A typical visual simulation is produced by combining site photography with accurately rendered computer models of facilities to predict what a project would look like if it were built. Creation of visual simulations to analyze the potential impacts of the proposed project, in both day and nighttime environments, was broken into four basic steps:

Step 1. Design Data Preparation / Site Photography

Tetra Tech conducted a thorough review of available data for the proposed project before visiting the site. Using these data, Tetra Tech identified key observation points (KOPs) for the project. Tetra Tech then conducted a photographic inventory of each Project area using a Nikon D90, 52mm lens with an attached GPS unit. This inventory serves as a sampling of the visual landscape and represents typical views from publicly accessible areas. From this exercise, Tetra Tech created a series of photographic files and a corresponding photo-point location map the client could use to help guide in the selection of the KOPs to be simulated.

Step 2. Computer 3D Digital Modeling / Terrain Modeling / Materials Texturing

Tetra Tech took the client-provided design and generated an accurate scaled three dimensional (3D) computer model. Using a U.S. Geological Survey National Elevation Dataset to generate a Digital Elevation Model and aerial imagery, Tetra Tech placed the 3D models in real-world coordinates to ensure the utmost accuracy.

Step 3. View-Matching / Lighting / Rendering

Once the photographs had been reviewed, Tetra Tech selected the KOPs to view-match in 3D software that best represent typical views of visitors and residents of the project site and surrounding area. Tetra Tech then used a real-world lighting system in the model, simulating the sun angle, date, and time of the photograph, and rendered each of the views.

Step 4. Digital Painting / Compositing

Once complete, Tetra Tech added the rendering of the lighted and textured 3D model to the existing conditions photographs using image editing software. It was in this step that details from the computer model were blended seamlessly into the base photograph to produce the final “before” and “after” visual simulations. Tetra Tech then sent the final simulations for client approval and made any minor revisions as needed.

Night Simulation Limitations

Three night simulations were conducted using a remote to trigger the shutter. The first photograph used in the simulation was shot at sunset and faced east, away from the brightest part of the sky. The second photograph was shot facing north, and the last faced west. Times for the night simulations ranged from 8:17 p.m. (near sunset for June 4, 2011) to 9:14 p.m. The lighting in the simulations was based on the Federal Aviation Administration’s (FAA) Obstruction Light requirements. As required by these regulations, flashing will occur randomly in each tower 20 to 40 times per minute.

While the nighttime simulations portray how a nighttime photo of the proposed project would appear accurately, they may not illustrate what observers see when viewing such lights in the field accurately. The long exposure times needed for nighttime photography can result in images that can also differ from what an observer in the field would experience. To observers in the field, the white centers of the lights and/or the “halo” may vary slightly. Also, beam patterns and lighting intensities are all considered artist’s interpretations, and reasonable assumptions / approximations were made to best represent the existing nighttime conditions during which the photos were taken. To represent worst-case scenario, the simulation shows the sets of flashing lights in the middle of the towers on at the same time.