5.6 Hazardous Material Handling

This section addresses potential impacts from the use of hazardous materials during construction and operation of the PHPP.

5.6.1 LORS Compliance

Design, construction and operation of the PHPP will be conducted in accordance with LORS pertinent to hazardous materials handling. The applicable Federal, State, and local LORS are summarized in Table 5.6-1, and discussed in the text following the table.

Table 5.6-1 Summary of Applicable Hazardous Materials LORS

LORS	Applicability	Where Discussed in AFC
Federal:		
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund), 42 USC §9601 *et seq.,* 40 Code of Federal Regulations (CFR) Part 302, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA)	Requires notification to various agencies when there is a release of hazardous substances from a facility.	Sections 5.6.1 and 5.16
Emergency Planning and Community Right to Know Act (EPCRA), 42 USC §11001 *et seq.* 40 CFR Parts 350, 355, and 370	Requires inventory reporting, planning and reporting for hazardous and acutely hazardous materials.	Section 5.6.1
Occupational Safety and Health Standards, 29 USC Section 65129; 29 CFR 1910 *et seq*. and Safety and Health Regulations for Construction, 29 CFR 1926 *et seq*.	Specifies standards for hazardous materials storage, handling, and worker protection in emergencies.	Sections 2.0, 5.6.1. and 5.18
Oil Pollution Prevention, 40 CFR 112	Requires the preparation of a Spill Prevention Control and Countermeasures (SPCC) Plan.	Sections 5.6.1 and 5.17
State:		
Hazardous Material Business Plan, California Health and Safety Code (HSC) § 25500 to 25541; 19 CCR §§ 2720-2734.	Requires the preparation and submittal of a chemical inventory, and planning and reporting for management of hazardous and acutely hazardous materials.	Section 5.6.1

LORS	Applicability	Where Discussed in AFC
Hazardous Substance Information and Training Act (HSITA), 8 CCR § 339; § 3200 *et seq*., 5139 *et seq.* and 5160 *et seq.*	Requires listing and implementation of specified control measures for management of hazardous substances.	Section 5.6.3
Safety Management Plans, Code of California Regulations (CCR) 8 CCR Section 5189	Requires facility owners to develop and implement effective safety management plans.	Section 5.6.3
California Building Standards Code, CCR, Title 24	Requires local Building Official to inspect and verify compliance with hazardous material management requirements prior to issuance of an occupancy permit.	Section 5.6.1
California Government Code Section 65850.2	Restricts the issuance of an occupancy permit to until the facility has submitted an RMP to the administering agency.	Section 5.6.3
Storm Water Pollution Prevention, Water Quality Order 97-03-DWQ, General Permit CAS000001 and Construction Activities Storm Water General Permit Order 99-08-DWQ	Requires the preparation of Storm Water Pollution Prevention Plans for construction and industrial activities.	Sections 5.6.3 and 5.17
California Safe Drinking Water and Toxic Enforcement Act (Proposition 65) HSC §25249.5 *et seq*.; CCR Title 22, Division 2, Part 2, Subdivision 1, Chapter 3 *et seq*.	California Safe Drinking Water and Toxic Enforcement Act (Proposition 65) requires persons who emits certain toxic chemicals to provide warning to exposed persons, and prevents certain toxic chemicals from being discharged into sources of drinking water.	Section 5.6.1
Local:		
California Fire Code, Title 8 City of Palmdale Code Section 8.04.400	Adopts the California Fire Code, 2007 Edition, into City of Palmdale regulations.	Sections 5.6.1 and 5.18.1
Industry Codes and Standards:		
American Society of Mechanical Engineers (ASME), American National Standards Institute (ANSI) and American Society of Testing Materials (ASTM)	Sets forth standards for power plant design, including mechanical systems, electrical, and piping.	Sections 2.0, 5.6.1, and 5.18 Appendix C
Uniform Fire Code, Articles 79, 80, and others	Sets forth requirements for the storage and handling of hazardous materials.	Sections 2.0, 5.6.3, and 5.18
National Fire Protection Agency (NFPA)	Establishes fire prevention standards and guidelines.	Sections 2.0, 5.6.3, and 5.18

5.6.1.1 Federal LORS

Federal LORS applicable to the handling and storage of hazardous materials are discussed below and listed in Table 5.6-1.

CERCLA (Superfund), as amended by SARA, and EPCRA

CERCLA prescribes that the National Response Center be notified for any release of a reportable quantity of a hazardous substance (42 USC Section 9603); notification requirements for any potentially injured parties in connection with any such release (42 USC Section 9611 (g)); and sets forth requirements for demonstration of financial responsibility in connection with the storage of hazardous substances (42 USC Section 9608(b)).

Superfund regulations define "hazardous substance" as any material appearing in lists referenced in 42 USC Section 9601(14)(Section 101). EPA's regulations codified at 40 CFR 302.4, Table 3.2-4, set forth the list of hazardous substances under CERCLA and the reportable quantities for each.

SARA Title III established a nationwide emergency planning and response program and imposed reporting requirements for businesses that store, handle, or produce significant quantities of extremely hazardous materials. The Act (codified in 40 C.F.R., §68.110 *et seq*.) requires states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of these Acts are reflected in the California HSC, Section 25531 *et seq*.

The Project will conform to these requirements by developing a Hazardous Materials Business Plan (HMBP). The administering agencies for the above authority are the EPA (Region IX), the National Response Center, and the Los Angeles (LA) County Fire Department Health and Hazardous Materials Division (HHMD). The HHMD became a Certified Unified Program Agency (CUPA) in 1997 and administers the hazardous materials programs for the City of Palmdale.

Chemical Accident Prevention Provisions, 40 CFR Part 68

40 CFR Part 68 requires the preparation of a Risk Management Plan (RMP) if certain listed toxic or flammable substances are used in excess of the listed threshold quantity. The RMP addresses in detail the emergency prevention implemented at the facility and the response actions planned by the facility in the event of a hazardous materials release. The RMP is based on studies identifying potential hazards associated with the handling of the listed materials used at the facility. California has developed its own program (California Accidental Release Prevention [CalARP]) that generally mirrors the Federal RMP program (see below). For those aspects of the California program that differ from the Federal program, California's program is more stringent. The administering agencies are EPA and the LA County Fire Department. The PHPP is not subject to the Federal RMP rule because none of the chemicals stored or used by the Project are present onsite in quantities exceeding the threshold quantities.

Occupational Safety and Health Standards, 29 USC Section 65129; 29 CFR 1910 *et seq*. and Safety and Health Regulations for Construction, 29 CFR 1926 *et seq*.

These standards require employee training, personal protective equipment, safety equipment, and written procedures, programs and plans for insuring worker safety when working with hazardous materials or in hazardous work environments. Although intended primarily to protect worker health and safety, these requirements affect general facility safety.

In 1992, the Department of Labor Occupational Safety and Health Administration (OSHA) issued rules for Process Safety Management of Highly Hazardous Chemicals (29 CFR 1910.119) which address the prevention of catastrophic accidents. The rule requires companies handling hazardous substances in

excess of specific threshold amounts to develop and implement a Process Safety Management (PSM) plan. The requirements of the PSM rule are directed primarily at protecting workers within the facility. A PSM plan generally mirrors the RMP required under 40 CFR 68. The PHPP plans to use aqueous ammonia (ammonia concentration of approximately 19 percent), which is well below the OSHA 44-percent concentration that triggers PSM requirements; thus, a PSM plan is not required for the Project. The administering agency for these requirements is Federal OSHA.

Oil Pollution Prevention, 40 CFR Part 112

The Oil Pollution Prevention regulations (40 CFR 112) require the preparation of a SPCC Plan if oil is stored at the facility in excess of 1,320 gallons in aboveground storage. The SPCC regulations place restrictions on the management of petroleum materials and, therefore, have some bearing on hazardous materials management (also see Section 5.16, Waste Management). PHPP will prepare a SPCC Plan, as required.

Chemical Facility Anti-Terrorism Standard, 6 CFR Part 27

The Chemical Facility Anti-Terrorism Standard (CFATS) of the Cal/EPA Department of Health Services (DHS) regulations requires that facilities which use or store certain hazardous materials in substantial quantities to submit information to the DHS so that a vulnerability assessment can be conducted to determine what security measures should be implemented to ensure facility security. The administering agency is the DHS.

The Project proposes to use three chemicals listed as Chemicals of Interest in the regulation: hydrogen, methane (a component of natural gas), and cyclohexylamine (found in a water treatment product). However, none of the chemicals will be stored or used onsite during construction or operation of the Project in excess of the applicable threshold quantity. A maximum of approximately 640 pounds for hydrogen will be present onsite in storage and in the process equipment, well below the threshold of 10,000 pounds; a maximum of 140 pounds of methane will be present in natural gas in the process equipment, well below its threshold of 10,000 pounds; and a maximum of 665 pounds of cyclohexylamine will be stored onsite, well below its threshold of 15,000 pounds. Therefore, the CFATS will not apply to the PHPP.

5.6.1.2 State LORS

Applicable State of California LORS are summarized below.

HMBP, California HSC Sections 25500 - 25543.3; 19 CCR Section 2720 - 2734

These sections require the preparation of a HMBP by the facility operator. The HMBP identifies the hazards, storage locations and storage quantities for each hazardous chemical stored onsite. The HMBP is submitted to the CUPA for emergency planning purposes. A HMBP will be prepared by the Project to comply with these requirements. The administering agency is the CUPA, which in this case is the LA County Fire Department.

