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8.12 Hazardous Materials Handling

8.12.1 Introduction

This section evaluates the potential effects on human health and the environment from the storage and use of hazardous materials in conjunction with CPP.

Section 8.12.2 presents the LORS applicable to hazardous materials. Section 8.12.3 describes the existing environment that may be affected, and Section 8.12.4 identifies potential impacts on that environment and on human health from CPP development. Section 8.12.5 discusses the off-site migration modeling protocol. Section 8.12.6 discusses fire and explosion risk. Section 8.12.7 investigates potential cumulative impacts and Section 8.12.8 presents proposed mitigation measures, and Section 8.12.9 describes the agencies involved and provides agency contacts. Section 8.12.10 describes permits required and the permit schedule. Section 8.12.11 provides the references used to develop this section.

8.12.2 Laws, Ordinances, Regulations, and Standards

The storage and use of hazardous materials and acutely hazardous materials at CPP 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 and facility workers and the surrounding community from exposure to hazardous and acutely hazardous materials. The applicable LORS are summarized in Table 8.12-1.

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

LORS	Applicability	AFC Conformance Section
Federal:		
CERCLA/SARA		
Section 302	Requires certain planning activities when EHS are present in excess of TPQ. CPP will have ammonia, cyclohexylanine, and sulfuric acid in excess of the TPQ.	An RMP will be prepared to describe planning activities. (Section 8.12.8.4)
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. (Section 8.12.8.4)
Section 311	Requires MSDS for every hazardous material to be kept on-site and submitted to SERC, LEPC, and the local fire department.	The HMBP to be prepared will include MSDSs and procedures for submission to agencies. (Section 8.12.8.4)
Section 313	Requires annual reporting of releases of hazardous materials.	The HMBP to be prepared will describe reporting procedures. (Section 8.12.8.4)
CAA	Requires an RMP if listed hazardous materials are stored at or above a TQ.	An RMP will be prepared. (Section 8.12.8.4)
CWA	Requires preparation of an SPCC plan if oil is stored above certain quantities.	An SPCC will be prepared. (Section 8.12.8.4)

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

LORS	Applicability	AFC Conformance Section
California:		
Health and Safety Code, Section 25500, et seq. (Waters Bill)	Requires preparation of an HMBP if hazardous materials are handled or stored in excess of threshold quantities.	An HMBP will be prepared. (Section 8.12.8.4)
California Fire Code (Title 24, CCR, Part 9)	Requires proper storage and handling of hazardous materials and preparation of an HMMP.	An HMMP will be prepared. (Section 8.12.8.4)
CalARP Program. Health and Safety Code, Section 25531 through 25543.4 (La Follette Bill)	Requires registration with local CUPA or lead agency and preparation of an RMP if acutely hazardous materials are handled or stored in excess of TPQs.	An RMP will be prepared that will describe procedures for registration with Sacramento County CUPA. (Section 8.12.8.4)
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. (Section 8.12.8.4)
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. (Section 8.12.2.2.4)
Local:		
Sacramento Fire Code	Requires proper storage and handling of hazardous materials.	Proper HAZMAT storage and handling procedures will be implemented. (Section 8.12.8)

AST	Aboveground Storage Tank
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
EHS	Extremely hazardous substance
HMBP	Hazardous Materials Business Plan
HMMP	Hazardous Materials Management Plan
LEPC	Local Emergency Planning Committee
MSDS	Material Safety Data Sheet
RMP	Risk Management Plan
RQ	Reportable Quantity
SAR	Superfund Amendments and Reauthorization Act
SERC	State Emergency Response Commission
SPCC	Spill Prevention, Control, and Countermeasures
TPQ	Threshold Planning Quantities
TQ	Threshold Quantity

8.12.2.1 Federal

Hazardous materials are governed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Clean Air Act (CAA), and the Clean Water Act (CWA).

8.12.2.1.1 CERCLA

The Superfund Amendments and Reauthorization Act (SARA), an amendment to CERCLA, governs hazardous materials. The applicable part of SARA for CPP 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 Extremely Hazardous Substances (EHSs) are present in excess of their Threshold Planning Quantities (TPQs). EHSs and their TPQs are found in Appendices A and B to 40 CFR Part 355.
- Section 304—Requires immediate notification to the Local Emergency Planning Committee (LEPC) and the State Emergency Response Commission (SERC) when a hazardous material is released in excess of its Reportable Quantity (RQ). If a CERCLA-listed hazardous substance is released exceeding its RQ, 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 Material Safety Data Sheets (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.

