style-type: none"> Parallels an existing 115 kV transmission line for a majority of the link Approximately 9.4 miles is located within the DOE West Wide Corridor 	

Table H-9. Impact Levels for Visual – Scenic Quality Resource

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 1: SunZia East Substation to Midpoint Substation	A361-A430-A481	48	380	264	—	36.3	8.9	2.8	—	<ul style="list-style-type: none"> • Crosses mostly Class C scenery associated with desert valley plains • These links do not parallel existing transmission lines or major transportation routes like subroutes 1A and 1B 	
	Crossover Links 1B2, 1B3										
	A70	7.7	61	42	—	1.7	5.4	0.6	—	<ul style="list-style-type: none"> • Similar to Subroute 1B2 	
Route Group 3: Midpoint Substation to Willow-500 kV Substation	Subroute 3A – North	123.4	978	665	39.2	81.1	2.5	0.6	—	<ul style="list-style-type: none"> • Majority of route crosses Class C scenery associated with valley plains • Impacts are mostly low-moderate and low • Approximately 1/3 of the route parallels existing transmission lines • Only Class B scenery crossed is associated with low rolling bajadas and the foothills of the Peloncillo Mountains (Link 160a) 	
	Subroute 3A2 – BLM Preferred Alternative	123.9	979	673	39.2	81.6	2.5	0.6	—	<ul style="list-style-type: none"> • Majority of route crosses Class C scenery associated with valley plains. • Impacts are mostly low-moderate and low. • Class B scenery crossed is associated with low rolling bajadas and the foothills of the Peloncillo Mountains (Link B160a). 	
	Subroute 3B – South	128.6	1019	638	1.7	119.5	5.3	2.1	—	<ul style="list-style-type: none"> • Crosses slightly more Class B scenery (associated with foothills of the Pyramid and Peloncillo Mountains) than Subroute 3A • Where this route crosses Class B scenery it is paralleling an existing pipeline route (Peloncillo foothills) or the landscape setting has been modified by mining operations, pipeline routes (which would cross Link B112) and other development associated with Lordsburg • Parallels a portion of the DOE West Wide Corridor 	

Table H-9. Impact Levels for Visual – Scenic Quality Resource

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 3: Midpoint Substation to Willow-500 kV Substation	Local Alternative and Crossover Links for Route Group 3									
	Crossover Links 3A, 3B									
	B111	6.9	55	35	6.9	—	—	—	—	<ul style="list-style-type: none"> Parallels an existing 115 kV transmission line within Class C scenery associated with valley plains This link has lower overall impacts than Link B140
	B140	8.3	66	46	—	—	8.3	—	—	<ul style="list-style-type: none"> Crosses Class C scenery associated with valley plains but it does not parallel existing utilities
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Subroute 4A – North of Mt. Graham	132.9	1053	778	11.9	23.1	56.6	41.2	—	<ul style="list-style-type: none"> Crosses mostly high quality Class B scenery (Sky Island Transitional Foothills, San Pedro River Valley, and Sonoran Palo Verde Valley) Only Class A scenery crossed by this subroute is associated with the San Pedro River and Riparian area Only a small portion of the subroute parallels or is crossed by existing utilities (typically in Class C scenery at the far east and west ends of the route (B153a, C880))
	Subroute 4B – Sulphur Springs Valley	133	1054	793	5.7	34.3	47.3	45.6	—	<ul style="list-style-type: none"> Crosses similar Class C scenery to 4A, however, where this subroute diverges from 4A, it does not parallel existing utilities
	Subroute 4C									
	Subroute 4C1 – San Pedro Valley	139	1101	802	16.9	21.6	63.1	35.2	2.1	<ul style="list-style-type: none"> Crosses mostly Class B scenery, including the San Pedro River Valley (east side of the valley) Crosses Class A scenery associated with Desert Canyons, and the San Pedro River and Riparian There is more evidence of cultural modification within the San Pedro River/Riparian where this route would cross than the 4A crossing In addition, this route crossing would be adjacent to the San Manuel Copper Mine Complex A good portion of this subroute east and west of the San Pedro Valley parallels existing utilities (transmission lines and pipelines)

