

habitat have been identified. The South Variant construction and operation would have no measurable effects on sensitive aquatic species or their crucial habitat. No protection, mitigation or enhancement measures for protection of these species or crucial habitat have been identified.

5.3.7.4 Cumulative Effects

This is a new Section 5.3.7.4.4. Section heading numbers of the remaining sections in Section 5.3.7.4 are increased accordingly.

5.3.7.4.4 South Variant Alternative.

The South Variant Alternative construction and operation would have no measurable effects on special status aquatic species or their habitats, therefore there would be no measurable cumulative effects on special status aquatic species or their habitats.

5.3.7.5 Unavoidable Adverse Effects

This is a new Section 5.3.7.5.4. Section heading numbers of the remaining sections in Section 5.3.7.5 are increased accordingly.

5.3.7.5.4 South Variant Alternative.

The South Variant Alternative would not have any measurable unavoidable adverse construction or operation effects on special status aquatic species or their habitats.

5.3.8 Vegetation Resources

5.3.8.2 Environmental Effects

5.3.8.2.1 South Alternative

Pg. 5-319, 3rd paragraph

The South Alternative (Intake System, Water Conveyance System, Hydro System, KCWCD System, and Transmission System) construction would directly affect vegetation communities covering 4,800 acres in the ROW. Temporary and permanent effects on vegetation communities in both the Colorado Plateau and Mojave Desert regions are quantified in Table 5-79. The South Alternative would directly affect a total of 4,171 acres in the Colorado Plateau Ecological Region; however, only 12 percent of the disturbance would be permanent. The South Alternative construction would directly affect vegetation communities covering 630 acres in the Mojave Desert Ecological Region, 46 percent of which would be permanent disturbance.

Table 5-79 Temporary and Permanent Disturbance Acres by Vegetation Community – South Alternative		
Vegetative Community Type	Temporary (acres)	Permanent (acres)
Colorado Plateau Ecological System		
Colorado Plateau Active and Stabilized Dune	254.1	9.0
Colorado Plateau Big Sagebrush Shrubland	695.3	46.1
Colorado Plateau Blackbrush-Mormon-tea Shrubland	519.2	22.2
Colorado Plateau Grassland	139.6	4.1
Colorado Plateau Greasewood Flat	12.6	0.4
Colorado Plateau Gypsum Badlands	26.9	0.8
Colorado Plateau Juniper Savanna	5.6	0.0
Colorado Plateau Lower Montane Riparian Woodland and Shrubland	15.0	1.1
Colorado Plateau Mixed Bedrock Canyon and Tableland	209.1	8.0
Colorado Plateau Mixed Desert Scrub	768.6	181.0
Colorado Plateau Mixed Low Sagebrush Shrubland	9.7	0.0
Colorado Plateau Pinyon-Juniper Woodland	522.7	76.0
Colorado Plateau Shrub-Steppe	446.9	149.8
Colorado Plateau Volcanic Rock and Cinder Land	3.5	3.8
Colorado Plateau Wash	39.4	0.3
Subtotal	3668.1	502.7
Mojave Desert Ecological System		
Mojave Desert Active and Stabilized Dune	46.8	9.0
Mojave Desert Bedrock Cliff and Outcrop	3.7	5.2
Mojave Desert Blackbrush-Mormon-tea Shrubland	7.8	34.9
Mojave Desert Creosotebush-White Bursage Desert Scrub	40.3	115.1
Mojave Desert Grassland	23.5	0.0
Mojave Desert Lower Montane Riparian Woodland and Shrubland	1.1	0.0
Mojave Desert Mixed Desert Scrub	65.2	110.4
Mojave Desert Shrub-Steppe	98.8	0.0
Mojave Desert Volcanic Rock and Cinder Land	55.5	6.6
Mojave Desert Wash	0.3	5.3
Subtotal	343.1	286.5
Total	4011.2	789.2
Note: Acres affected by the LPP that are developed or agricultural land, or are non-distinct vegetation types (i.e. invasive vegetation, ruderal land) are not included in this table.		

5.3.8.2.2 Existing Highway Alternative.

Pg. 5-321, 1st paragraph

The Existing Highway Alternative (Intake System, Water Conveyance System, Hydro System, KCWCD System, and Transmission System) construction would directly affect vegetation communities covering 4,245 acres in the ROW. Temporary and permanent effects on vegetation communities in the Colorado Plateau Region are quantified in Table 5-80. The alternative would directly affect a total of 3,609 acres in the Colorado Plateau Ecological Region; however, only 14 percent of the disturbance would be permanent. The alternative's construction would directly affect vegetation communities covering 636 acres in the Mojave Desert Ecological Region, 45 percent of which would be permanent disturbance.

