8.12 Hazardous Materials Handling

8.12.1 Introduction

This subsection evaluates the potential effects on human health and the environment from the storage and use of hazardous materials in conjunction with the Vernon Power Plant (VPP). Subsection 8.12.2 presents the laws, ordinances, regulations, and standards (LORS) applicable to hazardous materials, Subsection 8.12.3 describes the existing environment that may be affected, and Subsection 8.12.4 identifies potential impacts on that environment and on human health from VPP development. Subsection 8.12.5 discusses the offsite migration modeling protocol, Subsection 8.12.6 discusses fire and explosion risk. Subsection 8.12.7 investigates potential cumulative impacts, and Subsection 8.12.8 presents proposed mitigation measures. Subsection 8.12.9 describes the agencies involved and provides agency contacts. Subsection 8.12.10 describes permits required and the permit schedule. Subsection 8.12.11 provides the references used to develop this subsection.

8.12.2 Laws, Ordinances, Regulations, and Standards

The storage and use of hazardous materials, including regulated substances, at VPP are governed by federal, state, and local laws. Applicable laws and regulations address the use and storage of hazardous materials to protect the environment from contamination; they are also intended to protect facility workers and the surrounding community from exposure to hazardous materials. The LORS applicable to VPP are summarized in Table 8.12-1.

TABLE 8.12-1
Applicable Laws, Ordinances, Regulations, and Standards

LORS	Purpose	Applicability (AFC Section Explaining Conformance)
Federal		
29 CFR 1910 et seq. and 1926 et seq.	Requirements for equipment used to store and handle hazardous materials.	Section 8.7, Worker Health and Safety
49 CFR Parts 172, 173, and 179	Provides standards for labeling and packaging of hazardous materials during transportation	Section 8.10, Traffic and Transportation
CERCLA/SARA		
Section 302	Requires certain planning activities when EHSs are present in excess of TPQ. VPP will have ammonia and sulfuric acid in excess of the TPQ.	An HMBP will be prepared to describe planning activities (Subsection 8.12.8.4.2).
Section 304	Requires notification when there is a release of hazardous material in excess of its RQ.	An HMBP will be prepared to describe notification and reporting procedures (Subsection 8.12.8.4.1).
Section 311	Requires MSDS for every hazardous material to be kept onsite and submitted to SERC, LEPC, and the local fire department.	The HMBP to be prepared will include MSDSs and procedures for submission to agencies (Subsection 8.12.8.4.1).

TABLE 8.12-1
Applicable Laws, Ordinances, Regulations, and Standards

LORS	Purpose	Applicability (AFC Section Explaining Conformance)
Section 313	Requires annual reporting of releases of hazardous materials.	The HMBP to be prepared will describe reporting procedures (Subsection 8.12.8.4.1).
CAA	Requires an RMP if listed hazardous materials (designated as "regulated substances") are stored at or above a TQ.	An RMP will not be required under the CAA because VPP will not store regulated substances above federal TQs. However the state's CalARP program requirements will require an RMP for aqueous ammonia because the state's TQ is lower than the federal one. (Subsection 8.12.8.4.2).
CWA	Requires preparation of an SPCC plan if oil is stored above certain quantities.	An SPCC Plan will be prepared (Subsection 8.12.8.4.3).
State		
8 CCR Section 339; Section 3200 et seq., Section 5139 et seq. and Section 5160 et seq.	8 CCR Section 339 lists hazardous chemicals relating to Hazardous Substance Information and Training Act; 8 CCR Section 3200 et seq. and 5139 et seq. address control of hazardous substances; 8 CCR Section 5160 et seq. Addresses hot, flammable, poisonous, corrosive, and irritant substances.	Section 8.7, Worker Health and Safety
Health and Safety Code, Section 25500, et seq.	Requires preparation of an HMBP if hazardous materials are handled or stored in excess of threshold quantities.	An HMBP will be prepared (Subsection 8.12.8.4.1).
CalARP Program. Health and Safety Code, Section 25531 through 25543.4	Requires registration with local CUPA or lead agency and preparation of an RMP if regulated substances are handled or stored in excess of TQs	After registration of regulated substances with the CUPA, i.e., the City's EHD, an RMP will be required for ammonia (Subsection 8.12.8.4.2). VPP will handle and store ammonia above the 500 pound TQ. Sulfuric acid is a regulated substance under the CalARP program only if it meets the definition of oleum or is concentrated and contains greater than 100 pounds of sulfur trioxide or is stored in a container with flammable hydrocarbons. VPP will not use any forms of sulfuric acid regulated under CalARP.
Aboveground Petroleum Storage Act	Requires entities that store petroleum in ASTs in excess of certain quantities to prepare an SPCC Plan.	An SPCC Plan will be prepared (Subsection 8.12.8.4.3).
California Fire Code, Article 80 and others. California Fire Code, Article 80 and others.	Includes provisions for storage and handling of hazardous materials.	Section 8.7, Worker Health and Safety

TABLE 8.12-1
Applicable Laws, Ordinances, Regulations, and Standards

LORS	Purpose	Applicability (AFC Section Explaining Conformance)
Safe Drinking Water and Toxics Enforcement Act (Proposition 65)	Requires warning to persons exposed to a list of carcinogenic and reproductive toxins and protection of drinking water from same toxins.	The site will be appropriately labeled for chemicals on the Proposition 65 list (Subsection 8.12.8.4.4).
Local		
City of Vernon Ordinance No. 961, Hazardous Materials Monitoring.	Requires entities that store or handle hazardous materials to apply for a health permit and submit inventory and business plan information.	An HMBP will be prepared (Subsection 8.12.8.4.1).

AST	Aboveground Storage Tank
CAA	Clean Air Act
CalARP	California Accidental Release Program
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
EHD	Environmental Health Department
EHS	Extremely hazardous substance
HMBP	Hazardous Materials Business Plan
LEPC	Local Emergency Planning Committee
MSDS	Material Safety Data Sheet
RMP	Risk Management Plan
RQ	Reportable Quantity
SARA	Superfund Amendments and Reauthorization Act
SERC	State Emergency Response Commission
SPCC	Spill Prevention Control and Countermeasures
TPQ	Threshold Planning Quantity
TQ	Threshold Quantity
USC	United States Code

8.12.2.1 Federal

Hazardous materials are governed under Title 29 of the USC, Titles 29, 40, and 49 of the CFR, CERCLA, CAA, and CWA.

8.12.2.1.1 29 CFR 1910 et seq. and 1926 et seq.

These sections contain requirements for equipment used to store and handle hazardous materials for the purpose of protecting worker health and safety. This regulation also addresses requirements for equipment necessary to protect workers in emergencies. It is designed primarily to protect worker health, but also contains requirements that affect general facility safety. The California regulations contained in Title 8 (California equivalent of 29 CFR) are generally more stringent than those contained in Title 29. The administering agency for the above authority is the USEPA and Cal OSHA.

8.12.2.1.2 49 CFR Parts 172, 173, and 179

These regulations provide standards for labels, placards, and markings on hazardous materials shipments by truck (Part 172), standards for packaging hazardous materials (Part 173) and for transporting hazardous materials in tank cars (Part 179). The

administering agency for the above authority is the California Highway Patrol and U.S. Department of Transportation.

8.12.2.1.3 CERCLA

The 1986 SARA, an amendment to CERCLA, governs hazardous materials. The applicable part of SARA for VPP is Title III, otherwise known as the Emergency Planning and Community Right-To-Know Act of 1986 (EPCRA). Title III requires states to establish a process for developing local chemical emergency preparedness programs and to receive and disseminate information on hazardous materials present at facilities in local communities. The law provides primarily for planning, reporting, and notification concerning hazardous materials. Key sections of the law are:

- Section 302—Requires that certain emergency planning activities be conducted when EHSs are present in excess of their TPQs. EHSs and their TPQs are found in Appendices A and B of 40 CFR Part 355.
- Section 304—Requires immediate notification to the LEPC and the SERC when a hazardous material is released in excess of its RQ. If a CERCLA-listed hazardous substance RQ is released, notification must also be given to the National Response Center in Washington, D.C. (RQs are listed in 40 CFR Part 302, Table 302.4). These notifications are in addition to notifications given to the local emergency response team or fire personnel.
- Section 311—Requires that either MSDSs for all hazardous materials or a list of all hazardous materials be submitted to the SERC, LEPC, and local fire department.
- Section 313—Requires annual reporting of hazardous materials released into the environment either routinely or as a result of an accident.

