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MEMORANDUM

DATE: April 20, 2023

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SUBJECT: 180194 SunZia Southwest Transmission Project – Environmental Resource Impact Comparison of Potential Impacts on Sevilleta National Wildlife Refuge From Proposed and No-Blowout Designs for Rebuild of Existing Bernardo-Socorro Transmission Line

MESSAGE

This memorandum summarizes the comparison of potential environmental resource impacts in association with the blowout and no-blowout design options as described in the memorandum from Tri-State Generation and Transmission Association, Inc. and SunZia Transmission, LLC that was submitted to the U.S. Fish and Wildlife Service on March 24, 2023 titled: *Comparison of Potential Impacts on Sevilleta National Wildlife Refuge From Proposed and No-Blowout Designs for Rebuild of Existing Bernardo-Socorro Transmission Line.*

The need for additional structures resulting from implementation of the No-Blowout design would have several potential negative impacts, including temporary and permanent loss of wildlife habitat, potential increase in invasive weed establishment, increased erosion and sedimentation, increased perching and nesting opportunities for ravens (*Corvus* spp.), and increased impacts to water resources. The No-Blowout design would result in an additional 21.7 acres of temporary disturbance, and the permanent loss of an additional 1.5 acres of wildlife habitat. Wide-ranging reviews of energy-related impacts support the overall reduction in anthropogenic disturbances as a means to reduce potential impacts to wildlife (Northrup and Wittemyer 2013). In an effort to reduce potential disturbances, the project-specific Plan of Development (POD) identifies Selective Mitigation Measure 7 which states modified tower design or alternate tower types would be used to minimize ground disturbance. Table 1 provides a breakdown of estimated disturbance associated with the different design specifications (total estimated temporary and permanent ground disturbance).

Table 1: Design Impact Specifications

	Proposed Design	No-Blowout Design	Notes
Structure #	71	96	Based on a 35% increase in structures
Temporary Impacts within ROW	~72.3 acres	~94.0 acres	Based on a 30% increase in ground disturbance
Temporary Impacts outside of the ROW	~57.4 acres	~74.62 acres	Based on a 30% increase in ground disturbance
Permanent Impacts within ROW	~15.1 acres	~16.61 acres	Based on a 10% increase in ground disturbance
Permanent Impacts outside of the ROW	0.0	0.0	Assumes no increase in permanent impacts outside the ROW

Vegetation Communities

Table 2 provides a summary of potential impacts to vegetation communities for each design specification. The No-Blowout design would result in increased temporary and permanent disturbance in grassland, mixed desert shrubland, and riparian vegetation communities.

Table 2: Vegetation Community Impacts

Vegetation Community[1]	Acres of Temporary Disturbance		Acres of Permanent Disturbance	
	Proposed Design	No-Blowout Design[2]	Proposed Design	No-Blowout Design[2]
Grasslands	34.5	44.8	7.2	7.9
Mixed Desert Shrublands	32.3	41.9	6.7	7.4
Riparian	5.6	7.2	1.2	1.3
Total	**72.3**	**94**	**15.1**	**16.6**

[1]As described in the Sevilleta National Wildlife Refuge Vegetation Assessment completed for the Project (POWER 2022a).
[2]Assumes a 30% increase in temporary disturbance and a 10% increase in permanent disturbance in each vegetation community.

As described in the Sevilleta NWR Vegetation Assessment completed for the Project (POWER 2022a), grasslands are dominated by a diverse mix of warm-season grasses including six species of dropseed (*Sporobolus* spp.), three species of muhly *(Muhlenbergia* spp.), three species of grama (*Bouteloua* spp.), three species of threeawn (*Aristida* spp.), James' galleta (*Hilaria jamesii*), and burrograss (*Scleropogon brevifolius*). Mixed desert shrubland communities are dominated by varying amounts of broom dalea (*Psorothamnus scoparius*), creosote bush (*Larrea tridentata*), fourwing saltbush (*Atriplex canescens*), and honey mesquite (*Prosopis glandulosa*). Riparian communities included both riparian shrublands in smaller arroyos and riparian woodlands in larger arroyos, including the Rio Salado. Riparian shrublands are dominated by Apache plume (*Fallugia paradoxa*), mule fat (*Baccharis salicifolia*), and willow baccharis (*Baccharis salicina*). The riparian woodlands are dominated by salt cedar (*Tamarix ramosissima*), Russian olive (*Elaeagnus angustifolia*), and coyote willow (*Salix exigua*).

Invasive Species

During field surveys conducted on the Sevilleta NWR in 2022 (POWER 2022b), the only noxious weed species identified in the survey area were salt cedar and Russian olive. These species are associated with riparian vegetation communities. As the probability of establishment and spread of invasive plant species generally increases with increased disturbance, the increased temporary and permanent disturbance associated with the no blow-out design will increase the potential for further establishment of these noxious weed species (Meyer et al. 2021, Walker and Smith 1997). Invasive plant species establishment can alter the recovery of plant communities following disturbance. Salt cedar in particular has been found to profoundly alter the species composition of riparian vegetation communities through salinizing surface soils and depressing water tables due to its high transpiration rate (Walker and Smith 1997). Once salt cedar becomes dominant, it can impact ecosystem processes such that native species have little probability of reestablishing without human intervention (Walker and Smith 1997).