Table H-9. Impact Levels for Visual – Scenic Quality Resource

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
										<ul style="list-style-type: none"> It does not parallel existing utilities within the San Pedro River Valley and there is limited existing access
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Subroute 4C2 – San Pedro Valley	151.8	1203	870	31	37.4	52.8	30.5	—	<ul style="list-style-type: none"> Crosses the west side of the San Pedro River Valley, where it would parallel an existing pipeline along Link C450 There is more existing access along the west side than 4C1 Crosses Class A scenery associated with the San Pedro River and Riparian Crosses similar Class B and C scenery to Subroute 4C1 Link C680 parallels existing transmission line(s) through Class B scenery, where Subroute 4C1 parallels a pipeline
	Subroute 4C2c – West San Pedro River – BLM Preferred Alternative	161.2	1277	928	39.6	41.8	51.1	28.7	—	<ul style="list-style-type: none"> See Chapter 4 for a description of impacts to BLM preferred alternative.
	Subroute 4C3 – Tucson	172.9	1370	892	62.7	48.1	29.4	5.6	—	<ul style="list-style-type: none"> From where it diverges from Subroute 4C1, south of the San Pedro River Valley and Rincon Mountains, this route would parallel existing transmission lines through primarily Class B scenery Crosses Class A scenery associated with the San Pedro River/Riparian and the Cienega Creek Preserve There are existing transmission lines at the San Pedro River crossing and existing cultural modifications (pipeline, railroad, road, and trails) at the Cienega Creek Crossing

Table H-9. Impact Levels for Visual – Scenic Quality Resource

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Local Alternative and Crossover Links for Route Group 4									
	Local Alternative Link for 4A, 4B, 4C1									
	C790	8.8	70	40	—	4.4	4.4	—	—	• Similar impacts as Subroute 4A
	Local Alternative Links for 4A, 4B, 4C1, 4C2, 4C3									
	C860	6.9	55	36	—	6	0.8	—	—	• Crosses similar Class C scenery with similar impacts to Subroute 4C1
	C870	0.2	2	1	—	0.2	—	—	—	• Crosses Class C scenery adjacent to agricultural lands
	C890	2.8	22	11	0.9	0.3	1.6	—	—	• Crosses Class B scenery associated with agricultural lands • A portion of the link parallels an existing pipeline, roadway, and 500 kV transmission line
	Local Alternative Links for 4C1									
	C692	4.8	38	25	—	—	4.8	—	—	• Does not parallel existing pipeline(s) like Link C691 of Subroute 4C1
	Local Alternative Links for 4C2 – Winchester and Tortolita Substations									
	C260-C261-C201	31	246	205	8.5	7.8	3.3	11.4	—	• Impacts along Links C260 and C261 are identical to impacts along Subroute 4C3 • There is no existing access along Link C201 where it crosses steeper terrain associated with the Rincon Mountains
	C680	26.1	207	139	14.1	9.8	1.8	0.4	—	• Almost the entire link parallels existing transmission lines (500 kV and 115 kV) through Class B scenery
	C815	0.9	7	4	—	—	0.9	—	—	• Similar impacts as Subroute 4C2
	C814	1	8	5	1	—	—	—	—	• Similar impacts as Subroute 4C2
	C816	0.1	1	1	—	—	0.1	—	—	• Impacts are identical to impacts anticipated along Subroute 4C3
	C812	3.3	26	17	—	1.5	1.4	—	—	• Impacts are identical to impacts anticipated along Subroute 4C3
C813	0.5	4	3	—	—	0.5	—	—	• Impacts are identical to impacts anticipated along Subroute 4C3	

Table H-9. Impact Levels for Visual – Scenic Quality Resource

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	C810	2	16	10	1.9	—	—	—	—	<ul style="list-style-type: none"> Impacts are identical to impacts anticipated along Subroute 4C3 Parallels existing transmission lines (500 kV and 115 kV) 	
	C810a	1.7	14	9	1.7	—	—	—	—	<ul style="list-style-type: none"> Impacts are identical to impacts anticipated along Subroute 4C3 	
	C817	1.8	14	9	—	—	1.8	—	—	<ul style="list-style-type: none"> Crosses Class B scenery and does not parallel any linear utilities 	
	Local Alternative Links for 4C3										
	F40b-F51-F60a	11.1	88	63	5.2	2.9	1.8	0.7	—	<ul style="list-style-type: none"> Link F40B parallels two 345 kV transmission lines F51 crosses Class A scenery associated with the Cienega Creek Preserve Although more Class A would be crossed by this subroute overall impacts are anticipated to be lower than Subroute 4C3 due to the presence of two existing 345 kV transmission lines located to the north of the proposed route 	
	F81a-F81b	32.2	255	136	5.4	3.5	0.6	—	—	<ul style="list-style-type: none"> Parallels an existing transmission line and is adjacent to development associated with the Tucson Metropolitan Area 	
	C812	3.3	26	17	—	1.5	1.4	—	—	<ul style="list-style-type: none"> Crosses Class B and C scenery Anticipated to have higher impacts than Link C810 of Subroute 4C3 	
	Local Alternative Links for 4C1, 4C2, 4C3										
	C72-C90-C121-C211	24.5	194	130	3	13.1	5.8	2.6	—	<ul style="list-style-type: none"> Crosses similar Class B and C scenery as Subroute 4C1, 2, and 3 Links C90 and C121 do not parallel existing transmission lines (like Link C110 in the 4C1, 2, and 3) Link C72 and C211 parallel two existing 345 kV transmission lines in Class B scenery 	
	Crossover Links for 4A, 4B, 4C1										
C500	5.1	40	38	—	—	0.4	4.7	—	<ul style="list-style-type: none"> Crosses Class B scenery associated with the San Pedro River Valley and has similar impacts as Subroute 4C1 		