Hazardous Substance Information and Training, 8 CCR Section 339; Section 3200 *et seq*., Section 5139 *et seq*. and Section 5160 *et seq*.

Hazardous chemicals regulated under the Hazardous Substance Information and Training (HSITA) are listed in 8 CCR Section 339. 8 CCR Sections 3200 *et seq*. and 5139 *et seq*. address control of hazardous substances; 8 CCR Section 5160 *et seq*. address hot, flammable, poisonous, corrosive, and irritant substances. The California regulations contained in Title 8 (Division of Occupational Safety and Health) are generally more stringent than those contained in Title 29 of the Federal regulations. The facility will have a robust safety training program meeting the requirements of this rule. The administering agency for these requirements is the California Occupational Safety and Health Agency (Cal-OSHA).

Safety Management Plans, 8 CCR Section 5189

8 CCR Section 5189 requires facility owners to develop and implement effective safety management plans to insure that large quantities of hazardous materials are handled safely. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process. The facility will have a robust safety training program meeting the requirements of this rule. The administering agency for these requirements is Cal-OSHA.

Risk Management Plan, HSC Section 25531 *et seq*.

The CalARP Program regulations were developed by the California Office of Emergency Services (CCR Title 19, Division 2, Chapter 4.5) to merge the Federal and State programs for the prevention of accidental release of regulated toxic and flammable substances. The preparation of a CalARP RMP is required when certain listed toxic or flammable substances are used in excess of the listed threshold quantity. The RMP addresses in detail the emergency planning and response actions in the event of a hazardous materials release at a facility. The RMP is based on studies identifying potential hazards associated with the handling of these listed materials proposed for use at the facility. The CalARP regulations define three program levels for RMPs depending on the complexity, accident history and potential impact of a worst-case release of the regulated substance.

The following is a summary of the Federal and State regulated substances to be used at the PHPP.

- **Section 2770.5 Tables 1 and 2 of CCR Section 2770.5** list Federal Regulated Substances and threshold quantities for accidental release prevention, including flammable substances. Hydrogen is on the Federal list; however, aqueous ammonia (less than 20 percent concentration) and sulfuric acid are not. The expected maximum quantity of hydrogen of 640 pounds (approximately 320 pounds in the generator cooling loop plus 320 pounds in a tube trailer) at the Project does not exceed the listed threshold quantity of 10,000 pounds. Therefore, hydrogen is not considered a Federal Regulated Substance.

- **Section 2770.5 Table 3 of Section CCR 2770.5** lists State Regulated Substances and threshold quantities for accidental release prevention. Aqueous ammonia and sulfuric acid are listed. The maximum quantity of aqueous ammonia proposed for storage at the Project (30,000 gallons or approximately 45,000 pounds as ammonia) exceeds the threshold quantity of 500 pounds; therefore, aqueous ammonia is considered a State Regulated Substance for which a RMP is required. Sulfuric acid is a State Regulated Substance only if: 1) it is concentrated with greater than 100 pounds of

sulfuric trioxide; 2) the acid meets the definition of oleum; or 3) the sulfuric acid is in a container with flammable hydrocarbons. None of these three criteria apply to the PHPP; therefore, sulfuric acid is not State Regulated substance.

According to the CalARP regulations, the owner or operator of a facility that handles more than the threshold quantity of regulated substance(s) shall submit an RMP that reflects all covered processes at the facility. As noted above, aqueous ammonia will be stored and used at the Project in excess of the 500-pound threshold for ammonia defined by the regulation and, thus, a RMP will be prepared for the storage and use of aqueous ammonia. The administering agency is the CUPA, the LA County Fire Department HHMD.

California Building Code (CBC), CCR Title 24

The CBC is a compilation of three types of building standards from three different origins:

- Building standards that have been adopted by state agencies without change from building standards contained in national model codes;
- Building standards that have been adopted and adapted from the national model code standards to meet California conditions; and
- Building standards, authorized by the California legislature, that constitute extensive additions not covered by the model codes that have been adopted to address particular California concerns.

The CBC contains requirements regarding the storage and handling of hazardous materials. The Chief Building Official at the local government level (i.e., City of Palmdale Department of Building and Safety) must inspect and verify compliance with these requirements prior to issuance of an occupancy permit.

California Government Code Section 65850.2

Section 65850.2 restricts the issuance of an occupancy permit to any new facility involving the handling of acutely hazardous materials until the facility has submitted a RMP to the administering agency with jurisdiction over the facility.

Storm Water Pollution Prevention, Water Quality Order 97-03-DWQ, General Permit CAS000001 (operations) and Construction Activities Storm Water General Permit Order 99-08-DWQ

The PHPP will be subject to the statewide permit governing storm water runoff from industrial facilities. The permit requires implementation of a Storm Water Pollution Prevention Plan (SWPPP) overseen by the State Water Resources Control Board through its Regional Boards. The SWPPP describes the management of a variety of hazardous materials and, therefore, will have some bearing on hazardous materials management. The Project will prepare a SWPPP for both the construction phase and operational phase. The SWPPP is discussed in more detail in Section 5.17, Water Resources.

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65), HSC Section 25249.5 *et seq*.; CCR Title 22, Division 2, Part 2, Subdivision 1, Chapter 3 *et seq*.

Proposition 65 requires persons who emit/release certain chemicals that are known to the State of California to cause cancer or reproductive harm to provide warning to exposed persons, and prohibits these chemicals from being discharged into sources of drinking water. Certain exemptions apply for chemicals emitted in low quantities or low concentrations. The administering agency for Proposition 65 is the California Office of Environmental Health Hazard Assessment (OEHHA), although the program has no reporting requirements, and OEHHA has no inspection or direct oversight responsibilities for individual facilities. The Project will not use any chemical substances that contain Proposition 65-listed chemicals. Lead, a listed chemical, will be present in lead-acid batteries; however, worker and public exposure to lead is unlikely under normal circumstances. Proposition 65-listed chemicals may be emitted as combustion byproducts from the facility from combustion of natural gas in the facility combustion turbines, duct burners, boilers and heaters, or from diesel fuel combustion in the emergency engine; however, the emission levels are not expected to exceed Proposition 65 thresholds for which public notification would be required. The appropriate warning sings will be posted at the facility entrance, the entrance to any facility structures or areas in which Proposition 65 chemicals are stored, used, or released, and the appropriate training will be provided to employees.

5.6.1.3 Local LORS

City of Palmdale Code Section 8.04.400 Adoption of fire code.

The City of Palmdale has adopted and incorporated by reference Title 32, Fire Code, of the Los Angeles County Code, effective January 1, 2008, adopting the California Fire Code, 2007 Edition, published by the Building Standards Commission including Appendices as otherwise provided in said Title 32. This document constitutes and is cited as the “Palmdale Fire Code.”

5.6.1.4 Industry Codes and Standards

The Project will be designed to meet all applicable industry standards to reduce the risk of an accidental release, operated in a manner that complies with safety standards and practices, and maintained so as to provide a safe workplace for plant personnel and to prevent significant adverse offsite impacts to the public at large. In addition, Project construction and operation will incorporate up-to-date industrial technology and design standards, as well as established good industrial practices.

ASME, ANSI and ASTM Standards

ASME, ANSI and ASTM publish extensive codes and standards covering most aspects of power plant design and construction, ranging from piping to storage tanks to combustion turbines. There is no administering agency specifically for ASME, ANSI or ASTM code enforcement.

Uniform Fire Code, Articles 79, 80, and others

Article 80 includes provisions for storage and handling of hazardous materials. There is considerable overlap between this code and Chapter 6.95 of the California Health & Safety Code. The fire code does, however, contain independent provisions regarding fire protection and neutralization systems for emergency venting (see Section 80.303, D [compressed gases]). Article 4 establishes hazardous materials storage thresholds above which a permit is required. Article 79 identifies requirements for combustible and

flammable liquids. The administering agency for these requirements is the Los Angeles County Fire Department.

National Fire Protection Association (NFPA)

NFPA publishes standards for fire prevention. Several NFPA standards potentially apply to the construction, operation and maintenance of the facility, including standards for hydrogen technologies, installation of sprinkler protection, fire extinguishers, explosion prevention, flammable and combustible liquids use, fire prevention during welding and cutting, handling compressed gases, fire alarms, cooling towers, and construction standards for buildings and electrical facilities.

5.6.1.5 Permits Required and Permit Schedule

Environmental permits are not required for PHPP hazardous materials handling. However, the Project is required to file written plans related to hazardous material management and handling with the LA County Fire Department HHMD, including the HMBP and Cal-ARP RMP, as discussed above.

Once the Palmdale facility is constructed and prior to storing or using any hazardous materials, an inspection must be scheduled with the HHMD inspector. The inspector will evaluate the facility, the proposed hazardous materials, location of sensitive receptors and provide guidance to the applicant as to the type of RMP to be submitted to the HHMD. Under no circumstances are there to be any hazardous materials stored in the facility prior to the inspection and submittal of the RMP or the facility will be considered in violation. Once the RMP is completed and submitted, hazardous materials may be brought onsite. Additionally, the facility must be inspected and cleared by the fire inspector prior to occupancy and facility operation.

5.6.1.6 Involved Agencies and Agency Contacts

Agencies responsible for hazardous materials handling and agency contacts are provided in Table 5.6-2.