The administering agencies for the above authority are the USEPA, Region IX, the National Response Center, and the City's Environmental Health Department (EHD). The EHD is a CUPA.

8.12.2.1.4 Clean Air Act

Regulations (40 CFR 68) under the CAA are designed to prevent accidental releases of hazardous materials. The regulations require facilities that store a TQ or greater of listed regulated substances to develop a RMP, including hazard assessments, prevention programs and response programs to prevent accidental releases of listed chemicals. Section 112(r)(5) of the CAA discusses the regulated substances. These substances are listed in 40 CFR 68.130.

8.12.2.1.5 Clean Water Act

The SPCC program under the CWA is designed to prevent or contain the discharge or threat of discharge of oil into navigable waters or adjoining shorelines. Regulations under the CWA (40 CFR 112) require facilities to prepare a written SPCC Plan if they store oil and its release would pose a threat to navigable waters. The SPCC program is applicable if a facility has a single oil aboveground storage AST with a capacity greater than 660 gallons, total AST storage greater than 1,320 gallons, or underground storage capacity greater than 42,000 gallons.

8.12.2.1.6. Other

Other related federal laws that address hazardous materials but do not specifically address their handling are the Resource Conservation and Recovery Act (RCRA), which is discussed in Subsection 8.13, and the Occupational Safety and Health Act (OSHA), which is discussed in Subsection 8.7.

8.12.2.2 State

California laws and regulations relevant to hazardous materials handling at VPP include Title 8 of the CCR, Health and Safety Code Section 25500 (hazardous materials), Health and Safety Code Section 25531 (regulated substances), and the Aboveground Petroleum Storage Act (petroleum in aboveground tanks).

8.12.2.2.1 8 CCR Section 339; Section 3200 et seq., Section 5139 et seq. and Section 5160 et seq.

8 CCR Section 339 lists hazardous chemicals relating to Hazardous Substance Information and Training Act ; 8 CCR Section 3200 et seq. and 5139 et seq. address control of hazardous substances; 8 CCR Section 5160 et seq. addresses hot, flammable, poisonous, corrosive, and irritant substances. The administering agency for the above authorities is the CEC.

8.12.2.2.2 Health and Safety Code Section 25500

This law is found in the California Health and Safety Code, Section 25500, et seq., and in the regulations contained in 19 CCR Section 2620, et seq. The law requires local governments to regulate business storage of hazardous materials in excess of certain quantities. The law also requires that entities storing hazardous materials be prepared to respond to releases. Those using and storing hazardous materials are required to submit an HMBP to their local administering agency (i.e., CUPA). They must also report releases to their CUPA and the Governor's Office of Emergency Services. The threshold quantities for hazardous materials are 55 gallons for liquids, 500 pounds for solids, and 200 cubic feet for compressed gases measured at standard temperature and pressure.

8.12.2.2.3 Health and Safety Code Section 25531

This law regulates the registration and handling of regulated substances, per California Health and Safety Code, Section 25531, et seq. Regulated substances are any chemicals designated under 40 CFR 68.130 as part of the CAA's Accidental Release Prevention Program or designated by the state of California under its CalARP program. Facilities handling or storing regulated substances at or above threshold quantities (TQs) must register with their local CUPA and, if requested, must prepare an RMP.

8.12.2.2.4 Aboveground Petroleum Storage Act

This law is found in the Health and Safety Code at Sections 25270 to 25270.13 and is intended to ensure compliance with the federal CWA. The law applies if a facility has an AST with a capacity greater than 660 gallons or a combined AST capacity greater than 1,320 gallons and if there is a reasonable possibility that the tank(s) may discharge oil in "harmful quantities" into navigable waters or adjoining shore lands. If a facility falls under these criteria, it must prepare an SPCC Plan. The law does not cover AST design, engineering, construction, or other technical requirements, which are usually determined by local fire departments.

8.12.2.2.5 Safe Drinking Water and Toxics Enforcement Act (Proposition 65)

This law identifies chemicals that cause cancer and reproductive toxicity, informs the public, and prevents discharge of the chemicals into sources of drinking water. Lists of the chemicals of concern are published and updated periodically. The Act is administered by California's Office of Environmental Health Hazard Assessment. Some of the chemicals to be used at VPP are on the cancer-causing lists of the Act.

8.12.2.2.6 California Fire Code, Article 80, and others

The code 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, however, contains 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 presents requirements for combustible and flammable liquids. The administering agency for the above authority is the City's EHD, jointly with the City's Fire Department.

8.12.2.3 Local

Local agencies usually have the responsibility for administering hazardous materials requirements and ensuring compliance with federal and state laws. The City of Vernon's EHD has jurisdiction over hazardous materials storage and handling practices. The local requirements that pertain to hazardous materials are discussed below.

8.12.2.3.1 City of Vernon Ordinance No. 961, Hazardous Materials Monitoring

The ordinance requires entities that store or handle hazardous materials to apply for a health permit. To obtain a permit, a business must submit an inventory of hazardous materials and a contingency plan and training plan.

8.12.2.4 Other Codes

The design, engineering, and construction of hazardous materials storage and dispensing systems will be in accordance with all applicable codes and standards, including the following:

- California Vehicle Code, 13 CCR 1160, et seq.—Provides the CHP with authority to adopt regulations for the transportation of hazardous materials in California.
- State Building Standard Code, Health and Safety Code Sections 18901 to 18949—Incorporates the Uniform Building Code (UBC), Uniform Fire Code, and the Uniform Plumbing Code.
- American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section VIII.
- American National Standards Institute (ANSI) K61.1.
- City of Vernon Municipal Code.

8.12.3 Affected Environment

The project site is located in an industrial area of the City of Vernon in Los Angeles County (Figure 2.1-1). Identification of sensitive receptor facilities (such as schools, day-care facilities, convalescent centers, or hospitals) within 6 miles of the project site was performed by Environmental Data Resources Inc. (EDR). The nearest sensitive receptor is the Pacific Boulevard Special Education Center located approximately 0.5 mile from the site at 5714 Pacific Boulevard in Huntington Park. In addition, Vernon City Elementary, Huntington Park High School, Saint Matthias High School, Holy Angels Church of the Deaf, and First Evangelical Methodist Church of Huntington Park are each located approximately 0.7 mile from the site. A hospital, Community Hospital of Huntington Park, is located approximately 0.6 mile from the site at 2623 E. Slauson Avenue. Good Day Care is located approximately 1.0 mile from the site (EDR, 2006).

Sensitive receptors within a 6-mile radius of the project site are provided in the EDR report in Appendix 8.6A. It also contains a description of the receptors.

8.12.4 Potential Environmental and Human Health Effects

Hazardous materials to be used at VPP during construction and operation were evaluated for hazardous characteristics. That evaluation is discussed in this subsection. Some of these materials will be stored at the generating site continuously. Others will be brought onsite for the initial startup and periodic maintenance (every 3 to 5 years). Some materials will be used only during startup. Hazardous materials will not be stored or used in the gas supply line, water supply line, or electric transmission line corridors during operations. Storage locations are described in Table 8.12-2. Table 8.12-3 presents information about these materials, including trade names; chemical names; Chemical Abstract Service (CAS) numbers; maximum quantities onsite; RQs; TPQs; TQs; and status as a Proposition 65 chemical (a chemical known to be carcinogenic or cause reproductive problems in humans). Toxicity characteristics and the exposure level criteria for regulated substances that will be handled at VPP in quantities exceeding TQs are shown in Table 8.12-4. Health hazards and flammability data are summarized in Table 8.12-5. Table 8.12-5 also contains information on incompatible chemicals (e.g., sodium hypochlorite and ammonia). Measures to mitigate the potential effects from the hazardous materials are presented in Subsection 8.12.8. Due to the size of these tables, Tables 8.12-2 through 8.12-5 are to the end of this section.

8.12.4.1 Construction Phase

During construction of the project and linear facilities, regulated substances, as defined in California's Health and Safety Code, Section 25531, will not be used. Therefore, no discussion of regulated substance storage or handling is included in this subsection.

Hazardous materials to be used during construction of the project and its associated linear facilities will include gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, various lubricants, paint, and paint thinner. There are no feasible alternatives to motor fuels and oils for operating construction equipment. The types of paint required are dictated by the types of equipment and structures that must be coated and by the manufacturers' requirements for coating.

