Each pond would be provided with an independent leak detection and removal system (LDRS) between the inner and outer liners. An HDPE geonet with a minimum thickness of 150 mils would be installed between the liners to collect leakage through the inner liner and carry the liquids to a drainage trench located in the center bottom of each cell. The drainage trench would be rock-filled and constructed with a minimum of a 6-inch-diameter perforated HDPE pipe. A geotextile cushion layer would be placed around the rock to prevent punctures of the geomembrane liner.

Each pond would have a rock-filled collection sump constructed within the LDRS. This collection sump would have a minimum depth of 30 inches. A perforated HDPE sump pipe would be installed inside of each sump. Each sump pipe would extend up the side slope of the cell to a concrete access area. A horizontal sump pump would be installed inside each sump pipe to pump out leakage and return it back into the pond. Each pump would have a local mounted controller with instrumentation. Each pump would be sized to remove twice the maximum leakage resulting from one 100-millimeter-diameter hole per acre with the pond at its maximum water level.

The pond influent system would be designed so that each pond could operate independently should a shutdown of a pond for maintenance be required. Discharge into each pond would be via pipes installed over the top of the dike and into each pond.

The calculated volume of stormwater retention required at the proposed power plant site and substation would be 7.44 acre-feet (324,086 cubic feet). This amount of storage was determined using information and calculation procedures in accordance with the ADEQ guidelines and procedures for stormwater detention/retention, which predicted a 100-year, 24-hour storm event (refer to Section 2.2.8.4). This amount was added to the amount of process wastewater expected in order to properly size the evaporation ponds.

2.2.1.7 Plant Auxiliaries

Lighting

Lights would be necessary to safely operate the facility at night. Lighting would be limited to areas required for safety in and around the proposed power plant and substation; no lighting is proposed for the area around the evaporation ponds. Lighting would be shielded from public view where and when possible. Lighting would be directed downward and shielded in accordance with the Mohave County Night Sky Ordinance. Highly directional, high-pressure sodium vapor fixtures would be used.

Communication Facilities

A microwave communication tower and antenna would be constructed on the proposed power plant site to deliver signals from control centers and other remote locations, and to report operating status. This network also would provide voice communication from dispatchers to power plant operators and maintenance personnel. Microwave communications require an unobstructed “line of sight” between antennas. A communications tower about 6 meters (20 feet) high would be constructed at the proposed power plant site, with a microwave antenna aimed toward an existing communication link on Aubrey Peak or in Wikieup.

Grounding and Cathodic Protection

The Proposed Action would include a grounding system that would be designed and installed in accordance with applicable industry standards.

The proposed power plant’s electrical system would be susceptible to ground faults, lightning, and switching surges that could result in high voltage, creating a hazard to site personnel and electrical equipment. The grounding system would minimize these risks by shunting over-voltage phenomena to ground in a manner that would reduce exposure of personnel or equipment to excessive voltage, current, or temperature. Industry standards and guidelines

for grounding of generation equipment and substations would be followed.

The grounding grid would be a network of bare copper conductors, laid out in an orthogonal pattern. The conductor size, spacing of conductors, and depth of burial would be determined by design based upon a number of factors, including soil characteristics and maximum ground fault and lightning intensity. Ground rods might be driven deeper into the earth and bonded to the grid, if necessary, to obtain adequate contact with the earth. There would be risers from the grid to the surface, where grounding wires to equipment and structures would be connected.

Cathodic protection systems would be provided to control the corrosion of underground metal piping. Cathodic protection would include protective covering of pipes, as well as sacrificial anode systems. Depending upon the corrosion potential and the site soils, either passive or impressed current cathodic protection would be provided.

Fire Protection

Fire protection would be supplied by the use of diesel-driven emergency fire pumps, in accordance with National Fire Protection Association (NFPA) guidelines. Fire detection devices would be installed at key points throughout the proposed power plant. These would include smoke detectors, flame detectors, and temperature detectors, as appropriate.

Fixed fire suppression systems would be installed at determined fire risk areas, such as the turbine lubrication oil equipment and cooling towers. The power plant fire suppression water loop also would supply water to a vapor suppression system at the aqueous ammonia storage tank area. Sprinkler systems also would be installed in the control/administration building and fire pump building, as required by NFPA and local code requirements. The combustion turbine generator units would be protected by a deluge spray mist-type fire protection system.