Table 5.6-2 Agencies and Agency Contacts

Agency Contact	Phone/E-mail	Permits/Plans/Issue
Peter Reich or Elizabeth Cox U.S. EPA Region IX 75 Hawthorne Street San Francisco, CA 94105	(415) 947-8000 reich.peter@epa.gov cox.elizabethm@epa.gov	SPCC, RMP
Occupational Safety and Health Administration (OSHA) Region IX 71 Stevenson Street, Room 420 San Francisco, CA 94105	(415) 975-4310	Hazardous material storage, worker safety
Cal-OSHA (San Bernardino) 464 W. 4th St., Ste. 332 San Bernardino, CA 92401	(909) 383-4321 fax (909) 383-6789	Hazardous material storage, worker safety
National Response Center	(800) 424-8802	Hazardous substance release notification

Agency Contact	Phone/E-mail	Permits/Plans/Issue
Randy Schulley, Chief Office of Emergency Services (OES) 3650 Schriever Ave. Mather, CA 95655	(916) 845-8510 (non-emergency) (800) 852-7550 (emergency) randy.schulley@oes.ca.gov	Hazardous substance release notification
Mike Plaziak Senior Water Resources Control Engineer Lahontan RWQCB, Victorville Office 14440 Civic Drive, Suite 200 Victorville, CA 92392	(760) 241-7325 mplaziak@waterboards.ca.gov	SWPPP
Los Angeles County Fire Department Health Hazardous Materials Division (CUPA)	(323) 890-4109 askhhmd@fire.lacounty.gov	RMP, HMBP, CUPA regulatory oversight
Shane Walter, Director City of Palmdale Department of Building and Safety 38250 Sierra Highway Palmdale, CA 93550	(661) 267-5353 swalter@cityofpalmdale.org	Occupancy Permit

5.6.2 Affected Environment

The PHPP will be developed on a 377-acre plant site that is currently undeveloped. The adjacent lands to the north across E Ave M from the plant site are in industrial and commercial use or undeveloped. Adjacent to the east and south is the secured Air Force Plant 42. West and adjacent is an undeveloped parcel owned by the City of Palmdale; further to the west are the Union Pacific rail line and Sierra Highway. The PHPP site will be closed to public access during both construction and operation.

5.6.2.1 Sensitive and Residential Receptors

A key consideration for a hazardous materials analysis is the proximity of sensitive receptors. Sensitive receptors, locations where a sensitive population segment such as children, elderly, or the infirmed may be exposed to emissions from the Project were identified and modeled within a three-mile radius of the Project. A network of residential and occupational receptors was also developed to identify the locations of the maximum exposed individual at an existing residential receptor (MEIR), and the maximum exposed individual at an existing occupational worker receptor (MEIW). Individual receptors identified and modeled in the study included residences, work-places, schools, daycares, and elderly care centers. As shown on Figure 5.10-1 in the AFC Public Health Section 5.10, the nearest sensitive receptor, the Lancaster Adult Day Healthcare Center, on E Avenue M and 4th St., is approximately one mile northwest of the Project's power block and approximately 1/3 mile northwest of the plant site boundary.

The nearest residential receptor to the site is approximately ¾ mile northwest of the center of the plant's power block and approximately ¼ mile north of the boundary of the power plant site on 7th St E.

5.6.2.2 Terrain and Meteorology

The Project site is located in the Mojave Desert which is classified as a “high desert”. It is a transition between the “hot” Sonoran Desert to the south and the “cold” Great Basin Desert to the north. Characteristic of a desert climate, the Mojave Desert has extreme daily temperature changes, low annual precipitation, strong seasonal winds, and mostly clear skies. The terrain in the vicinity of the Project site is generally flat.

Meteorological data characteristic of the Project site are available from Air Force Plant 42 (KPME, WMO ID 72382). The airport meteorological tower is located less than 1.5 miles from the Project plant site.

The area is characterized by very hot summer temperatures, with the mean maximum temperatures in June through August exceeding 80 degrees Fahrenheit (°F). Winter temperatures are more moderate, with mean maximum temperatures between 46°F and 56°F, and with lows between 39°F and 42°F during November through January. Minimum temperatures below freezing (32°F) occur on an average of about 80 days per year. The average annual precipitation is 7.90 inches for the period from 1931 through 2006, with approximately 74 percent of the precipitation each year occurring between December and March. There is, however, a summer thunderstorm season from July to September with occasional violent heavy precipitation that can produce flash flooding. June and July are the driest months with an average combined annual rainfall of 0.09 inches.

Large-scale weather patterns in the area are generally influenced by moderately intense anti-cyclonic circulation (e.g., associated with high pressure systems). During the summer, a large subtropical high pressure system off the coast of California, in combination with the rain shadow produced by the coastal ranges and the mountain ranges that border the Mojave Desert to the west and south, keeps the Mojave Desert area sunny and dry. However, the presence of a thermal low pressure area above the Mojave Desert promotes atmospheric transport from the Los Angeles Basin. During the winter months, the strength of the Pacific High pressure area wanes, and 20 to 30 frontal systems may pass through the area each year. Some of these frontal systems are sufficiently strong to produce rain in the area.

The prevailing winds for Palmdale, California, range from southerly to westerly approximately 75 percent of the time with the majority from the southwest based on wind data collected at the Palmdale Regional Airport. Calm periods occur 10.31 percent of the time, and the frequency of winds from north through south-southeast are each less than four percent. The most significant large-scale phenomena affecting air quality in the Project area are the transport winds from the northwest and southwest. These winds are responsible for bringing ozone and other pollutants through the mountain passes from the Los Angeles Basin (Cajon and Soledad Passes) and the San Joaquin Valley (Tehachapi Pass). Additional terrain and meteorology information is provided in Section 5.2, Air Quality.

5.6.3 Environmental Impacts

The anticipated direct, indirect and cumulative impacts from construction, operation and maintenance of the Project are addressed in the following subsections.

5.6.3.1 Significance Criteria

The hazards and potential adverse impacts on the public health, worker safety, or the environment associated with hazardous material storage and use as a result of the PHPP would be considered significant if any of the following conditions are met:

- Noncompliance with any applicable design code or regulation;
- Nonconformance to NFPA standards;
- Nonconformance to regulations or generally accepted industry practices related to operating policies and procedures concerning the design, construction, security, leak detection, spill containment, or fire protection;
- Significant increase in risk of fatality or serious injury;
- Substantial human exposure to a hazardous material;
- Significant exceedance of the OSHA exposure limits onsite; or
- Significant exceedance of the CEC or EPA risk management exposure endpoints offsite.

The first three significance criteria listed above are related to design codes, fire codes, and generally accepted industry practices. As discussed in Section 2.0, Project Description, and Section 5.18, Worker Safety, the PHPP will be designed to meet all applicable standards to reduce the risk of an accidental release, operated in a manner that complies with safety standards and practices, and maintained so as to provide a safe workplace for plant personnel and to prevent significant adverse offsite impacts to the public at large. In addition, as presented in AFC Appendix C, Engineering Design Criteria, Project construction and operation will incorporate up-to-date industrial technology and design standards; and also adhere to regulatory health and safety codes and guidelines; as well as established good industrial practices, and training, operating, inspection, and maintenance procedures that will minimize the risk and severity of potential upset conditions. Thus, since the Project will be constructed, operated, and maintained in accordance with applicable LORS, no further hazard analysis related to equipment design is required. The analysis of potential hazardous materials impacts presented in the following sections focuses on potential upset scenarios (e.g., accidental aqueous ammonia releases, chemical spills, or fire and explosion), that may result in risk of serious injury or substantial chemical exposure.

5.6.3.2 Construction

Hazardous materials that will be used during project construction include gasoline, diesel fuel, oil, lubricants, and small quantities of solvents and paint. There are no feasible alternatives to these materials for operation of construction vehicles and equipment. No acutely hazardous substances will be used or stored onsite during construction.

Diesel fuel is the hazardous material with the greatest potential for environmental consequences during the construction phase due to the use of diesel fuel in construction equipment, and the frequent refueling that may be required. To minimize the potential for a release, diesel fuel will not be stored onsite, except in equipment/vehicle fuel tanks. When refueling is required, a mobile fuel truck will be brought onsite to fuel each device. The fueling will be supervised by both the fuel truck and equipment operators. Any fuel spilled will be

promptly cleaned up, and any contaminated soil disposed of in accordance with the applicable State and Federal requirements.

Small volumes of hazardous materials will be temporarily stored onsite inside fuel and lubrication service trucks. Paints and solvents will be stored in flammable material storage cabinets. Maintenance and service personnel will be trained in handling these materials. The most likely incidents involving these hazardous materials would be associated with minor spills or drips. Impacts to the site workers, the public or the environment of a minor spill or leak will be mitigated through the emergency response training program and procedures that will be implemented by project construction contractors and employees, and by thoroughly cleaning up minor spills as soon as they occur. Soil contaminated by a spill or leak will be disposed in accordance with the applicable State and Federal requirements. There is minimal potential for significant adverse environmental impacts from hazardous material incidents involving other hazardous materials during construction.

5.6.3.3 Operation and Maintenance

Hazardous materials will be used and stored onsite during PHPP operations and maintenance. The hazardous material inventory, the general operational safety practices employed during hazardous material storage and use, the material-specific handling practices, and the toxicity of each hazardous material are discussed below.

Hazardous Material Inventory

A list of the large-quantity hazardous materials stored and used at the PHPP site along with the toxicity and storage practices for each material is provided in Table 5.6-3. For the purpose of this discussion, “large quantity” is defined as those chemicals stored or used in excess of 55 gallons for liquids, 500 pounds for solids and 200 cubic feet for compressed gases. These quantities coincide with the thresholds for reporting under California’s HMBP requirements.