8.12.2.1.2 CAA

Regulations (40 CFR 68) under the CAA are designed to prevent accidental releases of hazardous materials. The regulations require facilities that store a Threshold Quantity (TQ) or greater of listed hazardous materials to develop a Risk Management Plan (RMP), including hazard assessments and response programs to prevent accidental releases of certain chemicals. Section 112(r)(5) of the CAA discusses the regulated chemicals. These chemicals are listed in 40 CFR 68.130. Aqueous ammonia is a listed substance, and its TQ for solutions of 20 percent and greater is 20,000 pounds of solution.

8.12.2.1.3 CWA

The Spill Prevention, Control, and Countermeasures (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 (40 CFR 112) under the CWA 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 tank (AST) with a capacity greater than 660 gallons, total aboveground tank storage greater than 1,320 gallons, or underground storage capacity greater than 42,000 gallons.

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 Section 8.13, and the Occupational Safety and Health Act (OSHA), which is discussed in Section 8.7.

8.12.2.2 State

California laws and regulations relevant to hazardous materials handling at CPP include Health and Safety Code Section 25500 et seq. (hazardous materials), Health and Safety Code Section 25531 (acutely hazardous materials), and the Aboveground Petroleum Storage Act (petroleum in aboveground tanks).

8.12.2.2.1 Health and Safety Code Section 25500 (Waters Bill)

This law is found in the California Health and Safety Code, Section 25500, et seq., and in the regulations to the law in 19 CCR Section 2620, et seq. The law requires local governments to regulate local 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 (AA) and to report releases to their AA 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.

8.12.2.2.2 Health and Safety Code Section 25531 (La Follette Bill)

Found in the California Health and Safety Code, Section 25531, et seq., the law regulates the registration and handling of acutely hazardous materials. Acutely hazardous materials are any chemicals designated as extremely hazardous substances by the USEPA as part of its implementation of SARA Title III. Health and Safety Code Section 25531 expands the programs mandated by the Waters Bill and overlaps or duplicates some of the requirements of SARA and the CAA. Facilities handling or storing acutely hazardous materials at or above TPQs must register with their local AA and prepare an RMP, formerly known as a Risk Management and Prevention Program (RMPP). The RMP program, also known as the Accidental Release Prevention (ARP) program, is regulated under Title 19, CCR, Chapter 4.5. The TPQ for aqueous ammonia is 500 pounds.

8.12.2.2.3 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 aboveground storage tank (AST) with a capacity greater than 660 gallons or 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. The law does not cover AST design, engineering, construction, or other technical requirements, which are usually determined by local fire departments.

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

This law identifies chemicals that cause cancer and reproductive toxicity, informs the public of exposure, 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 CPP are on the cancer-causing and reproductive-toxicity lists of the Act.

8.12.2.2.4 California Fire Code

This code contains fire-safety-related building standards, based on the Uniform Fire Code. It was adopted as Part 9 of the California Building Standards Code in 1995 (Title 24, CCR). Local fire districts are allowed to adopt amendments to the California Fire Code to establish their own standards, but they must be at least as stringent as the state standards.

8.12.2.3 Local

Local AAs usually have the responsibility for administering hazardous materials requirements and ensuring compliance with federal and state laws. The site is located in Sacramento County.

8.12.2.3.1 Sacramento County

The ordinances regulating hazardous materials in the county are Chapters 6.96 and 6.99 of the Sacramento County Code (SCC). The Sacramento County Environmental Management Department (EMD) is the designated Certified Unified Program Agency (CUPA) and is responsible for administering HMBPs/HMMPs, SPCC Plans, and RMPs filed by businesses located in the county. The County is also responsible under the CUPA program for underground storage tank compliance. In addition, the County's EMD is the regulatory body for all hazardous waste generated in the County (see Section 8.13, Waste Management). The County EMD is responsible for ensuring that businesses and industry store and use hazardous materials safely and in conformance with various regulatory codes. EMD performs inspections at established facilities to verify that hazardous materials are properly stored and handled and that the types and quantities of materials reported in a company's Hazardous Materials Business Plan are accurate.

8.12.2.3.2 City of Sacramento

The proposed project site is located outside the city limits for the City of Sacramento, although portions of the gas pipeline are within the City of Sacramento. The City of Sacramento's Fire Department has a Hazardous Materials Response Team that is contracted by Sacramento County to respond to hazardous materials incidents throughout the County. The City has a Hazardous Materials Emergency Response Plan that was updated in 1997. This plan is administered by the City of Sacramento Fire Department.