Table H-9. Impact Levels for Visual – Scenic Quality Resource

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	C501	4.8	38	32	—	—	2	2.8	—	<ul style="list-style-type: none"> Crosses Class B scenery associated with the San Pedro River Valley and has similar impacts as Subroute 4C1
	C502	3.9	31	25	—	—	1.9	2	—	<ul style="list-style-type: none"> Crosses Class B scenery associated with the San Pedro River Valley and has similar impacts as Subroute 4C1
	C174	3.1	25	22	—	—	1.3	1.8	—	<ul style="list-style-type: none"> Crosses Class B scenery associated with the San Pedro River Valley and has similar impacts as Subroute 4C1
	Crossover Links for 4A, 4B, 4C1, 4C2									
	C671	7.9	63	48	—	—	5.6	2.3	—	<ul style="list-style-type: none"> Located near Tiger Mine

*The ground disturbance is the estimated amount of potential temporary and permanent disturbance for the Project's two proposed 500 kV transmission lines and associated facilities.

Table H-10. Impact Levels for Visual Resources – Sensitive Viewers (Composite)

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 1: SunZia East Substation to Midpoint Substation	Subroute 1A – North River Crossing	219.5	1739	1196	50.2	84.2	37.6	23.7	23.8	<ul style="list-style-type: none"> Residential viewers north of Socorro (E180) Recreational viewers north of Socorro (E101b, E133, E180) 	
	Subroute 1A1	228.8	1813	1238	46.7	94.8	42.1	28.6	16.6	<ul style="list-style-type: none"> Residential viewers north of Socorro (E180) Recreation viewers north of Socorro (E101b, E133, E180) Recreation viewers associated with Gran Quivira (E84b, E85) 	
	Subroute 1A2 – BLM Preferred Alternative	230.3	1819	1270	38.7	95.5	46.8	33	16.3	<ul style="list-style-type: none"> Residential viewers north of Socorro (E180) Recreation viewers north of Socorro (E101b, E133, E180) Recreation viewers associated with Gran Quivira 	
	Subroute 1B – San Antonio Crossing										
	Subroute 1B1	223.6	1772	1189	48.3	109.1	37.1	16.3	12.8	<ul style="list-style-type: none"> Residential viewers north of San Antonio (A140) 	
	Subroute 1B2	209.2	1657	1121	26.7	109.1	42.8	17.7	12.9		
	Subroute 1B3	206.3	1635	1106	39.9	93.9	40.7	17.7	14.1	<ul style="list-style-type: none"> Residential viewers near Bingham (A41) 	
	Local Alternative and Crossover Links for Route Group 1										
	Local Alternative Links for 1A and 1B1 (Gran Quivira)										
	E81	21.7	172	120	6.7	10.8	1.6	2.6	—		
	E82-E83-E84b-E84a	33.5	345	99	1.7	23.5	2.9	3.4	2	<ul style="list-style-type: none"> Salt Missions Scenic Byway crossings (E84b, E83) 	
	E85	7.2	74	24	7.2	—	—	—	—		
	Local Alternative Links for 1A, 1B1, 1B2, 1B3										
	A161b	18.6	147	109	—	2.3	11	4.3	1	<ul style="list-style-type: none"> Dispersed residential viewers 	
	A260	28.4	225	153	2.2	13	5.8	6.3	1.1		
	A361-A430-A481	48	380	264	17.7	20.9	5.9	2.4	1.1	<ul style="list-style-type: none"> Residential viewers (A430) 	
	Crossover Links 1B2, 1B3										
	A70	7.7	61	42	—	6.5	0.8	—	0.4	<ul style="list-style-type: none"> Residential viewers near Bingham 	