Hand-held fire extinguishers and hand cart extinguishers of the appropriate size and rating would be located in accordance with NFPA 10, Standard for Portable Fire Extinguishers, throughout the facility.

Safety Systems

Several safety features would be integrated into the power plant design, including the following:

- Emergency power for control and protection systems for the combustion turbines would be supplied from redundant direct current systems within the respective combustion turbine. Power for control and protection systems for the boilers, steam turbine, and balance of plant would be supplied from a redundant direct current system (batteries) not associated with the combustion turbines.

- All electrical systems would be grounded to reduce the potential for electrical shock.

- All high-pressure steam systems would be routinely tested and inspected to ensure adequate reliability and safe operation.

- All structures would be designed and constructed to comply with Uniform Building Code (UBC) Seismic Zone 2b practices.

- Safety showers and eyewashes would be provided adjacent to, or in the area of, all chemical storage and use areas. Hose connections would be provided near the chemical storage and feed areas to flush spills and leaks to the neutralization facility. Power plant personnel would use state-approved personal protective equipment during chemical spill containment and cleanup activities. Personnel would be properly trained in the handling of these chemicals and instructed in the procedures to follow in case of a chemical spill or accidental release. Adequate supplies of absorbent material would be stored on site for spill cleanup.

- Electric equipment insulating materials would be specified to be free of polychlorinated biphenyls (PCBs).

- Hazardous wastes generated during construction would be handled, controlled, and disposed of by the contractor in accordance with standard industry practices and appropriate regulations.

- A 6-foot-high chain-link fence would be installed around the perimeter of the proposed power plant site and around individual water well heads. A four-strand barbed wire fence would be installed around the evaporation ponds. A cattle guard and gate would be installed where the access road enters the plant, and the gate would remain closed during normal operating hours.

2.2.1.8 Operational Noise

A typical combined-cycle power plant generating 720-MW of power has a characteristic noise level of 75 A-weighted decibels (dBA) at 400 feet from the main facilities. Much of this noise originates from the turbines and cooling towers, but operational noise can occur from a variety of sources and activities at the plant. Section 3.1.8 provides more detail on noise levels that could be expected at various distances from the proposed power plant boundary.

2.2.2 Transmission System Modifications

2.2.2.1 Substation and Electrical Equipment

The substation would provide the interconnection between the proposed power plant and the Mead-Phoenix Project 500-kV transmission line. The proposed electrical substation for the high-voltage transmission interconnection would cover about 12 acres and would be located between the proposed power plant and the existing Mead-Phoenix Project 500-kV transmission line. The transmission line crosses the proposed power plant site, eliminating the need for new electrical transmission lines to connect the proposed power plant to the regional grid. Western would design, construct, maintain, and operate the proposed substation. Figure 2-4a shows the location of the substation, and Figure 2-8 provides a photograph of a typical substation. A substation contains several different kinds of equipment arranged to carry out electrical functions, minimize safety risk, and accommodate operation and maintenance. The discussion below describes the equipment that would be installed in the proposed substation.

Transformers

Three 3-phase 500/16-kV transformers would be installed during the first phase of the proposed Project to step-up the voltage from the proposed power plant. Electricity produced by the steam turbine generators and the combustion turbine generators would be transformed to 500-kV for delivery over the transmission system. Each generator would be connected to the high-voltage substation via generator leads, conductor support structures, and a generator step-up transformer. Also, one 3-phase 69/16-kV transformer for interconnecting with the existing Mohave Electric Cooperative (MEC) 69-kV transmission line would be used for construction power and station service. One 3-phase 16/12.47-kV transformer would be installed for serving water supply pump loads. A 500/69-kV transformer may be installed to strengthen the tie with the local 69-kV system. For Phase 2 of the proposed Project, one additional 3-phase 500/16-kV generator step-up transformer would be installed.

The step-up transformers each would contain about 45 cubic meters (12,000 gallons) of cooling oil. An oil containment liner would be installed to collect and retain oil within the substation should an oil spill occur, in accordance with a Spill Prevention, Control and Countermeasures (SPCC) Plan. Only newly purchased electrical equipment certified as PCB-free would be installed.