8.12.2.4 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 California Highway Patrol (CHP) with authority to adopt regulations for the transportation of hazardous materials in California.
- The Uniform Fire Code, Article 80—The hazardous materials section of the Fire Code. Local fire agencies or departments enforce this code and can require that an HMBP and a Hazardous Materials Inventory Statement be prepared. This requirement and the Waters Bill requirement for an HMBP can usually be satisfied in a single combined document.

- State Building Standard Code, Health and Safety Code Sections 18901 to 18949—Incorporates the UBC, Uniform Fire Code, and Uniform Plumbing Code.
- The American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section VIII.
- The American National Standards Institute (ANSI) K61.1.

8.12.3 Affected Environment

The project site is located in Sacramento County on Clay East Road, approximately 1.75 miles east of the intersection between Twin Cities and Clay East Road, and approximately 25 miles southeast of Sacramento (Figure 1.1-1). The site is located in the southwest corner of the Rancho Seco property. Land use in the surrounding area is discussed in detail in Sections 8.4 and 8.9. There are no sensitive receptor facilities (such as schools, daycare facilities, convalescent centers, or hospitals) in the vicinity (i.e., within a 3-mile radius) of the project site.

Hazardous and acutely hazardous materials will be stored at the project site during CPP operation. Storage locations are described in Table 8.12-2.

TABLE 8.12-2
Location of Hazardous Materials

Chemical	Use	Storage Location
Aqueous Ammonia (29% NH_3 + 71% H_2O)	Selective catalytic reduction	Northeastern area of the site, just north of the raw water storage tanks and pumps
Sodium Hydroxide (NaOH) (e.g., Nalco 7383)	pH neutralization (if required)	Near cooling tower circulating water pumps
Sulfuric Acid (H_2SO_4)	Cooling tower alkalinity control (if required)	Near cooling tower circulating water pumps
Disodium Phosphate (Na_2HPO_4)	HRSG drum solids control	Water treatment building/laboratory
Trisodium Phosphate (Na_3PO_4)	HRSG drum solids control	Water treatment building/laboratory
Sodium Hypochlorite (NaOCL) (i.e., bleach)	Cooling tower biological control	Cooling tower chemical feed system
Sodium Tolytriazole (e.g., Nalco 8306 Plus)	Anitscalant for use in cooling tower	Cooling tower chemical feed system
Stabrex ST70	Biocide in cooling tower	Cooling tower chemical feed system
NALCO 356 or NALCO TRIACT 1800	Corrosion control of condensate piping	Near main steam pipes of HRSG boilers
NALCO 7280	Antiscalant for use in RO unit	Water treatment building/laboratory
NALCO ELIMIN-OX	Oxygen scavenger for use in process feedwater to deaerator	Near each HRSG
NALCO 7408	Oxygen scavenger for use upstream of RO unit	Water treatment building/laboratory
NALCO 22106 or NALCO 7213	Chelate injected into suction of boiler feed pumps	Near each HRSG
Lubricating Oil	Rotating equipment	Contained within equipment, STG lube oil module, and CTG accessory module

TABLE 8.12-2
Location of Hazardous Materials

Chemical	Use	Storage Location
Mineral Insulating Oil	Transformers/switchyard	Contained within transformers and switches
Citric Acid	Chemical cleaning of HRSG	Not stored – brought onsite once every 3 to 5 years
Hydrochloric Acid	Chemical cleaning of HRSG	Not stored – brought onsite once every 3 to 5 years
Hydroxyacetic Acid	Cleaning of HRSG feedwater system prior to initial startup	Not stored – used once
Formic Acid	Cleaning of HRSG feedwater system prior to initial startup	Not stored – used once
Various cleaning chemicals (e.g., ammonium biflouride, sodium carbonate, sodium nitrate)	Chemical cleaning of HRSG	Water treatment building/laboratory
Various laboratory reagents	Laboratory analysis	Water treatment building/laboratory

Note: Commercial brand names may be substituted with equivalent substances, pending supplier availability.

8.12.4 Potential Environmental and Human Health Effects

Hazardous materials to be used at the CPP during construction and operation were evaluated for hazardous characteristics. That evaluation is discussed in this section.

Potential health effects to humans and the environment are outlined for the construction phase (Section 8.12.4.1) and operations and maintenance phase (Section 8.12.4.2). Measures to mitigate the potential effects from the hazardous materials are presented in Section 8.12.8.