Table H-11. Impact Levels for Existing Land Use and Special Management Areas

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High	
	Subroute 4C2 – San Pedro Valley	151.8	1203	870	76.1	75.7	—	—	—	<ul style="list-style-type: none"> • Crosses agricultural and residential properties (Link C110) • Crosses Pima County-managed Preserved Lands (Six Bar Ranch-Link A450 and A7 Ranch-links C276 and C441)
	Subroute 4C2c – West of San Pedro River – BLM Preferred Alternative	161.2	1277	928	79	82.2	—	—	—	<ul style="list-style-type: none"> • Crosses agricultural and residential properties (Link C110) • Crosses Pima County-managed Preserved Lands (Six Bar Ranch-Link A450 and A7 Ranch-links C441)
	Subroute 4C3 – Tucson	172.9	1370	892	95.2	69.2	5.8	0.1	2.6	<ul style="list-style-type: none"> • Crosses agricultural and residential properties (Link C110) • Crosses Residential Properties (F111)
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Local Alternative and Crossover Links for Route Group 4									
	Local Alternative Link for 4A, 4B, 4C1									
	C790	8.8	70	40	6.2	2.6	—	—	—	• No significant impacts
	Local Alternative Links for 4A, 4B, 4C1, 4C2, 4C3									
	C860	6.9	55	36	3.9	3	—	—	—	• No significant impacts
	C870	0.2	2	1	0.2	—	—	—	—	• No significant impacts
	C890	2.8	22	11	0.3	2.5	—	—	—	• No significant impacts
	Local Alternative Links for 4C1									
	C692	4.8	38	25	4	0.8	—	—	—	• No significant impacts
	Local Alternative Links for 4C2 – Winchester and Tortolita Substations									
	C260-C261-C201	31	246	205	4.5	26.5	—	—	0.2	• No significant impacts
	C680	26.1	207	139	23.2	2.9	—	—	—	• No significant impacts
	C815	0.9	7	4	0.9	—	—	—	—	• No significant impacts
	C814	1	8	5	1	—	—	—	—	• No significant impacts
	C816	0.1	1	1	0.1	—	—	—	—	• No significant impacts
C812	3.3	26	17	2.4	0.9	—	—	—	• No significant impacts	
C813	0.5	4	3	0.5	—	—	—	—	• No significant impacts	
C810	2	16	10	2	—	—	—	—	• No significant impacts	

Table H-11. Impact Levels for Existing Land Use and Special Management Areas

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
	C810a	1.7	14	9	1.3	0.4	—	—	—	• No significant impacts	
	C817	1.8	14	9	1.8	—	—	—	—	• No significant impacts	
	Local Alternative Links for 4C3										
	F40b-F51-F60a	11.1	88	63	5.2	4.3	—	—	1.6	• Crosses Pima County Managed Land	
	F81a-F81b	32.2	255	136	18.8	2	6.2	—	5.2	• Crosses Pima County Managed Land	
	C812	3.3	26	17	2.4	0.9	—	—	—	• No significant impacts (DUPLICATE)	
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Local Alternative Links for 4C1, 4C2, 4C3										
	C72-C90-C121-C211	24.5	194	130	10.3	13.1	1.1	—	—	• Crosses center pivot agricultural land and residential property (Link C121)	
	Crossover Links for 4A, 4B, 4C1										
	C500	5.1	40	38	0.4	4.7	—	—	—	• No significant impacts	
	C501	4.8	38	32	1.8	3	—	—	—	• No significant impacts	
	C502	3.9	31	25	1.9	2	—	—	—	• No significant impacts	
	C174	3.1	25	22	1.3	1.8	—	—	—	• No significant impacts	
	Crossover Links for 4A, 4B, 4C1, 4C2										
	C671	7.9	63	48	5.4	2.5	—	—	—	• No significant impacts	
*The ground disturbance is the estimated amount of potential temporary and permanent disturbance for the Project's two proposed 500 kV transmission lines and associated facilities.											