Note: The boiler water treatment chemicals have not yet been selected for the Project, so the boiler treatment chemicals were grouped in Table 5.6.3 as “Boiler Water Treatment Chemicals.” The chemical information provided is typical for the types of chemicals used for boiler water treatment.

In addition to the chemicals listed in Table 5.6-3, small quantities (less than 55 gallons, 500 pounds or 200 cubic feet) of janitorial supplies, office supplies, laboratory supplies, paint, degreasers, herbicides, pesticides, air conditioning fluids (chlorofluorocarbons [CFC]), gasoline, hydraulic fluid, propane, and welding rods typical of those purchased from retail outlets may also be stored and used at the facility. These materials will be stored in the maintenance warehouse or office building. Flammable materials (e.g., paints, solvents) will be stored in flammable material storage cabinet(s) with built-in containment sumps. The remainder of the materials will be stored on shelves, as appropriate. Due to the small quantities involved, the controlled environment, and the concrete floor of the warehouse, a spill can be cleaned up without significant adverse environmental consequences.

Table 5.6-3 Summary of Special Handling Precautions for Large Quantity Hazardous Materials

Hazardous Material	Relative Toxicity[1] and Hazard Class[2]	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Natural Gas (methane)	Low toxicity; Hazard class – Flammable gas	None Established	No onsite storage, up to 140 lbs of natural gas in equipment and piping; pressurized carbon steel pipeline for delivery to site	Piping will be designed to U.S. Department of Transportation (DOT) specifications; onsite facilities (gas metering) will be designed and operated to industry standards. Pressure relief valves.
Hydrogen	Low toxicity; Hazard class – Flammable gas	None Established	In generator cooling loop 320 lbs, with maintenance inventory of 320 lbs in a "tube trailer"	Pressure safety tank, crash posts, pressure relief valves
Aqueous Ammonia (ammonium hydroxide), < 20% solution	High toxicity; Corrosive, Irritant	25 ppm (NIOSH)	Carbon steel tank (30,000 gal)	Spill containment, ammonia detectors and alarms and RMP
Sodium Hydroxide, 50% solution	High toxicity; Hazard class – Corrosive	PEL: 2 mg/m^3 (OSHA)	Carbon steel tank; 7,500 gal	Isolated from incompatible chemicals and secondary containment
Sodium Hypochlorite, 12.5% solution	High toxicity; Hazard class – Poison-B, Corrosive	Workplace Environmental Exposure Limit (WEEL) - STEL: 2 mg/m^3 PEL: 0.5 ppm (TWA), STEL: 1 ppm as Chlorine TLV: 1 ppm (TWA), STEL: 3 ppm as Chlorine	Plastic tank; 2,500 gal	Secondary containment
Sulfuric Acid, 93% solution	High toxicity; Hazard class – Corrosive, water reactive	PEL: 1 mg/m^3 (OSHA)	Lined, carbon steel tank (10,000 gal)	Isolated from incompatible chemicals, lined tank, and secondary containment

Hazardous Material	Relative Toxicity[1] and Hazard Class[2]	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Boiler Water Treatment Chemicals (e.g., organic phosphate inhibitors, disodium and trisodium phosphate)	Low to moderate toxicity; Hazard class varies by ingredient	Varies by ingredient	Plastic tank, maximum 4,000 gal, or inventory in plastic totes 330 gal, or 55-gal drums	Secondary containment
Carbon Dioxide	Low toxicity; Hazard class – Non flammable gas	TLV: 5,000 ppm (9,000 mg/m^3) TWA	Carbon steel cylinders, 24 tons maximum onsite, 6 tons in the largest container	Carbon steel tank with crash posts
Therminol VP-1 Diphenyl ether (73.5%) Biphenyl (26.5%)	Moderate toxicity, Hazard class – Irritant; Combustible Liquid (Class III-B)	Biphenyl = PEL: 0.2 ml/m^3 (8-hr TWA) TLV: 0.2 ml/m^3 (1 mg/m^3) (8-hr TWA) Diphenyl ether = TLV: 1 ml/m^3(8-hr TWA) TLV: 2 ml/m^3(15-min TWA) PEL: 1 ml/m^3 (7 mg/m^3) (15-min TWA)	260,000 gal in system, no additional storage	Continuous monitoring of pressure in piping network; routine inspections (sight, sound, smell) by operations staff; isolation valves throughout piping network to minimize fluid loss in the event of a leak; prompt clean up and repair.
Lube Oil	Low toxicity Hazard class – NA	None established	Carbon steel tanks, largest container 1,200 gal, 4,000 gal total in tank storage, maintenance inventory in 55-gallon steel drums	Secondary containment area for each tank and for maintenance inventory
Calcium Oxide (Lime)	Low toxicity; ORM-B	2 mg/m^3, 8-hour TWA	4,000 lbs maximum, 50-lb bags on pallets, mixed with water as needed in 2,000-gal fiberglass tank	Secondary containment for tank; dry, indoor storage for dry material
Mineral Insulating Oil	Low toxicity Hazard class – NA	None established	Carbon steel transformers, largest vessel 16,000 gal, total inventory 65,000 gal, no maintenance inventory onsite	Used only in transformers, secondary containment for each transformer

Hazardous Material	Relative Toxicity[1] and Hazard Class[2]	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Diesel Fuel	Low toxicity; Hazard class – Combustible liquid	PEL: none established TLV: 100 mg/m^3 (ACGIH)	Carbon steel tank (1,200 gal [generator]), Carbon steel tank (300 gal [fire-water pump engine])	Stored only in fuel tank of emergency engines, secondary containment.
Nitrogen	Low toxicity; Hazard class – Non flammable gas	None established	Carbon steel tank; 7,500 lbs total inventory	Carbon steel tank with crash posts
Hydraulic fluid	Low to moderate toxicity; Hazard class – Class IIIB combustible liquid	TWA (oil mist): 5 mg/m^3 STEL: 10 mg/m^3	Carbon steel tanks and sumps; 500 gallons in equipment, maintenance inventory of 110 gallons in 55-gal steel drums	Found only in equipment with a small maintenance inventory. Maintenance inventory stored within secondary containment.
Water treatment chemical NALCO Tri-Act 1800 Cyclohexlyamine (5 – 10%) Monoehtanolamine (10 – 30%) Methoxyproplyamine (10 – 30%)	High toxicity; Hazard class – Corrosive, Class II Combustible liquid	Cyclohexlyamine = TLV: 10 ppm (41 mg/m^3) Monoethanolamine = TLV: 3 ppm (7.5 mg/m^3) TWA: 3 ppm (7.5 mg/m^3) STEL: 6 ppm (15 mg/m^3) Methoxyproplyamine = TLV: 5 ppm TWA STEL: 15 ppm	Plastic totes, 2 x 400 gal	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO Elimin-Ox Carbohydazide (5 -10%)	Moderate toxicity; Hazard class – Sensitizer	Carbohydazide = PEL: none established	Plastic totes, 2 x 400 gal	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO 3D Trasar 3DT185 Phosphoric Acid (60 -100%)	High toxicity; Hazard class – Corrosive	Phosphoric acid = PEL: 1 mg/m^3 (TWA) TLV: 1 mg/m^3 (TWA), STEL: 3 mg/m^3	Plastic totes, 2 x 400 gal	Inventory management, isolated from incompatible chemicals and secondary containment

Hazardous Material	Relative Toxicity[1] and Hazard Class[2]	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Water treatment chemical NALCO 3D Trasar 3DT177 Phosphoric acid (30%)	Moderate toxicity; Hazard class – Irritant	Phosphoric acid = PEL: 1 mg/m^3 (TWA) TLV: 1 mg/m^3 (TWA), STEL: 3 mg/m^3	Plastic totes, 2 x 400 gal	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO 3D Trasar 3DT190	Low toxicity; Hazard class – Irritant	None established for mixture	Plastic totes, 2 x 400 gal	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO Acti-Brom (R) 7342 Sodium bromide	Low toxicity; Hazard class – Irritant	Sodium bromide = PEL: none established	Plastic totes, 2 x 400 gal	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO pHreedom® 5200M Sodium salt of phosphonomethylated diamine	Low to moderate toxicity; Hazard class – Irritant	Sodium salt of phosphonomethylated diamine = PEL: none established	Plastic totes, 2 x 400 gal	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO PCL-1346	Low toxicity; Hazard class – Irritant	None established for mixture	Plastic totes, 2 x 400 gal	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO Permacare (R) PC-7408 Sodium bisulfite	Low toxicity; Hazard class – Irritant	Sodium bisulfite = PEL: none established: TLV: 5 mg/m^3 TWA	Plastic totes, 2 x 400 gal	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO BT-3000 Sodium hydroxide Sodium tripolyphosphate	High toxicity; Hazard class – Corrosive	Sodium hydroxide = PEL: 2 mg/m^3 Sodium tripolyphosphate = PEL: none established	Plastic totes, 2 x 400 gal	Inventory management, isolated from incompatible chemicals and secondary containment