8.12.4.1 Construction Phase

Hazardous materials to be used during construction of the project and its associated linear facilities will be limited to gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, various lubricants, paint, and paint thinner. No acutely hazardous materials will be used or stored on-site during construction. 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 on-site during construction are small, relative to the quantities used during operation. Maintenance personnel will be trained to handle the materials. The most likely possible incidents will involve the dripping of fuels, oil, and grease from construction equipment. An accident involving a service or refueling truck would present the worst-case scenario for the release of hazardous materials.

The small quantities of fuel, oil, and grease that may drip from construction equipment will have low relative toxicity and concentrations, and will be biodegradable. Equipment refueling will be performed away from water bodies to prevent contamination of water in the event of a fuel spill. If there is a large spill from a service or refueling truck, contaminated soil will be placed into barrels or trucks by service personnel for off-site

disposal as a hazardous waste at a permitted hazardous waste transfer, storage, and disposal (TSD) facility. If a spill involves hazardous materials equal to or greater than the specific reportable quantity (42 gallons for petroleum products), all federal, state, and local reporting requirements will be followed. In the event of a fire or injury, the local fire department will be called (Herald Station No. 88 or Station No. 87). Handling procedures for the hazardous materials to be used on-site during construction are presented in Section 8.12.8.1.

In conclusion, due to the small quantities of hazardous materials handled at the site and along the gas supply and electric transmission lines during construction, the potential for environmental effects from the use of these is small.

8.12.4.2 Operations Phase

Several hazardous materials, including three acutely hazardous materials, will be stored at the generating site during CPP operation. Some of these materials will be stored at the generating site continuously. Others will be brought on-site, used, and then not used on-site again for several years, while still others will be on-site at startup, used, and then never used again. Hazardous materials will not be stored or used in the gas supply line, water supply line, or electric transmission line corridors during operations.

8.12.4.2.1 At the Generating Station Site

The following hazardous and acutely hazardous materials will be used and/or stored at the generation station site during operation (note: commercial brand names listed may be substituted with equivalent substances, pending supplier availability).

Continuously On-site:

- Aqueous Ammonia (acutely hazardous)—To control nitrous oxide (NO_x) emissions through selective catalytic reduction (1-18,000-gallon tank, 15,000 gallons of liquid, 29 percent solution)
- NALCO 356 (acutely hazardous)—For corrosion control of condensate piping (6,800 gallons, liquid, 20 to 40 percent solution), or NALCO TRIACT 1800 (acutely hazardous) - (6,800 gallons, liquid, 10 to 20 percent solution)
- Sulfuric Acid—For circulating water pH control of cooling tower water (if required). 300-gallon tote size container (one per cooling tower), liquid, 93 percent solution.
- Sodium Hypochlorite (i.e., bleach) —Biocide for condenser cooling water system (16,800 gallons, liquid, 10 percent solution)
- Sodium Hydroxide (e.g., NALCO 7383) —For circulating water pH control (if necessary). 300-gallon tote size container (one per cooling tower), liquid, 50 percent solution.
- Disodium Phosphate—For boiler water scale control (1,900 pounds, granular solid)
- Trisodium Phosphate—For boiler water scale control (1,900 pounds, granular solid)
- NALCO 7280 Scale Inhibitor—Sodium hexameta phosphates, organophosphonates, and poly-acrylates; used as a scale inhibitor in RO process (840 gallons, liquid)

- Scale Inhibitor (various)—Sodium tolyltriazole; used to reduce scale formation in circulating water system (10,000 gallons, liquid)
- STABREX ST70—Sodium hydroxide and sodium hypobromite; biocide in cooling tower water (6,800 gallons, liquid)
- ELIMIN-OX—Carbohydrazide; oxygen scavenger in process feedwater to deaerator (6,800 gallons, liquid-non-hazardous)
- NALCO 7408—Sodium bisulfite; oxygen scavenger upstream of RO unit (840 gallons, liquid)
- NALCO 22106, or NALCO 7213—Sodium polyacrylate and aryl sulfanate; chelate injected into suction of boiler feed pumps (6,800 gallons, liquid)
- NALCO 7213—Tetrasodiumethylenediaminetetraacetate, for boiler feedwater treatment (3,400 gallons, liquid)
- Mineral Insulating Oil—Contained in transformer systems (274,000 gallons, liquid)
- Lubrication Oil—For gas turbine and steam turbine bearings (65,000 gallons, liquid)
- Various Detergents—Combustion turbine compressor periodic cleaning (340 gallons, liquid)
- Various Laboratory Reagents—For water/wastewater analysis (small amounts, usually less than 10 gallons each, liquid and granular solid)