The quantities of hazardous materials that will be onsite during construction are small, relative to the quantities used during operation. Construction personnel will be trained to handle the materials properly. The most likely possible incidents will involve the potential for fuels, oil, and grease dripping from construction equipment. The small quantities of fuel, oil, and grease that might drip from construction equipment will have relatively low toxicity and will be biodegradable. Therefore, the expected environmental impact is minimal.

Small oil spills may also occur during onsite refueling. Equipment refueling will be performed away from water bodies to prevent contamination of water in the event of a fuel spill. Therefore, the potential environmental effects from fueling operations are expected to be limited to small areas of contaminated soil. If a fuel spill occurs on soil, the contaminated soil will be placed into barrels or trucks for offsite disposal as a hazardous waste. The worst-case scenario for a chemical release from fueling operations would be a vehicle accident involving a service or refueling truck. Handling procedures for the hazardous materials to be used onsite during construction are presented in Subsection 8.12.8.1.

The quantities of hazardous materials that will be handled during construction are relatively small and Best Management Practices (BMPs) will be implemented by contractor personnel. Therefore, the potential for environmental effects is expected to be small.

8.12.4.2 Operations Phase

Several hazardous materials, including one regulated substance, will be stored at the generating site during VPP operation. Aqueous ammonia will be stored in amounts above the TQ during the operations phase. An RMP will be prepared consistent with the CalARP program requirements. Many of the hazardous materials that will be stored onsite are corrosive and are a threat to humans (particularly workers at the site) if inhaled, ingested, or contacted with the skin. The hazardous characteristics of materials being used at the site are summarized in Table 8.12-5. Table 8.12-5 also contains information on incompatible chemicals. Mixing incompatible chemicals can generate toxic gases. Measures to keep incompatible chemicals separated include separate storage and containment areas and/or berming (see Subsection 8.12.8).

Potential environmental and/or human health effects could be caused by accidental releases, accidental mixing of incompatible chemicals, fires, and injury to facility personnel from contact with a hazardous material. The accidental release of aqueous ammonia might present the most serious potential for effects on the environment and/or human health.

The VPP facility will store the 19-percent aqueous ammonia solution in one stationary AST. The capacity of the tank will be approximately 20,000 gallons, and the maximum quantity onsite will not exceed 85 percent volume of the tank, or 17,000 gallons. The tank will be surrounded by a secondary containment structure capable of holding the full contents of the tank, plus rainwater accumulated for a 24-hour period from a 25-year storm event. The tank will have a secondary containment area of approximately 1500 square feet (25 feet by 60 feet and 3 feet deep).

Aqueous ammonia will be delivered to the plant by truck transport. The likely supplier would be Hills Brothers Chemical Company located in City of Industry, California. The truck unloading area will be located on an unloading apron adjacent to the storage tank. The use of 19 percent aqueous ammonia will require an average of approximately 1 or

2 deliveries of ammonia per week (no more often than every 5 days). The ammonia unloading area will be a bermed area approximately 20 feet by 45 feet and 2.5 feet deep.

Pure ammonia (NH_3) is a volatile chemical that is stored under pressure as a liquid and becomes a toxic gas if released. The odor threshold of ammonia is about 5 parts per million (ppm), and minor irritation of the nose and throat will occur at 30 to 50 ppm. Concentrations greater than 140 ppm will cause detectable effects on lung function even for short-term exposures (0.5 to 2 hours).

At higher concentrations of 700 to 1,700 ppm, ammonia gas will cause severe effects; death occurs at concentrations of 2,500 to 7,000 ppm. The hazard to facility workers will be mitigated by facility safety equipment, hazardous materials training, and emergency response planning (see Subsection 8.7, Worker Health and Safety). The results of an Offsite Consequences Analysis presented in Subsection 8.12.5, Offsite Migration Modeling, show that a release of a 19 percent solution of aqueous ammonia under a worst-case scenario will not cause significant offsite impacts to public health or safety.

Sulfuric acid, an EHS, is a very corrosive chemical that can cause severe harm to humans if ingested, inhaled, or contacted. However, sulfuric acid has a very low vapor pressure and will not readily volatilize upon release. Therefore, the potential for harm to humans offsite is minimal. Sulfuric acid is identified as a regulated substance under the CalARP program, but only if it is concentrated with greater than 100 pounds of sulfur trioxide, if it meets the definition of oleum, or if it is stored in a container with flammable hydrocarbons. The sulfuric acid that will be used at the VPP facility does not contain more than 100 pounds of sulfur trioxide or meet the definition of oleum. In addition, it will not be stored in a container with flammable hydrocarbons. Therefore, sulfuric acid is not subject to the RMP requirements under CalARP.

The remaining materials in Table 8.12-3 are also considered to be hazardous, but they pose less threat to humans than aqueous ammonia and sulfuric acid. Some materials (citric acid and sodium nitrate) will be used at the site only during initial commissioning and during periodic maintenance (once every 3 to 5 years). Therefore, the potential for environmental or health effects will exist only during those rare occasions when the materials are onsite.

8.12.5 Offsite Consequence Analysis

Because there is human activity in the vicinity of the proposed site, an offsite consequence analysis was performed to assess the risk to humans from the release of aqueous ammonia. Dispersion modeling was conducted using the SLAB numerical dispersion model (LLNL, 1990).

The worst-case accidental release scenario assumed that the aqueous ammonia storage tank was punctured and the entire contents of the tank were released into a secondary containment structure located beneath the tank. An initial ammonia emission rate for an evaporating pool of 19 percent aqueous ammonia solution was calculated pursuant to the guidance given in *RMP Offsite Consequence Analysis Guidance, EPA, April 1999,* and using the "evaporation calculator" provided by the National Oceanic and Atmospheric Administration (NOAA, 2004). An initial ammonia evaporation rate was calculated and assumed to occur for one hour. For concentrated solutions, the initial evaporation rate is substantially higher than the rate averaged over time periods of a few minutes or more since the concentration of the

solution immediately begins to decrease as evaporation begins. However, using the initial evaporation rate results in a worst case ammonia emission rate for the evaporating pool of ammonia. Release rates for ammonia vapor from an evaporating 19-percent solution of aqueous ammonia were calculated assuming mass transfer of ammonia across the liquid surface occurs according to principles of heat transfer by natural convection. The ammonia release rate was calculated using the evaporation calculator, meteorological data listed below and the dimensions of the secondary containment area.

Parameters used to calculate the ammonia emission rates include an atmospheric stability classification of "F," a wind speed of 1.5 meters/second and a temperature of 105 degrees Fahrenheit (°F), which represents the highest temperature recorded over the last 3 years.

Using these parameters, the ammonia plume was predicted—using a height of 1.6 meters—to extend approximately 9.12 meters (29.9 feet) from the ammonia storage tank at a concentration of 200 ppm. At a concentration of 75 ppm, the distance was 9.22 meters (30.2 feet) from the tank (see Table 8.12-6 and Figure 8.12-1). The assumptions used in the ammonia analysis include the following:

- Ammonia emissions are assumed to occur over 1 hour, representing an evaporating pool of 20,000 gallons of a 19 percent ammonia solution
- An ammonia storage temperature of 105°F (highest temperature recorded at the Montebello Station over the past 3 years)
- A diked secondary containment area of 1,500 square feet (25 feet wide by 60 feet long)

TABLE 8.12-6
Gaseous Ammonia Concentrations in the Event of a Release

	Distance from Ammonia Tank and Unloading Area to Plume Edge (meter)			
	0-Meter Receptor Height		1.6-Meter Receptor Height	
Concentration (ppm)	Ammonia Tank	Truck Unloading Area	Ammonia Tank	Truck Unloading Area
2000 ppm (risk of lethality)	8.37	7.53	8.73	8.61
300 ppm (OSHA's IDLH)	8.69	7.93	9.10	9.15
200 ppm (EPA/CalARP toxic endpoint)	8.72	8.03	9.12	9.20
75 ppm (CEC Significance Value)	8.75	8.16	9.22	9.27

Distances calculated at ground level and based on the height of the average human (1.6 m).

Based on this conservative modeling analysis, the worst case accident is not expected to result in an offsite concentration greater than 75 ppm at the southern property boundary, located 225 feet (68.6 meters) from the ammonia tank storage area. Since the general public will not be exposed to ammonia concentrations above 75 ppm during a worst-case release scenario, the storage of aqueous ammonia onsite will not pose a significant risk to the public.