Table 5-80 Temporary and Permanent Disturbance Acres by Vegetation Community – Existing Highway Alternative		
Vegetative Community Type	Temporary (acres)	Permanent acres)
Colorado Plateau Ecological System		
Colorado Plateau Active and Stabilized Dune	258.8	9.0
Colorado Plateau Big Sagebrush Shrubland	496.4	42.0
Colorado Plateau Blackbrush-Mormon-tea Shrubland	516.5	28.7
Colorado Plateau Grassland	12.9	4.1
Colorado Plateau Greasewood Flat	49.9	0.4
Colorado Plateau Gypsum Badlands	127.3	0.7
Colorado Plateau Juniper Savanna	7.6	0.0
Colorado Plateau Lower Montane Riparian Woodland and Shrubland	17.6	1.1
Colorado Plateau Mixed Bedrock Canyon and Tableland	196.3	8.0
Colorado Plateau Mixed Desert Scrub	564.3	175.7
Colorado Plateau Mixed Low Sagebrush Shrubland	3.3	0.0
Colorado Plateau Pinyon-Juniper Woodland	527.7	75.4
Colorado Plateau Shrub-Steppe	292.0	149.8
Colorado Plateau Volcanic Rock and Cinder Land	3.5	3.8
Colorado Plateau Wash	35.4	0.5
Subtotal	3109.5	499.3
Mojave Desert Ecological System		
Mojave Desert Active and Stabilized Dune	46.8	9.0
Mojave Desert Bedrock Cliff and Outcrop	3.7	5.2
Mojave Desert Blackbrush-Mormon-tea Shrubland	7.8	34.9
Mojave Desert Creosotebush-White Bursage Desert Scrub	40.3	115.1
Mojave Desert Grassland	23.5	0.0
Mojave Desert Invasive Upland Vegetation	6.8	0.0
Mojave Desert Lower Montane Riparian Woodland and Shrubland	1.1	0.0
Mojave Desert Mixed Desert Scrub	65.2	110.4
Mojave Desert Shrub-Steppe	98.8	0.0
Mojave Desert Volcanic Rock and Cinder Land	55.5	6.6
Mojave Desert Wash	0.3	5.3
Subtotal	349.9	286.5
Total	3459.4	785.8
Note: Acres affected by the LPP that are developed or agricultural land, or are non-distinct vegetation types (i.e. invasive vegetation, ruderal land) are not included in this table.		

5.3.8.2.3 Southeast Corner Alternative.

Pg. 5-322, 1st paragraph

The Southeast Corner Alternative (Intake System, Water Conveyance System, Hydro System, KCWCD System, and Transmission System) construction would directly affect vegetation communities covering 4,775 acres. Temporary and permanent effects on vegetation communities in the Colorado Plateau Region are quantified in Table 5-81. The alternative would directly affect a total of 4,146 acres in the Colorado Plateau Ecological Region; however, only 12 percent of the disturbance would be permanent. The alternative's construction would directly affect vegetation communities covering 630 acres in the Mojave Desert Ecological Region, 46 percent of which would be permanent disturbance.

Table 5-81 Temporary and Permanent Disturbance Acres by Vegetation Community – Southeast Corner Alternative		
Vegetative Community Type	Temporary (acres)	Permanent acres)
Colorado Plateau Ecological System		
Colorado Plateau Active and Stabilized Dune	254.1	9.0
Colorado Plateau Big Sagebrush Shrubland	699.3	46.1
Colorado Plateau Blackbrush-Mormon-tea Shrubland	519.2	22.2
Colorado Plateau Grassland	139.3	4.1
Colorado Plateau Greasewood Flat	12.6	0.4
Colorado Plateau Gypsum Badlands	26.9	0.8
Colorado Plateau Juniper Savanna	5.6	0.0
Colorado Plateau Lower Montane Riparian Woodland and Shrubland	15.0	1.1
Colorado Plateau Mixed Bedrock Canyon and Tableland	204.2	8.0
Colorado Plateau Mixed Desert Scrub	750.5	181.0
Colorado Plateau Mixed Low Sagebrush Shrubland	4.5	0.0
Colorado Plateau Pinyon-Juniper Woodland	522.7	76.0
Colorado Plateau Shrub-Steppe	442.7	149.8
Colorado Plateau Volcanic Rock and Cinder Land	3.5	3.8
Colorado Plateau Wash	43.0	0.3
Subtotal	3643.0	502.7
Mojave Desert Ecological System		
Mojave Desert Active and Stabilized Dune	46.8	9.0
Mojave Desert Bedrock Cliff and Outcrop	3.7	5.2
Mojave Desert Blackbrush-Mormon-tea Shrubland	7.8	34.9
Mojave Desert Creosotebush-White Bursage Desert Scrub	40.3	115.1
Mojave Desert Grassland	23.5	0.0
Mojave Desert Lower Montane Riparian Woodland and Shrubland	1.1	0.0
Mojave Desert Mixed Desert Scrub	65.2	110.4
Mojave Desert Shrub-Steppe	98.8	0.0
Mojave Desert Volcanic Rock and Cinder Land	55.5	6.6
Mojave Desert Wash	0.3	5.3
Subtotal	343.1	286.5
Total	3986.2	789.2
Note: Acres affected by the LPP that are developed or agricultural land, or are non-distinct vegetation types (i.e. invasive vegetation, ruderal land) are not included in this table.		

