APPENDIX E

VISUAL RESOURCES

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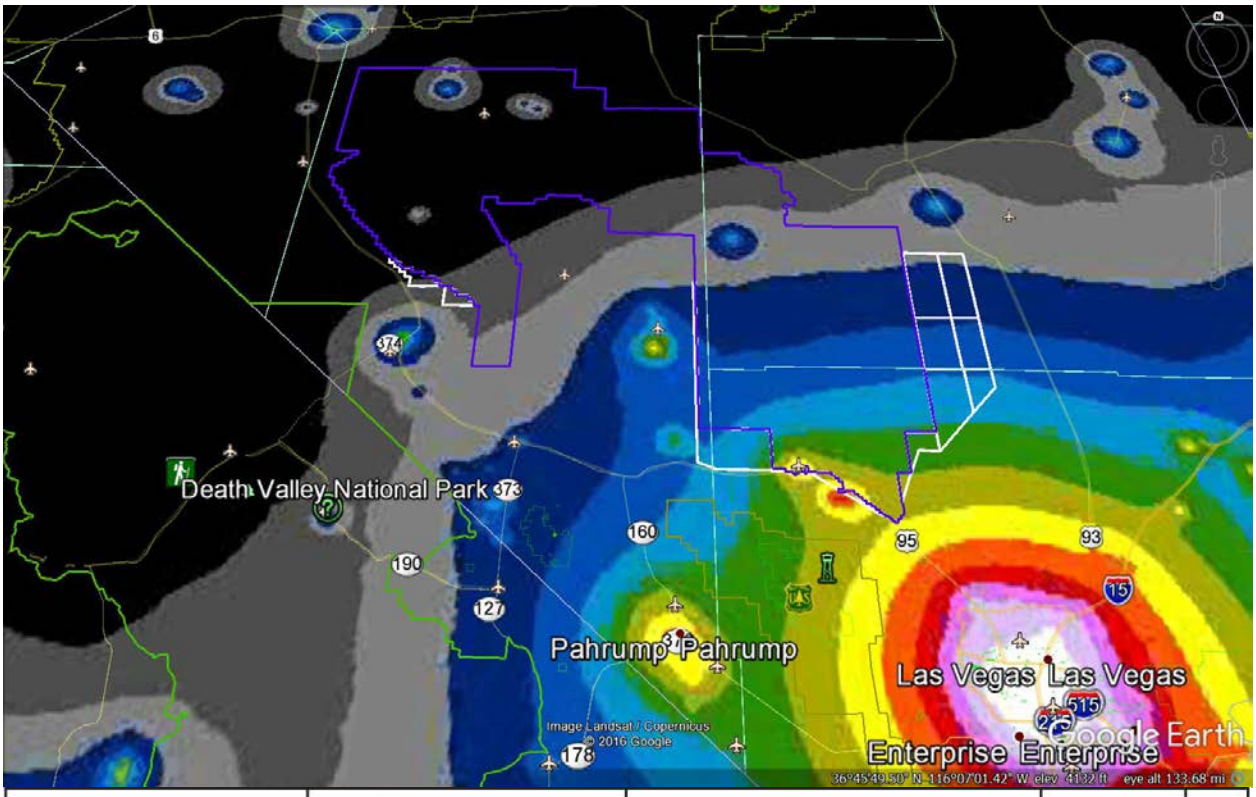
E.1 VISUAL RESOURCES

Natural darkness (darkness undiminished by artificial light) is recognized as an important and increasingly rare natural resource. The excessive or inappropriate use of artificial light, termed "light pollution," now blocks the Milky Way galaxy in the night sky for nearly 80 percent of Americans (Billings, 2016). Light pollution is a side effect of industrialization and development, and includes glare, skyglow (brightening of the night sky over inhabited areas), light trespass (light falling in unintended areas), and clutter (excessive grouping of light sources) (http://darksky.org/light-pollution/). The components of light pollution are generated by both the interior and exterior lights of any kind of human development, including residential structures, transportation thoroughfares, energy generating facilities, and commercial areas. While there is light pollution from all developed areas in Nevada, most famously Las Vegas, the state retains some of the darkest night skies left in the nation (Pesek, 2012). Federal land management agencies promote the retention of natural night skies though participation in the "Dark Skies Initiative." The National Park Service "Natural Sounds and Night Skies" Division deals specifically with the preservation of natural darkness, and the BLM has specific guidance related to the mitigation of light pollution, such the BLM "Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands."

Satellite imagery provides extensive temporal geospatial information on the prevalence of light pollution. One imagery product compiled and released by NOAA (Center, 2013) uses the visible/near-infrared and thermal infrared bands from the Defense Meteorological Satellite Program to depict the average annual radiance from lights from cities, towns, and other sites with persistent lighting (Doll, 2008), including gas flares, and is shown in Figure E-1. Features such as the town of Beatty, Creech AFB, various landing strips at NTTR, and the High Desert Prison are clearly collocated with higher persistent lighting values. These features also contribute to skyglow, which is modeled by the Light Pollution Science and Technology Institute in their "The New World Atlas of Artificial Night Sky Brightness" (Falchi, 2016). Derived from the Visible/Infrared Imager/Radiometer Suite onboard the Suomi National Polar-orbiting Partnership satellite, skyglow over the project area is shown in Figure E-1.



Ratio to natural brightness	Artificial brightness (µcd/m²)	Approximate total brightness (mcd/m²)	Color	
<0.01	<1.74	<0.176	Black	
0.01–0.02	1.74–3.48	0.176–0.177	Dark gray	
>0.02–0.04	>3.48–6.96	>0.177–0.181	Gray	
>0.04–0.08	>6.96–13.9	>0.181–0.188	Dark blue	
>0.08–0.16	>13.9–27.8	>0.188–0.202	Blue	
>0.16–0.32	>27.8–55.7	>0.202–0.230	Light blue	
>0.32–0.64	>55.7–111	>0.230–0.285	Dark green	
>0.64–1.28	>111–223	>0.285–0.397	Green	
>1.28–2.56	>223–445	>0.397–0.619	Yellow	
>2.56–5.12	>445–890	>0.619–1.065	Orange	
>5.12–10.2	>890–1780	1.07–1.96	Red	
>10.2–20.5	>1780–3560	>1.96–3.74	Magenta	
>20.5–41	>3560–7130	>3.74–7.30	Pink	
>41	>7130	>7.30	White	

Figure E-1. Artificial Night Sky Brightness

E.2 REFERENCES

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