In addition to the worst-case ammonia offsite analysis, an analysis of an unloading release was performed. This analysis assumed the entire contents of the delivery truck was released in the unloading area due to a failure of the delivery system (hose rupture and flow valve failure). The analysis assumed the same meteorological conditions and assumed that 6,500 gallons of ammonia was released into the containment area (20 feet by 45 feet, or 900 square feet). The results of this analysis are similar to the worst-case analysis with the 75 ppm ammonia isopleth extending approximately 9.27 meters (30.4 feet) from the containment area boundary at a height of 1.6 meters, with the southern fence line being approximately 233 feet (71 meters) from the southern edge of the ammonia unloading area (see Figure 8.12-1).

8.12.6 Fire and Explosion Risk

As shown in Table 8.12-5, many of the hazardous materials are non-flammable. Aqueous ammonia, which constitutes the largest quantity of hazardous materials onsite (except for the mineral oil in the transformers), is incombustible in its liquid state. Ammonia evaporating as a gas from a leak or spill of the aqueous solution is combustible within a narrow range of concentrations in air. However, the evaporation rate is sufficiently low that the lower explosive limit (LEL) will not be reached. The lubrication oil and diesel fuel are flammable and will be handled in accordance with a HMBP to be approved by EHD. Hydraulic oil, which is classified as combustible, will also be handled in compliance with the HMBP. With proper storage and handling of flammable materials in accordance with the HMBP, the risk of fire and explosion at the generating facility should be minimal.

The natural gas that will provide VPP with fuel for the combustion turbines is flammable and could leak from the supply line that brings gas from Southern California Gas pipeline 765. The risk of leakage is the normal type of risk encountered with transmitting natural gas via pipeline. Proper design, construction, and maintenance of the line will minimize leaks and the risk of fire or explosion. The line will be buried primarily in or adjacent to roadways.

Oxidizers will be stored onsite that could contribute to a fire or explosion hazard. This includes oxygen in compressed gas cylinders. This material will be segregated from flammables and combustibles during storage.

The closest fire station is located about one mile from the plant at the corner of Fruitland Avenue and Downey Road.

8.12.7 Cumulative Impacts

The primary potential cumulative impact from the use and storage of hazardous materials will be a simultaneous release from two or more sites of a chemical that will migrate offsite. Potentially, the two or more migrating releases could combine; thereby posing a greater threat to the offsite population than a single release by any single site. Hazardous materials that do not migrate, such as sulfuric acid, will not present a potential cumulative impact. The hazardous material with the potential to migrate offsite from VPP is ammonia. To determine the potential for cumulative impacts, other sites in the vicinity that store and use ammonia must be identified and analyzed. In addition, other chemicals in the vicinity with

the ability to migrate offsite that could combine or interact with released ammonia must be identified and analyzed.

Numerous other facilities in the City of Vernon handle and store ammonia. Ammonia is sometimes used for refrigeration, making it a fairly common chemical in an industrial area such as Vernon. The closest facility of record handling ammonia is the Malburg Generating Station (MGS) located at 2715 East 50th Street, in Vernon. This facility is across the street from the VPP and uses aqueous ammonia for emissions control. Simultaneous releases from this facility and the proposed VPP facility could cause cumulative impacts, if the migrating clouds merged. However, based on the results of the Offsite Consequence Analysis, described in Section 8.12.5, an ammonia plume generated during worst-case and unloading release scenarios at the VPP would not migrate offsite. This greatly reduces the chance that a cumulative impact involving the merging of migrating ammonia plumes could occur.

8.12.8 Proposed Mitigation Measures

The following subsections present measures that the Applicant would implement during project construction and operation phases to mitigate risks in handling hazardous materials, particularly the risk of inadvertent spills or leaks that might pose a hazard to human health or the environment.

8.12.8.1 Construction Phase

During facility construction, hazardous materials stored onsite will include small quantities of paints, thinners, solvents, cleaners, sealants, lubricants, and 5-gallon emergency fuel containers. This subsection describes measures that will be taken to mitigate potential risks from hazardous material usage. Paints, thinners, solvents, cleaners, sealants, and lubricants will be stored in a locked utility building. These materials will be handled per the manufacturers' directions and will be replenished as needed. The emergency fuel containers will be Department of Transportation (DOT)-approved, 5-gallon safety containers, secured to the construction equipment. The emergency fuel will be used only when regular vehicle fueling is unavailable.

Fuel, oil, and hydraulic fluids will be transferred directly from a service truck to construction equipment tanks and will not otherwise be stored onsite. Fueling will be performed by designated, trained service personnel either before or at the end of the workday. Service personnel will follow standard operating procedures (SOPs) for filling and servicing construction equipment and vehicles. The SOPs, which are designed to reduce the potential for incidents involving the hazardous materials, include the following:

- Refueling and maintenance of vehicles and equipment will occur in designated areas that are equipped with spill control features (e.g., berms, paved surfaces, spill response kits, etc.).
- Vehicle and equipment service and maintenance will be conducted by authorized personnel only.
- Refueling will be conducted only with approved pumps, hoses, and nozzles.
- Catch-pans will be placed under equipment to catch potential spills during servicing.

- All disconnected hoses will be placed in containers to collect residual fuel from the hose.
- Vehicle engines will be shut down during refueling.
- No smoking, open flames, or welding will be allowed in refueling or service areas.
- Refueling will be performed away from bodies of water to prevent contamination of water in the event of a leak or spill.
- When refueling is completed, the service truck will leave the project site.
- Service trucks will be provided with fire extinguishers and spill containment equipment, such as absorbents.
- Should a spill contaminate soil, the soil will be put in containers for offsite disposal as a hazardous waste.
- All maintenance and refueling areas will be inspected monthly. Results of inspections will be recorded in a logbook that will be maintained onsite.

Small spills will be contained and cleaned up immediately by trained, onsite personnel. Larger spills will be reported via emergency phone numbers to obtain help from offsite containment and cleanup crews. Personnel working on the project during the construction phase will be trained in handling of and the dangers associated with hazardous materials. An onsite health and safety person will be designated to implement health and safety guidelines and contact emergency response personnel and the local hospital, if necessary.

If a spill involves hazardous materials equal to or greater than the specific RQ, all federal, state, and local reporting requirements will be followed. The California Water Code, Section 13272(f), establishes a RQ of 42 gallons for spills of petroleum products in water bodies. In the event of a fire or injury, the local fire department will be called (City of Vernon Fire Station at 3375 Fruitland Avenue in Vernon).

8.12.8.2 Operation Phase

During VPP operation, some hazardous materials will be stored onsite. Listed below are management and mitigation measures for minimizing the risks of hazardous material handling during facility operation.

8.12.8.2.1 Aqueous Ammonia

The aqueous ammonia storage and handling facilities will be equipped with a tank level monitor, temperature and pressure monitors and alarms, and excess flow and emergency block valves. Secondary containment will be provided. If there is an inadvertent release from the storage tank, the liquid will be contained within the secondary containment structure.

8.12.8.2.2 Sulfuric Acid

Sulfuric acid will be fed into the circulating water system in proportion to makeup water flow for alkalinity reduction; this will be done to control the scaling tendency of the circulating water within an acceptable range. The acid feed equipment will consist of an acid storage tank and chemical metering pumps. An 8,000-gallon storage tank will be located near the cooling tower circulating water pumps in a concrete containment area; the area will

have sufficient capacity to contain the full tank contents plus accumulated rainfall for 24 hours during a 25-year storm.

8.12.8.2.3 Other Hazardous Materials

Of the other hazardous materials that are continuously used onsite, one merits additional discussion because of the quantity of material stored. Sodium hypochlorite will be added to the circulating water as a biocide. The system will consist of a 6,000-gallon storage tank, chemical metering pumps, and a leak detection system and alarm system. The tank will be located above a concrete containment area with sufficient capacity to contain the full tank contents plus accumulated rainfall for 24 hours during a 25-year storm.

All hazardous materials will be handled and stored in accordance with applicable codes and regulations. All containers used to store hazardous materials will be inspected regularly for signs of leaking or failure. Incompatible materials will be stored in separate storage and containment areas. Areas susceptible to potential leaks and/or spills will be paved and bermed. Containment areas may drain to a collection area, such as an oil/water separator or a waste collection tank. Piping and tanks will be protected from potential traffic hazards by concrete or pipe-type traffic bollards and barriers.