This is a new Section 5.3.8.2.4. Section heading numbers of the remaining sections in Section 5.3.8.2 are increased accordingly.

5.3.8.2.4 South Variant Alternative.

The South Variant Alternative (Intake System, Water Conveyance System, Hydro System, KCWCD System, and Transmission System) construction would directly affect vegetation communities covering 4,820 acres. Temporary and permanent effects on vegetation communities in the Colorado Plateau Region are quantified in Table 5-81A. The alternative would directly affect a total of 4,190 acres in the Colorado Plateau Ecological Region; however, only 12 percent of the disturbance would be permanent. The alternative's construction would directly affect vegetation communities covering 630 acres in the Mojave Desert Ecological Region, 46 percent of which would be permanent disturbance.

The direct effects on vegetation would consist of clearing and grubbing vegetation within the pipeline, penstock, pump stations, and hydro stations ROW, and clearing and grubbing vegetation from transmission line tower bases, substations, switch stations, and staging areas. Shrub and herbaceous vegetation would not be cleared and grubbed from the ROW under the transmission lines. Trees would be cleared from the power transmission line ROW where they would conflict with power transmission lines. Effects on vegetation cleared and grubbed from the ROW would be short-term, except for trees removed from power transmission line ROW and vegetation removed for LPP Project features. Construction staging areas would be restored and revegetated and would regain some of their habitat values within two or three growing seasons. Vegetation removed for LPP Project features such as pump stations, hydro stations, regulating tank, reservoirs, substations, and switchyards would be long-term (i.e., permanent) adverse effects on vegetation communities.

The South Variant Alternative operation would have no direct or indirect effects on vegetation communities. Operations and maintenance vehicles would drive on access roads constructed within the permanent ROW, which would be within the area of the construction ROW. While there may be effects in the unlikely event that the pipeline would need to be excavated and repaired or a tree grows underneath a transmission line, no additional vegetation effects would occur except in these rare instances.

**Table 5-81A
Temporary and Permanent Disturbance Acres by Vegetation Community –
South Variant Alternative**

Vegetative Community Type	Temporary (acres)	Permanent (acres)
Colorado Plateau Ecological System		
Colorado Plateau Active and Stabilized Dune	254.1	9.0
Colorado Plateau Big Sagebrush Shrubland	716.7	46.1
Colorado Plateau Blackbrush-Mormon-tea Shrubland	519.2	22.2
Colorado Plateau Grassland	139.6	4.1
Colorado Plateau Greasewood Flat	12.6	0.4
Colorado Plateau Gypsum Badlands	27.5	0.8
Colorado Plateau Juniper Savanna	5.6	0.0
Colorado Plateau Lower Montane Riparian Woodland and Shrubland	15.0	1.1
Colorado Plateau Mixed Bedrock Canyon and Tableland	209.1	8.0
Colorado Plateau Mixed Desert Scrub	767.5	181.0
Colorado Plateau Mixed Low Sagebrush Shrubland	9.7	0.0
Colorado Plateau Pinyon-Juniper Woodland	522.1	76.0
Colorado Plateau Shrub-Steppe	446.8	149.8
Colorado Plateau Volcanic Rock and Cinder Land	3.5	3.8
Colorado Plateau Wash	38.7	0.3
Subtotal	3687.7	502.7
Mojave Desert Ecological System		
Mojave Desert Active and Stabilized Dune	46.8	9.0
Mojave Desert Bedrock Cliff and Outcrop	3.7	5.2
Mojave Desert Blackbrush-Mormon-tea Shrubland	7.8	34.9
Mojave Desert Creosotebush-White Bursage Desert Scrub	40.3	115.1
Mojave Desert Grassland	23.5	0.0
Mojave Desert Lower Montane Riparian Woodland and Shrubland	1.1	0.0
Mojave Desert Mixed Desert Scrub	65.2	110.4
Mojave Desert Shrub-Steppe	98.8	0.0
Mojave Desert Volcanic Rock and Cinder Land	55.5	6.6
Mojave Desert Wash	0.3	5.3
Subtotal	343.1	286.5
Total	4030.8	789.2
Note: Acres affected by the LPP that are developed or agricultural land, or are non-distinct vegetation types (i.e. invasive vegetation, ruderal land) are not included in this table.		