Soil Erosion and Sedimentation

The increased temporary and permanent disturbance to vegetation communities associated with the No-Blowout design has the potential to result in increased soil erosion and sedimentation. Reductions in plant cover are associated with increased wind erosion in desert grasslands in New Mexico (Li et al. 2007) and may increase sedimentation due to overland flow. In desert soils, a lack of plant cover leaves the soil surface exposed to the energetic impacts of raindrops as well as the erosional and depositional effects of overland flow (Abella 2010). Nonpoint source pollution resulting from increased erosion/sedimentation can affect water quality and the chemical, biological, and physical characteristics of a watershed (Amesbury et. al. 2010) which could be exacerbated with increased ground disturbance under the No-Blowout design. Under both design scenarios, erosion and sediment control devices will be installed during construction and will remain in place until site stabilization.

Special Status Species

Based on the habitat models developed for the Final EIS (BLM 2023), the Project crosses potential habitat for Bendire's thrasher (*Toxostoma bendirei*) and Gunnison's prairie dog (*Cynomys gunnisoni*). Table 3 provides a summary of potential impacts to Bendire's thrasher and Gunnison's prairie dog habitat for each design specification. The no-blowout design would result in increased temporary and permanent disturbance in potential habitat for both species.

Table 3: Special Status Species Impacts

Potential Habitat[1]	Acres of Temporary Disturbance		Acres of Permanent Disturbance	
	Proposed Design	No-Blowout Design[2]	Proposed Design	No-Blowout Design[2]
Bendire's Thrasher	32.9	42.8	7.1	7.8
Gunnsion's Prairie Dog	62.3	80.9	12.1	13.3

[1]Based on habitat models developed for the Final EIS (BLM 2023)

[2]Assumes a 30% increase in temporary disturbance and a 10% increase in permanent disturbance in each habitat.

The Final EIS also identifies potential habitat for New Mexico meadow jumping mouse (*Zapus hudsonius luteus*) and Pecos sunflower (*Helianthus paradoxus*) as occurring at the Rio Salado crossing on the Sevilleta NWR. However, both species are associated with wetland habitats. Field survey results confirmed that wetland habitats are not present at the Rio Salado crossing. Therefore, neither design specification has potential to impact New Mexico meadow jumping mouse or Pecos sunflower.

Avian Interactions

The Avian Power Line Interaction Committee's 2012 document Reducing Avian Collisions with Power Lines: The State of the Art 2012 provides guidance on how to reduce and avoid potential avian collision and is widely considered the gold standard of avian-power line collision research. APLIC 2012 reviews and cites numerous publications regarding the effectiveness of bird flight diverters, line placement within the landscape, and general line design to reduce avian collision. Typically, birds approach a power line, gain altitude to avoid the thicker and more visible conductor, and strike the smaller less visible overhead ground wire (Morkill and Anderson 1990; Murphy et al. 2009). Such instances typically occur mid-span (APLIC 2012) and are less likely to occur near the structure where the structure itself presents a more visible obstruction. APLIC 2012 suggests that by reducing the length of the mid-span where collisions occur, the likelihood of avian collision would be reduced. However, there is no empirical data to back up that assertion. The authors of APLIC 2012 do not provide any supporting studies. Bernardino et al. (2018) provided additional review of relevant avian collision research and found little to no evidence that reducing span length was an effective method to reduce collisions. Therefore, there is no data that would suggest the no-blowout design and the proposed design would present a differing level of avian collision.

While the potential for avian collision would not differ substantially between the no-blowout design and the proposed design, the potential for indirect effects on wildlife from avian predation may differ. Ravens (*Corvus* spp.) are a known predator in the desert southwest that frequently use transmission line structures for nesting and perching (Steenhof et al 1993; USFWS 2008; Boarman and Heinrich 2020). An increase in structures of 35% (from 71 to 96) could lead to increased perching and nesting opportunities for ravens, which in turn could lead to increased predation (migratory birds, small mammals, etc., including sensitive species) on the Sevilleta NWR.

Water Resources

POD Selective Mitigation Measure 8 states that in designated areas, structures would be placed so as to avoid and/or allow conductors to span sensitive features such as riparian areas and water courses. Mitigation identified in the Biological Opinion (USFWS 2023) states that soil activities will be minimized, to the extent possible, within 50 meters of all desert washes. Current project design (blowout) spans the Rio Salado channel/ordinary high water mark (OHWM) according to the field waterway delineations completed by POWER in 2022. Adding structures and decreasing average span length from approximately 846 feet to 626 would likely result in the placement of one or two additional structures within the OHWM of the Rio Salado. Not including temporary impacts to this waterway to facilitate access roads for construction, the no-blowout design could result in an additional 80,000 square feet (1.8 acres; 200-by-200-foot footprint per structure) of temporary construction disturbance area and a minimal permanent disturbance of 5,000 square feet (0.12 acre, 50-by-50-foot area per structure) around the base of each structure. These additional impacts would need to be included in the pre-construction notification that was submitted to the U.S. Army Corps of Engineers (Clean Water Act Section 404 compliance) and the New Mexico Environment Department (Water Quality Certification, Clean Water Act Section 401 compliance).

Summary

In summary, implementation of the no-blowout design would result in an increase of potential negative impacts compared to the current design, including temporary and permanent loss of wildlife habitat, potential increase in invasive weed establishment, increased erosion and sedimentation, increased perching and nesting opportunities for ravens, and increased impacts to water resources.

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