If a spill involves hazardous materials equal to or greater than the specific RQ all federal, state, and local reporting requirements will be followed. The California Water Code, Section 13272(f), establishes a RQ of 42 gallons for spills of petroleum products in water bodies.

A worker safety plan, in compliance with applicable regulations, will be implemented. It will include training for contractors and operations personnel. Training programs will include safe operating procedures, the operation and maintenance of hazardous materials systems, proper use of personal protective equipment (PPE), fire safety, and emergency communication and response procedures. All plant personnel will be trained in emergency procedures, including plant evacuation and fire prevention. In addition, designated personnel will be trained as members of a plant hazardous material response team; team members will receive the first responder and hazardous material technical training to be developed in the HMBP (Subsection 8.12.8.4). For emergency spills, the City of Vernon Fire Department has thirty-three firefighters trained to a Hazardous Materials Specialist level who have completed formal training in Hazardous Materials Incident Response. Vernon Fire staffs a minimum of a five person Hazardous Materials Response Unit, located at 4301 Santa Fe Avenue. These firefighters are members of an Area E Hazardous Materials (Haz Mat) Response Team. The Haz Mat Team will identify the type and source of the hazardous material, oversee evacuation of people, and confine the spilled material, if possible. Cleanup of the material is the responsibility of the facility causing the spill. The City of Vernon Fire Station No. 1, located at 3375 Fruitland Avenue in Vernon, is the nearest station to the proposed project site. In addition, the City of Vernon Fire Department has mutual-aid agreements with the City of Santa Fe Springs (Area E partner), as well as both the City and County of Los Angeles Fire Departments (Whitworth. 2005)

8.12.8.3 Transportation/Delivery of Hazardous Materials

Hazardous materials will be delivered periodically to VPP. Transportation will comply with the applicable regulations for transporting hazardous materials, including DOT, U.S. Environmental Protection Agency (USEPA), California Department of Toxic Substances

Control (DTSC), CHP, and California State Fire Marshal. Under the California Vehicle Code, the CHP has the authority to adopt regulations for transporting hazardous materials in California. The CHP can issue permits and specify the route for hazardous material delivery. The key hazardous material that will be delivered to VPP is aqueous ammonia, and the Vehicle Code has special regulations for the transportation of hazardous materials that pose an inhalation hazard (Vehicle Code Section 32100.5). These and other regulations concerning any of the other hazardous materials delivered to VPP will be fully satisfied.

8.12.8.4 Hazardous Materials Plans

Hazardous materials handling and storage, and training in the handling of hazardous materials will be set forth in more detail in hazardous materials plans that will be developed by the Applicant.

8.12.8.4.1 Hazardous Materials Business Plan

An HMBP is required by Title 19 CCR and the Health and Safety Code (Section 25504). The plan will include an inventory and location map of hazardous materials onsite and an emergency response plan for hazardous materials incidents. The topics to be covered in the plan are:

- Facility identification
- Emergency contacts
- Inventory information (for every hazardous material)
- MSDSs for every hazardous material
- Site map
- Emergency notification data
- Procedures to control actual or threatened releases
- Emergency response procedures
- Training procedures
- Certification

The HMBP will be filed with the City of Vernon's EHD, the designated CUPA for the project site.

8.12.8.4.2 Risk Management Plan

The requirements for an RMP are found in California's Accidental Release Prevention Program (CalARP) pursuant to Health and Safety Code Sections 25331 through 25543.3 and in CCR Title 19, Section 2735.1 et seq. The California program is similar to the federal RMP program. An RMP is required for regulated substances listed in 19 CCR 2770.5 that exceed designated threshold levels (known as Threshold Quantities or TQs). Under federal regulations, the TQ for aqueous ammonia is 20,000 pounds (for a concentration of 20 percent or greater) and 500 pounds under state regulations regardless of concentration.

The federal TQ will not be triggered by the VPP because a 19 percent concentration of aqueous ammonia will be used. However, because aqueous ammonia will be stored and used at VPP in quantities exceeding the state TQ, an RMP will be required, if requested by the local agency.

If requested, an RMP for aqueous ammonia will be filed with the City's EHD, the designated CUPA for the project site. The RMP will include a hazard assessment to evaluate

the potential effects of accidental releases; a program for preventing accidental releases; and a program for responding to accidental releases to protect human health and the environment.

The basic elements of an RMP are:

- Management System
- Hazard Assessment
- Prevention Program
- Emergency Response

8.12.8.4.3 Spill Prevention Control and Countermeasure Plan

Federal and California regulations require a SPCC Plan if petroleum products above certain quantities are stored in ASTs. Both federal and state laws apply only to petroleum products that might be discharged to navigable waters. If stored quantities are equal to or greater than 660 gallons for a single tank, or equal to or greater than 1,320 gallons total, an SPCC Plan must be prepared. The key elements of an SPCC Plan are:

- Name, location, and telephone number of the facility
- Spill record of the facility and lessons learned
- Analysis of the facility, including:
  - Description of the facilities and engineering calculations
  - Map of the site
  - Storage tanks and containment areas
  - Fuel transfer and storage and facility drainage
  - Prediction and prevention of potential spills
- Spill response procedures
- Agency notification
- Personnel training and spill prevention

VPP will store up to 10,000 gallons of turbine lubrication oil onsite. The nearest waterway is the Los Angeles River, which is approximately 0.7 mile from the project site. An SPCC Plan will be prepared for the project.

8.12.8.4.4 Proposition 65

The facility will use lubricating and turbine oils and diesel fuel. These materials are included in the State of California's Prop 65 list of chemicals known to the state to cause cancer. The site will be appropriately labeled for all chemicals on the Proposition 65 list.

8.12.8.5 Monitoring

An extensive monitoring program will not be required because environmental effects during the construction and operation phases of the facility are expected to be minimal. However, sufficient monitoring will be performed during the construction and operation phases to ensure that the proposed mitigation measures are satisfied and that they are effective in mitigating any potential environmental effects.

8.12.9 Involved Agencies and Agency Contacts

Several agencies regulate hazardous materials, and they will be involved in regulating the hazardous materials stored and used at VPP. At the federal level, the USEPA will be involved; at the state level, the California Environmental Protection Agency (CalEPA) will be involved. However, local agencies primarily enforce hazardous materials laws. For VPP, the primary local agency with jurisdiction will be the City's EHD. The persons to contact are listed in Table 8.12-7.

TABLE 8.12-7
Agency Contacts for VPP Hazardous Materials Handling

Issue	Agency	Address	Person Contacted	Title	Telephone
Certified Unified Permitting Agency (CUPA) for Hazardous Materials Inventory and Emergency Business Plan and RMP	City of Vernon, EHD	4305 Santa Fe Ave. Vernon, CA 90058	Lewis Pozzebon	Director	(323) 583-8811, Ext. 229
Fire Dept. Permits	City of Vernon Fire Department	4305 Santa Fe Ave. Vernon, CA 90058	Mark Whitworth	Fire Chief	(323) 583-8811, Ext. 280
Hazardous Waste Management and Disposal and Emergency Spills	City of Vernon, EHD	4305 Santa Fe Ave. Vernon, CA 90058	Lewis Pozzebon	Director	(323) 583-8811, Ext. 229
Hazardous Materials Response*	City of Vernon, Fire Department	4301 Santa Fe Ave. Vernon, CA 90058	Dan Armellini	Administrative Captain	(323) 583-8811 Ext.-282

* Hazardous Materials Response Team will respond to 911 calls for hazardous materials releases, but the site has to provide spill cleanup team or contractor

8.12.10 Permits Required and Permit Schedule

The City of Vernon requires the following permits and registration listed in Table 8.12-8.