Hazardous Material	Relative Toxicity[1] and Hazard Class[2]	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Water treatment chemical NALCO 8338 Sodium nitrite Sodium tolytriazole Sodium hydroxide	Moderate toxicity; Hazard class – Toxic	Sodium nitrite = PEL: none established Sodium tolytriazole = PEL: none established Sodium hydroxide = PEL: 2 mg/m^3	Plastic totes, 2 x 400 gal	Inventory management, isolated from incompatible chemicals and secondary containment
Welding gas Acetylene	Moderate toxicity; Hazard class – Toxic	PEL: none established	Steel cylinders; 200 cubic ft each, 800 cubic ft total onsite	Inventory management, isolated from incompatible chemicals,
Welding gas Oxygen	Low toxicity; Hazard class – Oxidizer	PEL: none established	Steel cylinders; 200 cubic ft each, 800 cubic ft total onsite	Inventory management, isolated from incompatible chemicals
Welding gas Argon	Low toxicity; Hazard class – Nonflammable gas	PEL: none established	Steel cylinders; 200 cubic ft each, 800 cubic ft total onsite	Inventory management
Fertilizer Urea	Low toxicity; Hazard class – NA	WEEL: 10 mg/m^3, 8-hour TWA	Stored in bags (dry pellets), 5 x 50-lb, 250 lbs total inventory	Inventory management, indoor storage
Fertilizer Monopotassium phosphate	Low toxicity; Hazard class – Irritant	TLV: 10 mg/m^3 (inhalable) 8-hr TWA, 3 mg/m^3 (respirable) 8-hr TWA PEL: 15 mg/m^3 (total dust) 8-hr TWA, 5 mg/m^3 (respirable) 8-hr TWA	Stored in bags (dry pellets), 5 x 50-lb, 250 lbs total inventory	Inventory management, indoor storage
Herbicide Roundup® or equivalent	Low toxicity; Hazard class – Irritant	Isoproplyamine salt of glyphosphate = no specific occupational exposure has been established	No onsite storage, brought onsite by licensed contractor, used immediately	No excess inventory stored onsite

Hazardous Material	Relative Toxicity[1] and Hazard Class[2]	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Soil stabilizer Active ingredient: acrylic or vinyl acetate polymer or equivalent	Non-toxic; Hazard class – NA	None established	No onsite storage, supplied in 55-gal drums or 400-gal totes, used immediately	No excess inventory stored onsite

[1] Low toxicity is used to describe materials with an NFPA Health rating of 0 or 1. Moderate toxicity is used describe materials with an NFPA rating of 2. High toxicity is used to describe materials with an NFPA rating of 3. Extreme toxicity is used to describe materials with an NFPA rating of 4.

[2] NA denotes materials that do not meet the criteria for any hazard class defined in the 1997 Uniform Fire Code.

General Operating Practices

Chemicals will be stored or processed in vessels or tanks specifically designed for their individual characteristics. All hazardous materials storage or process vessels will be designed in conformance with applicable ASME codes. Large quantity (bulk) liquid chemicals will be stored outdoors in aboveground storage tanks (ASTs) manufactured of carbon steel or plastic, or in 400-gallon (nominal) capacity plastic totes. Spill containment structures (e.g., curbing, double walled tanks, or equivalent) to contain the chemicals in the event of a leak or spill will be constructed around each of the large-quantity hazardous chemical storage tanks or totes. Bulk storage tanks or totes containing sulfuric acid, sodium hydroxide, sodium hypochlorite, and the various water treatment chemicals each will have secondary containment structures capable of holding the tank or tote volume plus an allowance for precipitation (25-year, 24-hour rain event). Concrete containment structures will be coated with a chemical resistant coating (e.g., epoxy) to ensure long-term integrity of the containment structure.

Small quantity chemicals will be stored in their original delivery containers in order to minimize risk of upset. Personnel working with chemicals will be trained in proper handling technique and in emergency response procedures for chemical spills or accidental releases. Personal protection equipment (PPE) will be provided.

Appropriate safety programs will be developed to address hazardous materials storage and use, emergency response procedures, employee training requirements, hazard recognition, fire safety, first-aid/emergency medical procedures, hazardous materials release containment/control procedures, hazard communications training, PPE training and release reporting requirements. These programs include Injury and Illness Prevention Program (see Section 5.18, Worker Safety), fire response program, plant safety program and facility standard operating procedures. As required under Federal and California regulations, a HMBP will be prepared and submitted to the LA County Fire Department HHMD.

The Project will be subject to the SWPPP requirements administered by the State Water Resources Control Board under the Storm Water General Permit. The SWPPP will describe the management practices in place at the facility (e.g., regular inspections and maintenance of drainage facilities, employee training in proper hazardous material storage and handling procedures, and chemical spill response procedures) to prevent the release or discharge of hazardous materials to the waters of the State (see also discussion in Section 5.17, Water Resources). A preliminary Draft Erosion and Sediment Control Plan (DESCP) to meet CEC requirements is provided in Appendix L. With the implementation of the operating practices and programs described above, potential impacts from the use or storage of hazardous materials during operations will be less than significant.

Chemical-Specific Operating Practices and Chemical Toxicity

Substance-specific operating practices and toxicity issues are described in the following paragraphs.

Fuel Gas Delivery. A new 8.7-mile natural gas supply pipeline traveling north from its origin just east of the intersection of 10th and S Streets in the City of Palmdale and buried in disturbed road shoulders will supply gas to the Project. There will be no onsite storage of natural gas. A total of approximately 140 pounds of natural gas will be present onsite in the pipelines and equipment. Natural gas consists mainly of methane

(approximately 95 percent). Methane is a flammable gas with a NFPA hazard rating of 4 (NFPA 1994) with low toxicity.

Compressed Gas Storage. Hydrogen will be used as a generator coolant for the Project. A maximum of 640 pounds of hydrogen (approximately 320 pounds in the generator cooling loop plus 320 pounds in storage tanks in a portable rack known as a "tube trailer") may be present onsite at any one time. The hydrogen tanks on the tube trailers are DOT-specification tanks, capable of withstanding the normal abuse of highway travel and all but the very worst vehicular collisions without release. In addition, the tube trailers will be located outside, remote from the combustion turbine generators, away from electrical lines and other potential ignition sources as required by applicable building and fire codes. The hydrogen tanks also will be protected from vehicular impact by installation of crash posts or other protective measures. While parked at the facility, the tanks have a very low risk of failure. Hydrogen is a flammable gas with a NFPA hazard rating of 4 (NFPA 1994), and low toxicity.

Similar to most recently designed and/or constructed solar thermal plants, the HTF expansion tank will be blanketed with nitrogen gas to render the headspace in the expansion tanks non-explosive. With most solar thermal plants, when the HTF heats and expands, the nitrogen gas blanket is displaced and vented to atmosphere, usually through emission control equipment such as activated carbon because it is potentially saturated with volatile organic compounds (VOC). However, unlike other solar thermal plants, the PHPP will use a closed vapor system for the HTF expansion tanks. With the PHPP system, when the HTF heats and expands, the VOC-saturated nitrogen that is displaced is captured, compressed, and stored in a small pressurized tank. When the HTF cools and contracts, the nitrogen is replaced from this pressurized tank. This design serves to conserve nitrogen and eliminates VOC emissions from the expansion tanks. The initial nitrogen blanket and any nitrogen added to the expansion tanks to replace losses is supplied from compressed gas cylinders.

Other compressed gases stored and used at the facility may include gases typically used for maintenance activities, such as shop welding and calibration gases for the emissions monitoring equipment. These gases include acetylene, argon, carbon monoxide, nitric oxide, nitrogen and oxygen. In addition, carbon dioxide is used as a fire suppression agent in the turbine enclosures.

Acetylene is a flammable gas and narcotic; it is highly reactive and has low toxicity. Oxygen is a powerful oxidizer with low toxicity. Nitrogen, carbon dioxide and argon have low toxicity but may cause asphyxiation if released in a confined area. Carbon monoxide is a flammable gas with moderate toxicity. Nitric oxide is a Poison-A. The potential impacts presented by the use of these gases at the Project are less than significant based on the following site-specific conditions:

- Compressed gases will be stored in small containers at the facility (typically 200 cubic feet per gas cylinder), and the total quantity will be kept to the minimum required for operation and maintenance.
- The compressed gases will be delivered and stored in DOT-approved safety cylinders, and secured by chains to prevent tipping and physical damage.
- The compressed gases will be stored in an isolated storage area surrounded by crash posts to minimize potential for accidents or upset.
- Incompatible gases (e.g., flammable gases and oxidizers) will be stored in separate, isolated areas.
- Operators trained in the proper use of equipment and materials.

Storage of compressed gases in standard portable cylinders, rather than a single larger cylinder will limit the maximum quantity released from an individual cylinder to less than 200 cubic feet in the unlikely event of a cylinder failure, and this small amount would not have significant offsite consequences.

Aqueous Ammonia. Aqueous ammonia (less than 20 percent concentration by weight of ammonia) will be the only chemical stored in sufficient quantities at the PHPP to be classified as a regulated substance subject to the requirements of the CalARP RMP program.

SCR systems with aqueous ammonia injection will be used to control NOx emissions in the stack exhaust. NOx emissions control can be accomplished using either anhydrous ammonia (an undiluted almost pure form of ammonia) or aqueous ammonia (a water solution of lower concentration). The selection of the less hazardous form of ammonia (aqueous rather than anhydrous) is one major means for mitigating potential hazards of an accidental spill. Since it is of much lower concentration, a potential aqueous ammonia spill would have a much lower impact than an equivalent size anhydrous ammonia spill. Because the ammonia is diluted with water, the ammonia vapor pressure will be lower than anhydrous ammonia, resulting in a lower evaporation rate, which also reduces the potential offsite impact. In order to have the same amount of ammonia available for use in NOx control, aqueous ammonia requires more tanker truck shipments than anhydrous ammonia because of its lower concentration. Aqueous ammonia was selected over anhydrous ammonia for the Project in order to reduce the severity of any potential ammonia accident.