Table H-12. Impact Levels for Future Land Use

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
Route Group 1: SunZia East Substation to Midpoint Substation	Subroute 1A – North River Crossing	219.5	1739	1196	207.1	12.4	—	—	—	<ul style="list-style-type: none"> Crosses four BLM ROW avoidance areas – two south of the Sevilleta National Wildlife Refuge, one west of Socorro, and one north of Deming: links E101b, E133, E211, A440, and A530 	
	Subroute 1A1	228.8	1813	1238	216.4	12.4	—	—	—	<ul style="list-style-type: none"> Crosses four BLM ROW avoidance areas – two south of the Sevilleta National Wildlife Refuge, one west of Socorro, and one north of Deming: links E101b, E133, E211, A440, and A530 	
	Subroute 1A2 – BLM Preferred Alternative	230.3	1819	1270	217.9	12.4	—	—	—	<ul style="list-style-type: none"> Crosses four BLM ROW avoidance areas – two south of the Sevilleta National Wildlife Refuge, one west of Socorro, and one north of Deming: links E101b, E133, E211, A440, and A530 	
	Subroute 1B – San Antonio Crossing										
	Subroute 1B1	223.6	1772	1189	210.5	13.1	—	—	—	<ul style="list-style-type: none"> Crosses four BLM ROW avoidance areas - three east and west of San Antonio (links A111, A112, A140, A160, and A161); and one north of Deming (links A440 and A530) 	
	Subroute 1B2	209.2	1657	1121	196.1	13.1	—	—	—	<ul style="list-style-type: none"> Crosses four BLM ROW avoidance areas - three east and west of San Antonio (links A111, A112, A140, A160, and A161); and one north of Deming (links A440 and A530) 	
	Subroute 1B3	206.3	1635	1106	193.2	13.1	—	—	—	<ul style="list-style-type: none"> Crosses four BLM ROW avoidance areas - three east and west of San Antonio (links A111, A112, A140, A160, and A161); and one north of Deming (links A440 and A530) Link A80 passes through a 1-mile wide corridor through a BLM ROW exclusion area east of San Antonio along US Route 380 	
	Local Alternative and Crossover Links for Route Group 1										
	Local Alternative Links for 1A and 1B1 (Gran Quivira)										
	E81	21.7	172	120	21.7	—	—	—	—	<ul style="list-style-type: none"> No significant impacts 	

Table H-12. Impact Levels for Future Land Use

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
	E82-E83-E84	33.5	345	99	33.5	—	—	—	—	• No significant impacts	
	E85	7.2	74	24	7.2	—	—	—	—	• No significant impacts	
	Local Alternative Links for 1A, 1B1, 1B2, 1B3										
	A161b	18.6	147	109	18.6	—	—	—	—	• Crosses one BLM ROW Avoidance Area	
	A260	28.4	225	153	28.4	—	—	—	—	• Crosses one BLM ROW Avoidance Area	
	A361-A430-A481	48	380	264	47.8	0.2	—	—	—	• No significant impacts	
	Crossover Links 1B2, 1B3										
	A70	7.7	61	42	7.7	—	—	—	—	• No significant impacts	
Route Group 3: Midpoint Substation to Willow-500 kV Substation	Subroute 3A – North	123.4	978	665	122.6	0.8	—	—	—	• Crosses one BLM ROW Avoidance Area (Link B120b) • Crosses one Recreation Area (Link B160b)	
	Subroute 3A2 – BLM Preferred Alternative	123.9	979	673	123.1	0.8	—	—	—	• Crosses one BLM ROW Avoidance Area (Link B120b)	
	Subroute 3B – South	128.6	1019	638	128.1	0.5	—	—	—	• Crosses three BLM ROW avoidance areas (Links B110a, B110b, and B112)	
	Local Alternative and Crossover Links for Route Group 3										
	Crossover Links 3A, 3B										
	B111	6.9	55	35	5.2	1.7	—	—	—	• Crosses one Pending Solar Application Site	
B140	8.3	66	46	8.3	—	—	—	—	• Crosses one BLM ROW Avoidance Area (Link B140)		
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Subroute 4A – North of Mt. Graham	132.9	1053	778	128.1	4.8	—	—	—	• No significant impacts	
	Subroute 4B – Sulphur Springs Valley	133	1054	793	128.2	4.8	—	—	—	• No significant impacts	
	Subroute 4C										
Subroute 4C1 – San Pedro Valley	139	1101	802	127.3	8.7	2.5	0.5	—	• Crosses agricultural and residential properties (Link C110) • Crosses the Muleshoe EMA-ROW		