5.3.8.3 Protection, Mitigation and Enhancement Measures

This is a new Section 5.3.8.3.4. Section heading numbers of the remaining sections in Section 5.3.8.3 are increased accordingly.

5.3.8.3.4 South Variant Alternative.

The protection, mitigation and enhancement measures that would be implemented for the South Variant Alternative are the same as described for the South Alternative in Section 5.3.8.3.1.

5.3.8.4 Cumulative Effects

This is a new Section 5.3.8.4.4. Section heading numbers of the remaining sections in Section 5.3.8.4 are increased accordingly.

5.3.8.4.4 South Variant Alternative.

The South Variant Alternative would have the same cumulative effects on vegetation communities as described for the South Alternative in Section 5.3.8.4.1.

5.3.8.5 Unavoidable Adverse Effects

5.3.8.5.1 South Alternative.

Pg. 5-326, 3rd paragraph

The South Alternative would have short-term unavoidable adverse effects on Colorado Plateau Region and Mojave Desert Region vegetation communities during construction. The South Alternative features (pump stations, regulating tank, hydro stations, forebay reservoir, afterbay reservoir, substations and switchyards) would have long-term unavoidable adverse effects on both region's vegetation communities because the footprint of these features (789 acres) would not be revegetated following construction. The portions of the ROW used for access roads along the South Alternative alignment would have long-term unavoidable adverse effects on both region's vegetation communities because the road surfaces would not be revegetated. Transmission line alignments with trees removed would be unavoidably, adversely affected.

5.3.8.5.2 Existing Highway Alternative.

Pg. 5-326, 4th paragraph

The Existing Highway Alternative would have the same unavoidable adverse effects on vegetation communities as described for the South Alternative in Section 5.3.8.5.1, except the long-term unavoidable adverse effects on Colorado Plateau Region and Mojave Desert Region vegetation communities from the footprint of project features would be 786 acres not revegetated following construction.

5.3.8.5.3 Southeast Corner Alternative.

Pg. 5-326, 5th paragraph

The Southeast Corner Alternative would have the same unavoidable adverse effects on vegetation communities as described for the South Alternative in Section 5.3.8.5.1., except the long-term unavoidable adverse effects on Colorado Plateau Region and Mojave Desert Region

vegetation communities from the footprint of project features would be 789 acres not revegetated following construction.

This is a new Section 5.3.8.5.4. Section heading numbers of the remaining sections in Section 5.3.8.5 are increased accordingly.

5.3.8.5.4 South Variant Alternative.

The South Variant Alternative would have the same unavoidable adverse effects on vegetation communities as described for the South Alternative in Section 5.3.8.5.1., except the long-term unavoidable adverse effects on Colorado Plateau Region and Mojave Desert Region vegetation communities from the footprint of project features would be 789 acres not revegetated following construction.

5.3.9 Wetland and Riparian Resources

5.3.9.2 Environmental Effects

5.3.9.2.3 South Alternative.

5.3.9.2.3.3 Potential Jurisdictional Waters.

Pg. 5-340, 2nd – 4th paragraphs

The Lake Powell Pipeline application for Individual Permit (U.S. Army Corps of Engineers File No. SPK-2008-00354) lists the water bodies expected to be considered potentially jurisdictional that would be affected under the South Alternative. A total of 10.54 acres of potential jurisdictional waters would be affected.

Construction of the pipeline would affect 6.29 acres of potential jurisdictional waters. Effects on potential jurisdictional waters within the pipeline corridor would be temporary, with no permanent loss of function or values occurring. Temporary effects would not affect areas of open water, except where pipeline crossings occur through perennial streams (i.e. the Paria River). Effects may include temporary loss of vegetation, soil disturbance, disturbance of hydrological processes, sedimentation, and effects on water quality. These would be minimized by the implementation of construction BMPs (see section 5.3.9.3).

Construction of the forebay and afterbay would permanently affect 4.21 acres of potential jurisdictional waters. Lake Powell Intake construction would permanently affect 0.04 acre. More detail is provided in Appendix C in the Final Wetlands and Riparian Resources Study Report (U.S. Army Corps of Engineers File No. SPK-2008-00354).

This is a new Section 5.3.9.2.6. Section heading numbers of the remaining sections in Section 5.3.9.2 are increased accordingly.

5.3.9.2.6 South Variant Alternative.

The South Variant Alternative would have the same effects on wetland and riparian resources as described for the South Alternative in Section 5.3.9.2.1.