Aqueous ammonia will be stored onsite in a 30,000-gallon pressure vessel (tank). Industry practice is to limit the amount of aqueous ammonia to 85 percent of the maximum capacity of a storage tank, which is 25,500 gallons for this tank. Pressurized metallic storage tanks have a mean time to catastrophic failure of 0.0109 per million hours of service, or on average, one failure every 10,500 years (Center for Chemical Process Safety, 1989). Thus, failure of a pressurized aqueous ammonia storage tank during the lifetime of the facility is unlikely. The CEC has noted this in prior AFCs and regards catastrophic rupture of an ammonia tank as not a credible spill scenario. The ammonia storage tank will be surrounded by a spill containment structure to hold the entire capacity of the tank plus an additional volume to contain a 25-year, 24-hour storm event. For this analysis, 10 percent excess capacity is used to approximate a 25-year, 24-hour storm event in the project area.

The containment vessel drains to an underground sump that can hold the entire contents of the containment structure (110 percent of the ammonia tank's capacity). The inlet to the sump has an opening two feet by two feet in size. Any ammonia spilled from the storage tank will immediately drain into the sump with only a limited surface (four square feet) exposed to the atmosphere.

The aqueous ammonia storage and handling facilities will be equipped with continuous tank level monitors, temperature and pressure monitors and alarms, excess flow and emergency island valves, and a steel-reinforced concrete containment structure surrounding the tank and piping. An ammonia vapor detection system will be installed to allow rapid detection and quick response to any accidental spill of ammonia. Only trained technicians will conduct system maintenance and repairs.

Aqueous ammonia typically will be delivered to the facility in 8,000-gallon tank trucks. Tank trucks will be unloaded in a tank truck unloading area immediately west of the ammonia tank. The unloading area is paved with concrete and surrounded by a curb. The unloading area drains west into the ammonia tank containment structure, and then into the underground sump. Consequently, any ammonia spilled during the

tank loading process will immediately drain into the underground sump with only a limited surface (four square feet) exposed to the atmosphere. The edge of the ammonia unloading area is more than 1,000 feet from the nearest facility fence line.

During unloading operations, the driver performing the unloading operation will wear protective equipment including respiratory protections, and will have a cut-off switch to stop the chemical transfer in case of an emergency. The offloading operation will also be monitored by a control room operator via camera to be able to provide backup support if there is a leak, hose break, or other accident during unloading.

With respect to the transport of ammonia to the Project site, DOT regulations require all truck tank trailers to meet strict requirements for collision and accident protection. Hazardous materials shipments will comply with applicable regulations in terms of route selection, operator training and qualifications, etc. The tank trucks are designed to withstand violent accidents without breach of containment. Project truck travel will include approximately 15 deliveries per month of hazardous materials, 14 of which will be aqueous ammonia. It is expected that hazardous materials shipments would utilize SR 14 to access the PPHP site from the south.

The frequency for serious hazardous material incidents involving large trucks is approximately 0.0022 per million vehicle miles (DOT, 2004). Assuming a one-way trip distance to the PHPP of 100 miles from the Los Angeles Basin to deliver ammonia, a truck capacity of 8,000 gallons, and an estimated 168 trucks deliveries per year of aqueous ammonia, an accident would be expected to occur approximately once every 30,000 years. Thus, a release of aqueous ammonia from the delivery truck during the lifetime of the facility is unlikely.

As noted previously, a CalARP RMP will be prepared for the PHPP for the storage and use of aqueous ammonia. The RMP will be based on studies identifying potential hazards associated with the handling of aqueous ammonia at the facility, including a hazards analysis, a seismic assessment, an offsite consequence analysis, and recommendations for ammonia system improvements that result from the studies. The RMP will address in detail the emergency planning and response actions in the event of an ammonia release from the facility, including emergency response plans and training procedures. The RMP will be submitted to the local CUPA for review.

The probability of a catastrophic release of aqueous ammonia during Project operations is very small. The low release probability is a result of a number of factors, including the stringent design standards for pressurized storage vessels, the mitigation measures that will be built into the ammonia system at the PHPP, and the chemical accident prevention program elements that the project will establish to comply with the requirements of the CalARP and RMP accident prevention programs. As a result of the foregoing, potential impacts associated with the use and storage of ammonia onsite will be less than significant. In addition, as discussed in Section 5.6.3.3, the worst-case release scenarios evaluated showed no offsite impacts.

Other Large Quantity Hazardous Materials. Storage of large quantities of sulfuric acid (10,000 gallons), sodium hydroxide (7,500 gallons), and sodium hypochlorite (2,500 gallons) will require special precautions, due to their corrosive natures. Each of the chemicals will be stored in a lined, carbon steel or plastic tank to minimize the potential for catastrophic failure of the tank. A spill containment structure surrounding each storage tank will also be provided in order to contain spills and leaks. The spill containment area will be coated with a corrosive-resistant material such as epoxy. Sulfuric acid is corrosive and water reactive.

Although sulfuric acid is highly toxic, due to the low vapor pressure, it is typically hazardous only by direct physical contact. Sodium hydroxide is corrosive. Although sodium hydroxide is highly toxic, due to the low vapor pressure, it is typically hazardous only by direct physical contact. Sodium hypochlorite is highly toxic, corrosive and a Poison-B.

Boiler water treatment chemicals include the following four types of chemicals: organic phosphate inhibitor (1,200 gallons); disodium and trisodium phosphate (1,200 gallons); neutralizing amine (250 gallons); and oxygen scavenger (250 gallons). These chemicals will be stored in plastic tanks or totes, which will be provided with secondary containment sufficient to hold the full stored contents. The toxicity of each mixture is low, however, the toxicity of any individual specific ingredient of the mixture may be higher.

Detergent is used periodically to clean the combustion turbines. The detergent is purchased in 55-gallon plastic drums or 330-gallon plastic totes, and may be diluted with water prior to use. The detergent is brought onsite only when required for maintenance. The detergent has low toxicity and does not meet the criteria for any hazard class defined by the UFC.

Heat Transfer Fluid. Therminol VP-1™ (or an equivalent) is the HTF that will be used in the solar component of the Project. Approximately 260,000 gallons of Therminol are present in the solar system, but because of its relatively high freezing point (54°F), Therminol will not be stored onsite outside of quantities contained within the solar system itself. The heat transfer system is a closed loop. A fluid leak in the system will be detected immediately and the maintenance department will promptly repair any leak, thereby, minimizing the volume of any leak. Therminol is a synthetic oil consisting of diphenyl ether and biphenyl. Biphenyl has a CERCLA Reportable Quantity of 100 pounds; approximately 377 pounds (42 gallons) of Therminol contains the Reportable Quantity of biphenyl. Therminol is moderately toxic, a skin irritant, and a Class III-B combustible liquid. The Material Safety Data Sheet (MSDS) for Therminol is provided in Appendix D of the AFC.

Petroleum Products. Lube oil is stored in 1,200-gallon carbon steel tanks associated with each turbine. The turbine enclosures provide secondary containment sufficient to hold the full contents of the tanks. The tanks are inspected daily to ensure that they are not leaking. Lube oil has low toxicity and does not meet the criteria for any hazard class defined by the UFC.

Diesel fuel will be used to fuel the emergency fire water pump and emergency diesel generator engines. The fire water pump engine has a 300-gallon fuel supply, and the emergency generator has a 1,200-gallon fuel supply in a carbon steel tanks. The equipment skid provides secondary containment that can hold the full amount of the fuel. Diesel is a combustible liquid with low toxicity.

Insulating oil is used in each of the 13 electrical transformers at the facility. The oil capacity ranges from 275 gallons for the smallest transformer to 16,000 gallons for the largest transformer, with a total quantity of insulating oil present of 65,000 gallons. Each transformer is installed in a secondary containment structure that will contain 100 percent of the transformer capacity plus an allowance for precipitation.

Due to the storage of petroleum products in quantities exceeding 1,320 gallons in above ground storage and in the transformers, lube oil sumps and fuel tank, the PHPP will prepare an SPCC Plan. The SPCC Plan will describe the storage of oil, the spill prevention measures employed by the facility, the potential consequences of a spill, and spill response measures developed by the facility to respond to an oil spill.

The SPCC Plan will also describe the inspection and monitoring performed by the facility associated with oil storage. SPCC requirements are discussed in more detail in Section 5.17, Water Resources. With the implementation of the SPCC, potential impacts related to an oil spill will be less than significant.

Herbicide. Herbicide will be used in the solar field to kill weeds in order to minimize the fire potential. PHPP plans to contract the weed control program to an outside contractor, thus herbicide will not be stored onsite, but rather will be brought onsite on an as-needed basis. PHPP will ensure that the contractor has the appropriate licenses and a robust safety programs for its employees.

Soil Stabilizer. The facility will apply a polymer dust suppressant/soil stabilizer periodically, as required, to reduce fugitive dust emissions in the solar field. "Soil Sement" or an equivalent soil stabilizer will be used for this purpose. Soil stabilizers usually consist of water emulsions of acrylic or vinyl acetate polymers. These products are non-toxic and do not meet the definition of any hazard classification.