TABLE 8.12-8
Permits Required and Permit Schedule for VPP Hazardous Material Handling

Permit	Schedule	Applicability	Agency Contact
Hazardous Materials Inventory and Emergency Business Plan	30 days prior to start of operations.	Applies to all hazardous materials exceeding reporting thresholds	Lewis Pozzebon City of Vernon Environmental Health Department 4305 Santa Fe Avenue Vernon, CA 90058
California Accidental Release Prevention Program (RMP)	90 days prior to start of operations.	Applies to aqueous ammonia because it will exceed the TQ of 500 pounds	Brett Koontz City of Vernon Environmental Health Department 4305 Santa Fe Avenue Vernon, CA 90058

TABLE 8.12-8
Permits Required and Permit Schedule for VPP Hazardous Material Handling

Permit	Schedule	Applicability	Agency Contact
Class II, Class III-A, and Class III-B Liquids Storage Permit	Prior to storage of greater than 25 gallons inside or 55 gallons outside of these materials at the site	Requires that businesses obtain permits for combustible materials storage	Bill Wilson City of Vernon Community Services Dept 4305 Santa Fe Avenue Vernon, CA 90058

8.12.11 References

EDR. 2006. EDR Offsite Receptor Report. January 20, 2006.

LLNL. 1990. User's Manual for SLAB: An Atmospheric Dispersion Model for Denser-than-Air Releases. Lawrence Livermore National Laboratory. June.

Lewis, R.J. Sr. 1991. *Hazardous Chemical Desk Reference*, 2nd Edition.

NOAA. 2004. Evaporation Calculator. http://archive.orr.noaa.gov/cameo/evapcalc/evap.html

U.S. Department of Health and Human Services, Public Health Service Centers for Disease Control. National Institute for Occupational Safety and Health. 1990. NIOSH Pocket Guide to Chemical Hazards.

U.S. Environmental Protection Agency (USEPA). 2005. Envirofacts Data Warehouse and Applications. URL: http://oaspub.epa.gov/enviro.

U.S. Environmental Protection Agency (USEPA), 1999. RMP Offsite Consequence Analysis Guidance. April.

TABLE 8.12-2
Use and Location of Hazardous Materials

Chemical	Use	Storage Location	State	Type of Storage
Algaecide (Bellacide 329)	Cooling tower biological control, used periodically	Cooling tower chemical feed area	Liquid	Continuously Onsite
Aqueous Ammonia (19% NH_3)	Control oxides of nitrogen (NOx) emissions through selective catalytic reduction	Outside, east of admin. Building	Liquid	Continuously Onsite
	Maintain HRSG chemistry	At condenser area	Liquid	Continuously Onsite
Anti-Foam (e.g., Pluronic L61)	Cooling tower to control foaming	Water treatment building	Liquid	Continuously Onsite
Antifreeze	Closed loop cooling systems	Water treatment building	Liquid	Continuously Onsite
Borax	Buffer for closed loop cooling systems	Water treatment building	Solid Crystals	Continuously Onsite
Citric Acid	Cleaning reverse osmosis and EDI units	Water treatment building	Liquid	Intermittent use
Cleaning chemicals/detergents	Periodic cleaning of HRSG and combustion turbine	Water treatment building and maintenance shop	Liquid	Continuously Onsite
Diesel No. 2	Fuel for fire pump engine/vehicles	Near fire pump	Liquid	Continuously Onsite
General Dispersant	Closed Cooling System deposit control	Closed Cooling System chemical storage area	Liquid	Continuously Onsite
Hydraulic Oil	High-pressure combustion turbine starting system, turbine control valve actuators	Contained within equipment	Liquid	Continuously Onsite
Hydrochloric Acid	Reverse osmosis cleaning	Water treatment building	Liquid	Continuously Onsite
Laboratory reagents	Water/wastewater laboratory analysis	Cycle chemical feed building	Liquid and Granular Solid	Continuously Onsite
Lubrication Oil	Lubricate rotating equipment (e.g., gas turbine and steam turbine bearings)	Contained within equipment	Liquid	Continuously Onsite
Mineral Insulating Oil	Transformers/switchyard	Contained within transformers -	Liquid	Continuously Onsite
Non-Oxidizing Biocide (Gluteraldehyde)	Closed cooling system biological control, used periodically	Closed Cooling System chemical storage area	Liquid	Continuously Onsite
Oxygen	Water chemistry	Outside, near each HRSG	Gas	Continuously Onsite
		Added at boiler feed pumps		

TABLE 8.12-2
Use and Location of Hazardous Materials

Chemical	Use	Storage Location	State	Type of Storage
Oxygen Scavenger (NALCO ELIMIN-OX)	Oxygen scavenger for boiler cleaning solution and steam-water cycle	Containers near condensate polisher area	Liquid	Used for initial boiler cleaning and upsets to HRSG chemistry
Permatreat PC-191	Scale inhibitor for reverse osmosis	Water treatment building	Liquid	Continuously Onsite
Polyaluminum Chloride	Coagulant for water treatment	Water treatment building	Liquid	Continuously Onsite
PQ Solution N	Closed Cooling System carbon steel corrosion control	Closed Cooling System chemical storage area	Liquid	Continuously Onsite
Scale Inhibitor (Belclene 200)	Cooling tower calcite scale inhibitor	Cooling tower chemical feed area	Liquid	Continuously Onsite
Scale Inhibitor (Belclene 400)	Cooling tower dispersant	Cooling tower chemical feed area	Liquid	Continuously Onsite
Scale Inhibitor (Acumer 2000)	Cooling tower calcium phosphate scale inhibitor	Cooling tower chemical feed area	Liquid	Continuously Onsite
Sodium Bromide	Cooling tower biocide supplement	Cooling tower chemical feed area	Liquid	Continuously Onsite
Sodium Hydroxide (50%)	Cleaning of reverse osmosis units	Water treatment building	Liquid	Intermittent
Sodium Hypochlorite (NaOHCl) (12.5 %)	Oxidizing biocide for circulating water system and process water pretreatment	Cooling tower chemical feed area and water treatment building	Liquid	Continuously Onsite
Sodium Nitrate	Cleaning of HRSG, initial startup and once every 3 to 5 years	Outside, near each HRSG	Solid Crystals	Initial Startup and Periodically Onsite
Sulfur Hexafluoride	Switchyard/switchgear devices	Contained within equipment	Gas	Continuously Onsite
Sulfuric Acid (H_2SO_4)	Circulating water pH control	Outside, near cooling tower chemical feed area	Liquid	Continuously Onsite
Trisodium Phosphate (Na_3PO_4)	Boiler water alkalinity control	Cycle chemical feed building	Liquid	Continuously Onsite

TABLE 8.12-3
Vernon Power Plant Chemical Inventory

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	EHS TPQ[c]	Regulated Substance TQ[f]	Prop 65
Algaecide (Bellacide 329)	Terbuthylazine (2-(tert-butylamino)-4-6-(ethylamino)-5-triazine	5915-41-3	400 gal.	[d]	[d]	[d]	[d]	No
Anti-Foam (Pluronic L61)	Block Copolymer Surfactant	9003-11-6	55 gal.	[d]	[d]	[d]	[d]	No
Antifreeze	Propylene Glycol	57-55-6	55 gal.	[d]	[d]	[d]	[d]	No
Aqueous Ammonia	Aqueous Ammonia (19%)	7664-41-7 (NH_3)	20,000 gal.	100 lb.	100 lb.	500 lb.	500 lb. (state)	No
Borax	Sodium tetraborate decahydrate ($Na_2B_4O_7.10H_20$)	1303-96-4	500 lb.	[d]	[d]	[d]	[d]	No
Chelating Agents	Ethylenediaminetetra-acetic acid (EDTA)	60-00-4	55 gal.	5,000 lb.	5,000 lb.	[d]	[d]	No
Citric Acid	Citric Acid	77-92-9	100 lb.	[d]	[d]	[d]	[d]	No
Cleaning Chemicals/Detergents	Various	None	100 gal.	[d]	[d]	[d]	[d]	No
Diesel No. 2	Oil	None	400 gal.	42 gal.[e]	42 gal.[e]	[d]	[d]	Yes
General Dispersant	Cyanamer P-70	25987-30-8	55 gal.	[d]	[d]	[d]	[d]	Yes
Hydraulic Oil	Oil	None	500 gal.	42 gal.[e]	42 gal.[e]	[d]	[d]	No
Hydrochloric Acid (reverse osmosis cleaning)	Hydrochloric Acid (30%)	7647-01-0	110 gal.	5,000 lb.	16,667 lb.	500 lb.	[d]	No
Laboratory Reagents (liquid)	Various	None	10 gal.	[d]	[d]	[d]	[d]	No
Laboratory Reagents (solid)	Various	None	100 lb.	[d]	[d]	[d]	[d]	No
Lubrication Oil	Oil	None	10,000 gal.	42 gal.[e]	42 gal.[e]	[d]	[d]	Yes
Mineral Insulating Oil	Oil	8012-95-1	47,000 gal.	42 gal.[e]	42 gal.[e]	[d]	[d]	Yes