Table H-12. Impact Levels for Future Land Use

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
										<ul style="list-style-type: none"> Avoidance (links C331 and C361) • Crosses Swamp Springs/Hot Springs ACEC (Link C331) 	
	Subroute 4C2 – San Pedro Valley	151.8	1203	870	141.5	10.3	—	—	—	<ul style="list-style-type: none"> • Crosses agricultural and residential properties (Link C110) 	
	Subroute 4C2c – West of San Pedro River – BLM Preferred Alternative	161.2	1277	928	150.9	10.3	—	—	—	<ul style="list-style-type: none"> • Crosses agricultural and residential properties (Link C110) 	
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Subroute 4C3 – Tucson	172.9	1370	892	150.1	15.6	6.9	0.3	—	<ul style="list-style-type: none"> • Crosses agricultural and residential properties (Link C110) • Crosses residential properties (F111) 	
	Local Alternative and Crossover Links for Route Group 4										
	Local Alternative Link for 4A, 4B, 4C1										
	C790	8.8	70	40	8.8	—	—	—	—	—	<ul style="list-style-type: none"> • No significant impacts
	Local Alternative Links for 4A, 4B, 4C1, 4C2, 4C3										
	C860	6.9	55	36	6.9	—	—	—	—	—	<ul style="list-style-type: none"> • No significant impacts
	C870	0.2	2	1	0.2	—	—	—	—	—	<ul style="list-style-type: none"> • No significant impacts
	C890	2.8	22	11	0.3	2.5	—	—	—	—	<ul style="list-style-type: none"> • No significant impacts
	Local Alternative Links for 4C1										
	C692	4.8	38	25	4.8	—	—	—	—	—	<ul style="list-style-type: none"> • No significant impacts
	Local Alternative Links for 4C2 – Winchester and Tortolita Substations										
	C260-C261-C201	31	246	205	31	—	—	—	—	—	<ul style="list-style-type: none"> • No significant impacts
	C680	26.1	207	139	25.1	1	—	—	—	—	<ul style="list-style-type: none"> • No significant impacts (THIS IS PART OF 4C2)
	C815	0.9	7	4	0.9	—	—	—	—	—	<ul style="list-style-type: none"> • No significant impacts
	C814	1	8	5	1	—	—	—	—	—	<ul style="list-style-type: none"> • No significant impacts
	C816	0.1	1	1	0.1	—	—	—	—	—	<ul style="list-style-type: none"> • No significant impacts
C812	3.3	26	17	3.3	—	—	—	—	—	<ul style="list-style-type: none"> • No significant impacts 	
C813	0.5	4	3	0.5	—	—	—	—	—	<ul style="list-style-type: none"> • No significant impacts 	

Table H-12. Impact Levels for Future Land Use

Route Group	Alternative Subroute	Length (miles)	*Ground Disturbance (acres)		Impact Levels (miles)					Comments	
			Temporary Disturbance	Permanent Disturbance	Low	Moderate/Low	Moderate	Moderate/High	High		
	C810	2	16	10	2	—	—	—	—	• No significant impacts	
	C810a	1.7	14	9	1.3	0.4	—	—	—	• No significant impacts	
	C817	1.8	14	9	1.8	—	—	—	—	• No significant impacts	
	Local Alternative Links for 4C3										
	F40b-F51-F60a	11.1	88	63	10.1	—	0.1	0.9	—	• Crosses Pima County Managed Land	
	F81a-F81b	32.2	255	136	18.9	2.6	10.6	—	—	• Crosses Pima County Managed Land	
	C812	3.3	26	17	3.3	—	—	—	—	• No significant impacts (DUPLICATE)	
Route Group 4: Willow-500 kV Substation to Pinal Central Substation	Local Alternative Links for 4C1, 4C2, 4C3										
	C72-C90-C121-C211	24.5	194	130	19.1	4.3	1.1	—	—	• Crosses center pivot agricultural land and residential property (Link C121)	
	Crossover Links for 4A, 4B, 4C1										
	C500	5.1	40	38	5.1	—	—	—	—	• No significant impacts	
	C501	4.8	38	32	4.8	—	—	—	—	• No significant impacts	
	C502	3.9	31	25	3.9	—	—	—	—	• No significant impacts	
	C174	3.1	25	22	3.1	—	—	—	—	• No significant impacts	
	Crossover Links for 4A, 4B, 4C1, 4C2										
C671	7.9	63	48	7.9	—	—	—	—	• No significant impacts		
*The ground disturbance is the estimated amount of potential temporary and permanent disturbance for the Project's two proposed 500 kV transmission lines and associated facilities.											