Small Quantity Hazardous Materials. In addition to the chemicals listed in Table 5.6-3, small quantities (less than five gallons) of paints, oils, grease, solvents, pesticides, detergents, and janitorial supplies typical of those purchased at a retail hardware store may also be stored and used at the facility. These materials will be stored in the Maintenance Shop. Flammable materials (e.g., paints, solvents) will be stored in flammable material storage cabinet(s) with built-in containment sumps. The remainder of the materials will be stored on shelves, as appropriate. Due to the small quantities involved, the controlled environment, and the concrete floor of the shop, a spill can cleaned up without significant environmental consequences.

Hazardous Material Transportation. With the exception of natural gas that will be delivered to the Project site via pipeline, hazardous materials will be delivered to the Project site via truck along SR-14 and then into the gated and fenced site via the plant access road. SR 14 is currently used for the transport of hazardous materials; the Project will cause a less than significant increase in hazardous material traffic along this route. Traffic and transportation issues are discussed in more detail in Section 5.13, Traffic and Transportation.

Offsite Consequence Analysis

Aqueous ammonia is a regulated substance that has the potential for offsite risk if released. Risk has two components - frequency and severity. The more often a particular mishap is likely to occur and the more hazardous the material involved in the mishap, the higher the risk. Risk can be reduced by reducing either the frequency of occurrence, the severity of the release, or both in combination. As discussed, the applicant has elected to operate the facility using aqueous ammonia for NOx emissions control, rather than the more hazardous anhydrous ammonia. This choice leads to more frequent ammonia deliveries, increasing the probability of a release, but significantly reducing the severity from a potential release.

Methodology. The methodology and assumptions used for the offsite consequence analysis are summarized below.

The CEC has defined four benchmark exposure levels for ammonia. These bench mark exposure levels are: 1) lethal, 2) immediately dangerous to life and health, 3) the RMP endpoint required by EPA and the State of California, and 4) a level considered to be without serious adverse effects on the public. The ammonia levels corresponding to the four CEC benchmark criteria are 2,000 ppm, 500 ppm, 200 ppm, and 75 ppm, respectively. A significant impact is defined as an offsite ammonia concentration exceeding 75 ppm.

The EPA guidance document "Risk Management Program Guidance for Offsite Consequence Analysis" (EPA, 1999) provides the methodology that was used to estimate the ammonia flux from the ammonia storage tank containment sump for both the worst-case and the alternative release scenarios. Using the estimated ammonia flux, the dispersion of ammonia was estimated using a ambient air quality modeling analysis, SCREEN3. SCREEN3 was used to determine the distance from the release area that the ammonia concentration equals the endpoint concentrations identified above. The two potential release scenarios that were evaluated are:

- Worst-case Release - Catastrophic Failure of the Ammonia Storage Tank
- Alternative-case Release - Truck Unloading Accident, Loss of Less than Truckload

Worst-case Release. EPA has defined worst-case for use in offsite consequence analyses under the RMP program (EPA, 1999). Identical assumptions are required under the CalARP RMP program. For aqueous ammonia, EPA defines the worst-case release as the instantaneous release of the entire contents of the storage vessel and the evaporation of ammonia from the surface of the resulting pool of ammonia. Passive mitigation such as a containment structure may be taken into account in the analysis. The meteorological conditions that apply for the worst-case release are very stable atmospheric dispersion conditions, "F" stability, typical of nighttime conditions, and a wind speed of 1.5 meters per second. The temperature of the liquid is assumed to be the highest maximum temperature in the past three years. The ambient temperature is used to estimate the vapor pressure of ammonia, a critical parameter for estimating ammonia evaporation rate from the pool.

The CEC staff has previously determined that the catastrophic breach of an ammonia tank is not a credible accident. However, the worst-case scenario is based on a pool surface equal to the dimensions of the containment structure. A release of less than the full ammonia tank into containment would also be likely to produce a liquid pool covering the entire floor of the containment structure, thus resulting in a similar initial ammonia evaporation rate. Therefore, it is appropriate to assume that the exposed surface area of the containment sump of four square feet is covered with aqueous ammonia. The worst-case scenario is assumed to occur at night. For this analysis, the maximum temperature recorded of 108ºF (42.2ºC) in a recent three-year period (2002 to 2004) at Plant 42 was assumed, resulting in a very conservative estimate of the emission rate and dispersion characteristics.

The default assumptions used for calculating the ammonia flux assumes an ambient temperature of 77°F. Because the actual maximum temperature used for this analysis is 108°F, the flux calculations were completed in accordance with the alternate method developed by the USEPA for high-temperature water solutions from Appendix D of the guidance. The equation used is:

$$QR = (0.284 \times U^{0.78} \times MW^{2/3} \times A \times VP/(82.05 \times T) \qquad \text{(Eq. 5.6-1)}$$

Where:

QR = Evaporation rate (pounds per minute)

U = Wind speed (meters per second) = 1.5 m/sec

MW = Molecular weight of the ammonia = 17 lbs/lb-mol from Appendix B-3 of the guidance

A = Surface area of pool formed by the entire quantity of the mixture (square feet) = 4 square feet

VP = Vapor pressure (mm Hg) = 550.1 mmHg adapted from Perry 1984 for 20% aqueous ammonia

T = Temperature of released substance (Kelvin [K]) = 315.4°K

Using the above parameters, the ammonia flux rate for the worst case release scenario was calculated to be 0.22 pounds of ammonia per minute.

The dispersion of ammonia was determined using SCREEN3 and the calculated ammonia flux. The assumptions used in SCREEN3 were:

- Rural dispersion characteristics;
- The regulatory default mixing height was selected;
- The regulatory default of 10 meters was selected for the anemometer height;
- Simple terrain was selected.

SCREEN3 provided the distance from the release point where each regulatory concentration would be reached.

Alternative-case Release. For the alternative-case release, EPA allows use of more typical meteorological conditions: neutral atmospheric dispersion conditions ("D" stability) and a wind speed of 3.0 meters per second, or other representative meteorological conditions for the geographic area where the release is posited. For the alternative release, the ambient temperature at the time of the spill was also assumed to be the five-year maximum temperature of 108ºF.

The alternative release scenario assumes a contained 10-minute release from a loading hose separation during an ammonia delivery. Hose separation could be caused by either a hose rupture or a disconnection of the hose at a coupling point. The truck unloading area will have a berm and sloped drainage to capture and route all ammonia spilled in the truck unloading area into a collection trench that directs the ammonia to an underground sump capable of holding the entire truck contents of 8,000 gallons. The opening of the sump is approximately four square feet. Because the spill is assumed to be contained, and the ammonia flux is determined by the exposed surface area, ammonia concentration, and temperature, the release rate from the hose does not factor into the dispersion estimate. From Equation 5.6-1 above, the alternate case flux was calculated to be 0.37 pounds of ammonia per minute. The same assumptions listed above were used for the alternate scenario SCREEN3 modeling analysis.

Offsite Consequence Analysis Results. Table 5.6-4 presents the SCREEN3 modeling results for the two ammonia release scenarios described. Neither of the two postulated releases produce an exceedance of the 75 ppm significance threshold that extends offsite. Thus, no schools, hospitals, other sensitive receptors, or residences are within the impact zone of either postulated release.

Given the highly conservative assumptions inherent in the RMP emission estimation scenarios, including the inherent assumption of the highest 5-year temperature occurring at night, it is unlikely that a real world accident would produce an actual impact distance that would approach the modeled worst-case distance. As a result, potential project offsite impacts related to an accidental ammonia release are less than significant.

Table 5.6-4 Ammonia Release Scenario Results

Scenario	Significance Level (ppm)	Distance to Threshold[1]		Population Exposed
		(m)	(miles)	
Worst-Case Release Catastrophic Failure of Storage Tank Nighttime release with F-stability, 1.5 m/s wind speed, 42.2ºC	75	80	0.05	0
	200	45	0.03	0
	500	26	0.02	0
	2,000	10	0.01	0
Alternative-Case Release Truck Unloading Accident Daytime release with D-stability, 3.0 m/s wind speed, 42.2ºC	75	34	0.02	0
	200	20	0.01	0
	500	10	0.01	0
	2,000	4	0.002	0

[1] All distances are within the site boundaries

Fire and Explosion Risks

The proposed Project will utilize three materials that pose potential risks of fire and explosion because of their flammability. These are natural gas, HTF and hydrogen, each of which is discussed below.

Natural Gas. Natural gas, which will be used as a fuel for the combustion turbines, duct burners, heater and boiler at the facility, poses a fire and/or explosion risk as a result of its flammability. Natural gas will be delivered to the site via pipeline owned and operated by Southern California Gas Company and will not be stored onsite. The potential risk of a natural gas pipeline rupture will be reduced to insignificant levels through adherence to applicable codes and the development and implementation of appropriate operational procedures that are standard in the industry. The risk of a fire and/or explosion is not considered to be a significant risk by the CEC staff. (CEC, 1999).

Hydrogen. Hydrogen will be used as a generator coolant for the Project. Hydrogen is a flammable gas with a NFPA hazard rating of 4 (NFPA, 1991). A maximum of 320 pounds of compressed hydrogen in the generator cooling loop, plus 320 pounds in a tube trailer, may be present onsite at any one time. The hydrogen tanks on the tube trailer are DOT-specification tanks, capable of withstanding the normal abuse of highway travel, and all but the very worst vehicular collisions. In addition, the tube trailer will be located outside, remote from the combustion turbine generators, and away from electrical lines and other potential ignition sources, as required by applicable building and fire codes. The hydrogen tanks also will be protected from vehicular impact by installation of crash posts or other protective measures. Location of the hydrogen tube trailers as described above, coupled with operations consistent with electric power industry design and safety standards, present a negligible risk of explosion or fire.