TABLE 8.12-3
Vernon Power Plant Chemical Inventory

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	EHS TPQ[c]	Regulated Substance TQ[f]	Prop 65
Non-Oxidizing Biocide	Gluteraldehyde	111-30-8	220 gal.	[d]	[d]	[d]	[d]	No
Oxygen	Oxygen	7782-44-7	600 cubic feet	[d]	[d]	[d]	[d]	No
Oxygen Scavenger (NALCO ELIMIN-OX)	Carbohydrazide	497-18-7	800 gallons	[d]	[d]	[d]	[d]	No
Permatreat PC-191	Proprietary Mixture of Phosphonates	Proprietary	400 gal.	[d]	[d]	[d]	[d]	No
Polyaluminum Chloride	Polyaluminum Chloride	39290-78-3	600 gal.	[d]	[d]	[d]	[d]	No
PQ Solution N	Polysilicate	1344-09-8 7732-18-5	55 gal.	[d]	[d]	[d]	[d]	No
Scale Inhibitor Belclene 200	Polymaleic Acid	26099-09-2	3,300 gal.	[d]	[d]	[d]	[d]	No
Scale Inhibitor Belclene 400	Acrylic Acid, Telomer with Sodium 2-Acrylamido-2-Methyl-1-Propanesulfonate and Sodium Phosphinate	110224-99-2	3,300 gal.	[d]	[d]	[d]	[d]	No
Scale Inhibitor Acumer 2000	Acrylic Polymer	9011-14-7	1,000 gal.	[d]	[d]	[d]	[d]	No
Sodium Hydroxide (50% solution)	Sodium Hydroxide 50%	1310-73-2	500 gal.	1,000 lb.	2,000 lb.		[d]	No
Sodium Hypochlorite (Bleach)	Sodium Hypochlorite (12.5%)	7681-52-9	6,000 gal.	100 lb.	1,000 lb.	[d]	[d]	No
Sodium Nitrate	Sodium Nitrate	7631-99-4	500 lb. initially and once every 3 to 5 years	[d]	[d]	[d]	[d]	No
Sulfur Hexafluoride	Sulfur Hexafluoride	2551-62-4	200 lb.	[d]	[d]	[d]	[d]	No
Sulfuric Acid	Sulfuric Acid (93%)	7664-93-9	8,000 gal. (118,000 lbs)	1,000 lb.	1,075 lb.	1,000 lb.	[d,g]	No

TABLE 8.12-3
Vernon Power Plant Chemical Inventory

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	EHS TPQ[c]	Regulated Substance TQ[f]	Prop 65
Trisodium Phosphate	Sodium Phosphate, Tribasic	7601-54-9	400 gal.	5,000 lb.	5,000 lb.	[d]	[d]	No

[a] RQ for a pure chemical, per the CERCLA [Ref. 40 CFR 302, Table 302.4]. Release equal to or greater than RQ must be reported. Under California law, any amount that has a realistic potential to adversely affect the environment or human health or safety must be reported.

[b] RQ for materials as used onsite. Since some of the hazardous materials are mixtures that contain only a percentage of a reportable chemical, the RQ of the mixture can be different than for a pure chemical. For example, if a material only contains 10% of a reportable chemical and the RQ is 100 lb., the RQ for that material would be (100 lb.)/(10%) = 1,000 lb.

[c] TPQ [Ref. 40 CFR Part 355, Appendix A]. If quantities of extremely hazardous materials equal to or greater than TPQ are handled or stored, they must be registered with the local Administering Agency.

[d] No reporting requirement. Chemical has no listed threshold under this requirement.

[e] State RQ for oil spills that will reach California state waters [Ref. CA Water Code Section 13272(f)].

[f] TQ is from 19 CCR 2770.5 (state) or 40 CFR 68.130 (federal).

[g] There is a state TQ of 1,000 lb. for sulfuric acid that does not apply to this form of sulfuric acid.

TABLE 8.12-4
Toxic Effects and Exposure Levels of Regulated Substances Exceeding TQs

Name	Toxic Effects	Exposure Levels
Aqueous Ammonia (19% solution)	Toxic effects for contact with pure liquid or vapor causes eye, nose, and throat irritation, skin burns, and vesiculation. Ingestion or inhalation causes burning pain in mouth, throat, stomach, and thorax, constriction of thorax, and coughing followed by vomiting blood, breathing difficulties, convulsions, and shock. Other symptoms include dyspnea, bronchospasms, pulmonary edema, and pink frothy sputum. Contact or inhalation overexposure can cause burns of the skin and mucous membranes, and headache, salivation, nausea, and vomiting. Other symptoms include labored breathing, bloody mucous discharge, bronchitis, laryngitis, hemmoptysis, and pneumonitis. Damage to eyes may be permanent, including ulceration of conjunctiva and cornea and corneal and lenticular opacities.	Occupational Exposures PEL = 35 mg/m3 OSHA TLV = 18 mg/m3 ACGIH TWA = 25 mg/m^3 NIOSH STEL = 35 mg/m3 Hazardous Concentrations IDLH = 500 ppm LD_{50} = 350 mg/kg - oral, rat ingestion of 3 to 4 ml may be fatal Sensitive Receptors ERPG-1 = 25 ppm ERPG-2 = 200 ppm ERPG-3 = 1,000 ppm

ACGIH	American Conference of Government Industrial Hygienists
ERPG	Emergency Response Planning Guideline
ERPG-1	Maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing other than mild transient adverse health effects
ERPG-2	Maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without developing irreversible or serious health effects
ERPG-3	Maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing life-threatening health effects
IDLH	Immediately dangerous to life and health
LD_{50}	Dose lethal to 50 percent of those tested
LDLO	Lowest published lethal dose
mg/kg	Milligrams per kilogram
mg/m^3	Milligrams per cubic meter
NIOSH	National Institute of Occupational Safety and Health
PEL	OSHA permissible exposure limit for 8-hr workday
REL	Reference Exposure Level
ppm	parts per million
STEL	Short-term exposure limit, 15-min. exposure
TCLO	Lowest published toxic concentration
TLV	ACGIH threshold limit value for 8-hr workday
TWA	NIOSH time-weighted average for 8-hr workday

TABLE 8.12-5
Toxicity of Hazardous Materials

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability*
Algaecide (Bellacide 329)	Off-white suspension			
Aqueous Ammonia	Colorless liquid with pungent odor	*Corrosive*: Irritation to permanent damage from inhalation, ingestion, and skin contact.	Acids, halogens (e.g., chlorine), strong oxidizers, salts of silver and zinc.	Liquid is incombustible; Vapor is combustible, but difficult to burn
Ammonium Bifluoride	White crystals	*Corrosive, Toxic*: Caustic poison and strong irritant.	None.	Non-flammable
Anti-Foam (Pluronic L61)	Clear to slightly cloudy liquid with mild polyol odor	Causes irritation to skin and eyes	None known.	Non-flammable
Antifreeze	Colorless, odorless viscous liquid	Causes irritation	Strong oxidizing agents	Combustible
Borax	Off-white granules, odorless	May be harmful if ingested; respiratory and eye irritant	None.	Non-flammable
Chelating Agent (EDTA)	White powder, odorless	Dust may be irritating to eyes and mucous membranes	None.	Non-flammable
Citric Acid	Translucent crystals	None.	None.	Non-flammable
Cleaning Chemicals/Detergents	Liquid	Refer to individual chemical labels.	Refer to individual chemical labels.	Refer to individual chemical labels
Diesel No. 2	Oily, light liquid	May be carcinogenic.	Sodium hypochlorite. Oxidizers.	Flammable
General Dispersant (Cyanamer P-70)	Straw-colored liquid with ammonia odor	May irritate eyes and skin	Strong acids and oxidizing agents	Non-flammable
Hydraulic Oil	Oily, dark liquid	Hazardous if ingested.	Sodium hypochlorite. Oxidizers	Combustible
Hydrochloric Acid	Colorless, pungent, fuming liquid	*Strongly Corrosive and Toxic*: Toxic by ingestion. Strong irritant to eyes and skin.	Metals, hydroxides, amines, alkalis.	Non-flammable
Laboratory Reagents	Liquid and solid	Refer to individual chemical labels.	Refer to individual chemical labels.	Refer to individual chemical labels
Lubrication Oil	Oily, dark liquid	Hazardous if ingested.	Sodium hypochlorite. Oxidizers	Flammable

TABLE 8.12-5
Toxicity of Hazardous Materials

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability*
Mineral Insulating Oil	Oily, clear liquid	Minor health hazard.	Sodium hypochlorite. Oxidizers	Can be combustible, depending on manufacturer
Non-Oxidizing Biocide (Gluteraldehyde)	Clear liquid, colorless to slightly yellow	*Irritant.* May cause tissue burns if ingested, respiratory tract irritation if inhaled. Eye and skin irritation.	Acids, alkalies	Non-flammable
Oxygen	Colorless, odorless, tasteless gas	Therapeutic overdoses can cause convulsions. Liquid oxygen is an irritant to skin.	Hydrocarbons, organic materials	Oxidizing agent; actively supports combustion
Oxygen Scavenger (NALCO ELIMIN-OX)	Colorless liquid	*Toxic*: Slightly toxic, low human hazard	Mineral acids, nitrites, and strong oxidizers	Non-flammable
Permatreat PC-191	Mix of phosphonates			
Polyaluminum Chloride	Clear amber to colorless liquid, slight odor	*Corrosive:* Irritant to skin, eyes and mucous membranes. Can generate Hydrogen Chloride mist or release HCl gas in a fire.	Ammonia, sodium hydroxide, potassium hydroxide, chlorites, carbonates, metals (zinc and aluminum), Strong alkalies, Heat.	Non-flammable
PQ Solution N	Clear, colorless, viscous liquid. Odorless.	*Corrosive:* To skin, eyes, and mucous membranes. Toxic if ingested.	May react with certain metals on prolonged contact to form flammable hydrogen gas.	Non-flammable
Scale Inhibitor (Belclene 200)	Clear amber liquid, slight odor	*Corrosive*	Long chain nitrogen compounds, aliphatic amine and quaternary ammonium compounds	Non-flammable
Scale Inhibitor (Belclene 400)	Clear to slightly turbid yellow liquid, slight odor	*Corrosive*	Long chain nitrogen compounds, aliphatic amine and quaternary ammonium compounds	Non-flammable
Scale Inhibitor (Acumer 2000)	Clear liquid, mild odor	May irritate eyes and skin. Inhalation of vapor or mist may cause headache, nausea, and irritation of nose, throat, and lungs.	None known	Non-flammable
Sodium Hydroxide (50%)	Clear yellow liquid	*Corrosive:* Irritant to tissue in presence of moisture; strong irritant to tissue by ingestion	Water, acids, organic halogens, some metals	Non-flammable

TABLE 8.12-5
Toxicity of Hazardous Materials

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability*
Sodium Hypochlorite (Bleach) (12.5%)	Pale green; sweet, disagreeable odor. Usually in solution with H_2O or sodium hydroxide.	*Corrosive and Toxic*: Toxic by ingestion. Strong irritant to tissue.	Ammonia and organic materials.	Fire risk when in contact with organic materials
Sodium Nitrate	Colorless Crystals	*Toxic*: Mildly toxic by ingestion.	Acetic Anhydride, Aluminum Powder, Antimony Powder, Barium Thiocyanate, Cyanides, Bitumen, Boron Phosphide, Magnesium, Metal Amidosulfates, Organic Matter, Perosyformic Acid, Sodium Hypophosphite, Wood.	Non-flammable
Sulfur Hexafluoride	Colorless gas with no odor.	Hazardous if inhaled.	Disilane.	Non-flammable
Sulfuric Acid	Colorless, dense, oily liquid.	*Strongly Corrosive*: Strong irritant to all tissue. Minor burns to permanent damage to tissue.	Organic materials, chlorates, carbides, fulminates, metals in powdered form. Reacts violently with water.	Non-flammable
Trisodium Phosphate	Colorless crystals.	*Corrosive and Toxic*: Toxic by ingestion. Irritant to tissue.	None.	Non-flammable

Data were obtained from MSDSs and Lewis (1991).

* Per Department of Transportation regulations, under 49 CFR 173: “Flammable” liquids have a flash point less than or equal to 141°F; “Combustible” liquids have a flash point greater than 141°F.

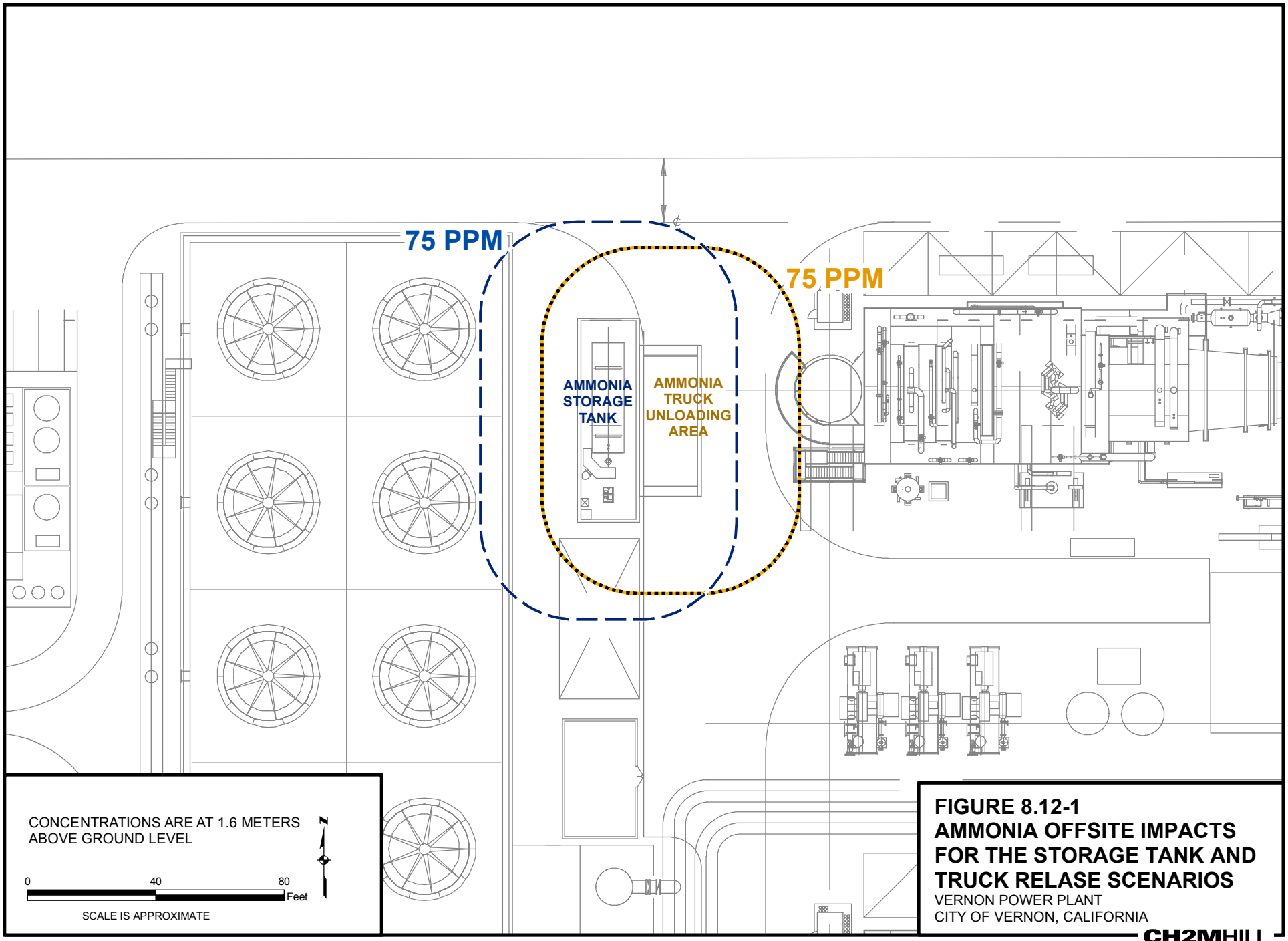

FIGURE 8.12-1
AMMONIA OFFSITE IMPACTS FOR THE STORAGE TANK AND TRUCK RELASE SCENARIOS
VERNON POWER PLANT
CITY OF VERNON, CALIFORNIA

CH2MHILL

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