Heat Transfer Fluid (HTF). The HTF is used in the solar collectors. The solar radiation heats the HTF to approximately 780°F. The hot HTF is pumped through heat exchangers to generate steam. HTF is potentially flammable if released in vapor form at these high temperatures. If HTF leaks from the system during the sunlight hours, the facility operators will utilize leak detection “Lessons Learned” from the existing SEGS plants. Based on operating experience at SEGS, a leak of Therminol HTF is readily visible as a

vapor cloud and will have a detectable odor as well. This detection method is currently being used at the existing SEGS plants ands has been their primary source of detection for many years. Importantly, leaks of HTF at the PHPP will be detected using flow and/or pressure sensors in the process piping.

The solar field's HTF system piping will include multiple piping loops with individual isolation valves. The system will incorporate the use of sensors capable of detecting flow and pressure, located at the input and output collectors of each section of HTF piping loop. If the recorded flow or pressure of a specific HTF piping loop exceeds the normal operating range, computerized plant monitoring software will trigger an alarm, trip the applicable VFD pump and isolate the affected portion of the solar field, thereby immediately stopping the flow of HTF to the leak area. Control room operators will be able to monitor VFD pump discharge pressure and flow. The system employs an algorithm that continuously checks the system's operational status.

The detection of small volume leaks will involve automatic recordation of temperature, pressure and volume in the HTF holding tank. The monitoring system would be based on recorded tank levels at peak daily operating temperatures and overnight shut-down tank levels (the common operating points). If there is a small leak it will manifest itself as a drop in the level of HTF in the holding tank compared to the benchmarks that have been established during the initial days of the system's operation. By comparing these printouts on a daily basis, the operators will be able to detect small variations that would be associated with slight leaks in the HTF system.

The system will also use fixed pole mounted Photo Ionization Detectors (PIDs) located on the downwind side of the solar field. These units are capable of detecting fugitive HTF molecules during daytime or nighttime conditions.

Seismic Risk

The possibility exists that an earthquake could cause the failure of a hazardous materials storage tank or HTF piping somewhere in the solar field. An earthquake could also cause the failure of the secondary containment system (berms and dikes), as well as electrically controlled valves and pumps. The failure of all these preventive control measures might then result in a vapor cloud of hazardous materials that could move off site and impact residents and workers in the surrounding area. The effects of the Loma Prieta earthquake of 1989, the Northridge earthquake of 1994, and the earthquake in Kobe, Japan, in January 1995, heighten concerns about earthquake safety.

Information obtained after the January 1994 Northridge earthquake showed that some damage was caused to several large and small storage tanks at the water treatment system of a cogeneration facility. The tanks with the greatest damage, including seam leakage, were older tanks, while newer tanks sustained lesser damage with displacements and attached line failures. The CEC conducted an analysis of the codes and standards which should be followed to adequately design and build storage tanks and containment areas that could withstand a large earthquake. CEC staff also reviewed the impacts of the February 2001 Nisqually earthquake near Olympia, Washington, a state with similar seismic design codes to California. No hazardous materials storage tanks were impacted by this quake. (CEC, 2007)

PHPP facilities will be designed and constructed to the applicable standards of the 2007 CBC for Seismic Zone 4 (see Section 5.5, Geologic Resources and Hazards and Section 2.0, Project Description). Based on the experience from the Northridge and other earthquakes, when tanks are constructed to current codes

and standards, tank failures during seismic events are not likely and do not represent a significant risk to the public.

The piping in the solar array contains the vast majority of the HTF and the solar field will not be constructed with secondary containment. However, it is very unlikely that an earthquake could cause the failure of the piping in the solar array resulting in a loss of HTF that would have an offsite impact. The piping in the solar array will be specifically constructed to allow movement due to thermal expansion – the steel piping in the mirrored trough sections of the array is connected to the HTF distribution headers with ball joints and the piping is not rigidly mounted to foundations or other structures. Further, the solar array will be constructed with isolation valves to limit the HTF losses in the event of a piping failure. Due to these inherent design features, piping failures during seismic events are not likely and do not represent a significant risk to the public.

5.6.3.4 Facility Closure

Premature closure or unexpected cessation of facility operations will be outlined in the facility's closure plan. The plan will outline steps to secure hazardous and non-hazardous materials and wastes. Such steps will be consistent with best management practices and the HMBP and according to applicable LORS. The plan will include monitoring of vessels and receptacles of hazardous material and wastes, safe cessation of processes using hazardous materials or hazardous wastes, and inspection of secondary containment structures.

Planned permanent closure impacts will be incorporated into the facility closure plan and evaluated carefully near the end of the PHPP operational life. The facility closure plan will document nonhazardous and hazardous waste management practices including the inventory, management, and disposal of hazardous materials and wastes, and permanent closure of permitted hazardous materials and waste storage units.

5.6.3.5 Cumulative Impacts

Facility design and hazardous materials handling programs developed and implemented for the Project will reduce the project's potential impacts to below significance levels. The cumulative projects described in Section 5.1 are largely residential and commercial in nature with little industrial activity included. To the extent that these projects use hazardous materials, they would be required to comply independently with hazardous materials regulations depending on their specific circumstances (e.g., the nature and quantities of hazardous materials stored and used). PHPP construction and operation activities would not be expected to cause or contribute substantially to significant cumulative impacts with respect to hazardous materials handling.

5.6.4 Mitigation Measures

This section describes the mitigation measures that are proposed in order to ensure that PHPP impacts resulting from hazardous materials handling and use are less than significant.

5.6.4.1 Construction Phase

Although the Project is not expected to cause significant adverse environmental impacts from hazardous material handling during construction activities, PHPP proposes the following mitigation measures to minimize the potential for incidents involving hazardous materials during construction.

HM-1 During construction, hazardous materials stored onsite will be limited to small quantities of paint, coatings and adhesive materials, and emergency refueling containers. These materials will be stored in their original containers inside a flammable materials cabinet. Fuels, lubricants, and various other liquids needed for operation of construction equipment will be transported to the construction site on an as-needed basis by equipment service trucks.

HM-2 An onsite safety officer will be designated to implement health and safety guidelines and, if necessary, contact emergency response personnel and local hospitals. MSDS for each onsite chemical will be available and maintained onsite. Employees will be made aware of the chemicals and the location of MSDS sheets.

HM-3. Project construction contractors will be required to develop standard operating procedures for servicing and fueling construction equipment. These procedures will, at a minimum, include the following:

- No smoking, open flames or welding will be allowed in fueling/service areas.
- Servicing and fueling of vehicles and equipment will occur only in designated areas. These areas will be bermed, covered with concrete, or fashioned in some other manner to control potential spills.
- Fueling, service and maintenance will be conducted only by authorized, trained personnel.
- Refueling will be conducted only with approved pumps, hoses, and nozzles.
- All disconnected hoses will be handled in a manner to prevent residual fuel and liquids from being released into the environment.
- Drip pans will be placed under equipment to collect small drips and minimize potential spills during servicing.
- Service trucks will be equipped with fire extinguishers, personal protective equipment, and spill containment equipment, such as absorbents.
- Service trucks will not remain on the job site after fueling and service are complete.
- Spills that occur during vehicle maintenance will be cleaned up immediately and contaminated soil will be containerized and managed in accordance with State and Federal regulations. A log of spills and clean up actions will be maintained.
- Emergency phone numbers will be available onsite.
- All containers used to store hazardous materials will be properly labeled and kept in good condition

5.6.4.2 Operations Phase

Although the Project is not expected to cause significant adverse environmental impacts from hazardous material storage or handling during the operations, PHPP proposes the following mitigation measures to minimize the potential for incidents involving hazardous materials during operations.

HM-4 Concrete spill containment structures will be constructed surrounding each of the bulk chemical storage tanks, including aqueous ammonia, sulfuric acid, sodium hydroxide, sodium hypochlorite, and scale inhibitors. The secondary containment structure surrounding each tank will be designed to contain the tank volume plus additional volume to contain a 25-year, 24-hour rainfall event to account for precipitation. Sumps will be provided within the containment areas in order to facilitate removal of collected rainwater and spilled chemicals.

HM-5 Ammonia tank trucks will be unloaded in a tank truck unloading area paved with concrete and with sump capacity to provide secondary containment for the entire contents of the tank truck plus additional volume to account for precipitation.

HM-6 A fire protection system will be provided to detect, alarm, and suppress a fire, in accordance with the applicable LORS.

HM-7 Construction of the aqueous ammonia storage system will be in accordance with applicable LORS. The aqueous ammonia storage and handling facility will be equipped with the following safety features:

- Carbon steel tank equipped with continuous tank level monitors, temperature gage, and pressure monitor. Safety alarms will also be provided on each monitoring system.
- Pressure relief valves and excess flow control valves on tank and fill connections.

HM-8 A RMP for aqueous ammonia storage and use at the facility will be prepared before the initial filling of the ammonia tank. The RMP will include a hazard analysis, offsite consequence analysis, seismic assessment, emergency response plan, and training procedures. The RMP process will identify and propose adequate mitigation measures to reduce the risk to the lowest possible level.

HM-9 Hazardous materials will be stored and handled in accordance with all Federal, State and local regulations and codes. A safety program will be implemented including safety training programs for contractors and operations personnel. A HMBP will be prepared for submittal to the LA County Fire Department.

HM-10 All areas subject to potential leaks of hazardous materials will be paved and bermed. Incompatible materials will be stored in separate containment areas.

5.6.5 References

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