Periodically On-site:

- Hydrochloric Acid—For chemical cleaning of HRSG (100 gallons initially and once every 3 to 5 years, liquid, 30 percent solution)
- Ammonium Bifluoride—For chemical cleaning of HRSG (200 pounds initially and once every 3 to 5 years, solid crystals)
- Citric Acid—For chemical cleaning of HRSG (170 pounds initially and once every 3 to 5 years, solid powder)
- Sodium Carbonate—For chemical cleaning of HRSG and neutralization (500 pounds initially and once every 3 to 5 years, solid powder)
- Sodium Nitrate—For chemical cleaning of HRSG (500 pounds initially and once every 3 to 5 years, solid crystals)

Once On-site:

- Hydroxyacetic Acid—For chemical cleaning of HRSG feedwater system (170 gallons prior to startup, solid crystals)
- Formic Acid—For chemical cleaning of HRSG feedwater system (170 gallons prior to startup, liquid)

Table 8.12-3 presents information about these materials, including trade and chemical names, Chemical Abstract Service (CAS) numbers, maximum quantities on-site, hazardous characteristics, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Superfund Amendments and Reauthorization Act (SARA) Title III reportable quantities (RQ), La Follette Bill threshold planning quantities (TPQ), and status as a Proposition 65 chemical (a chemical known to be carcinogenic or cause reproductive problems in humans).

The hazardous materials to be stored include such incompatible chemicals as sodium hypochlorite and ammonia or sodium hydroxide, sodium hypochlorite, and sulfuric acid. Mixing these chemicals can generate toxic gases. Measures will be taken to keep incompatible chemicals separate.

Potential scenarios for effects on the environment and/or human health from exposure to hazardous materials during CPP operation include accidental releases, accidental mixing of incompatible chemicals, fires, and injury to facility personnel from contact with a hazardous material, even though not accidentally released. The accidental release of the acutely hazardous material aqueous ammonia might present the most serious potential for effects on the environment and/or human health. Toxicity characteristics and the exposure level criteria for this chemical and the other acutely hazardous chemicals, cyclohexylamine and sulfuric acid, are shown in Table 8.12-4.

Pure ammonia (NH_3) is a volatile, acutely hazardous chemical that is stored under pressure as a liquid and becomes a toxic gas if released. Ammonia gas is very soluble in water. Aqueous ammonia consists of a solution of ammonia and water. The aqueous ammonia concentration proposed for use at the CPP is 25 to 29 percent ammonia (and 75 to 71 percent water). If the aqueous ammonia leaks or is spilled, the ammonia in solution will gradually escape or evaporate as a gas into the atmosphere. The odor threshold of ammonia is about 5 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 Section 8.7, Worker Health and Safety). In a catastrophic accident, toxic ammonia gas could migrate off-site and affect the health of humans at locations surrounding the facility (see Section 8.12.5). Facility design will minimize the potential for harm to humans located off-site (see Section 8.12.8.2.1).

NALCO 356 contains cyclohexylamine, which is classified as an acutely hazardous material, and morpholine, which is classified as a hazardous material. Cyclohexylamine is corrosive to the eyes and skin and, depending on the length of exposure, can cause permanent eye damage and third degree burns to the skin. Morpholine is also a severe eye, skin, and mucous membrane irritant, and it can cause kidney damage. However, neither of these chemicals is particularly volatile, and both are soluble in water, which constitutes 50 to 75 percent of

TABLE 8.12-3
CPP Chemical Inventory for 1000 MW Facility

Trade Name	Chemical Name	CAS[a] Number	Maximum Quantity On-site	Hazardous Characteristics	CERCA SARA RQ[b]	LaFollette Bill TPQ[c]	Prop 65
Acutely Hazardous Materials							
Aqueous Ammonia (29% solution)	Ammonium Hydroxide	1336-21-6 (for NH3 -H 2O)	1-18,000-gal. Tank, 15,000-gal. Solution, 33,000 lb. NH3	Corrosive Volatile	100 lb.	500 lb.	No
NALCO 356	Cyclohexylamine (20 to 40%) Morpholine (5 to 10%)	108-91-8 110-91-8	6,800 gal.	Corrosive	10,000 lb.[d]	10,000 lb.[d]	No No
NALCO TRIACT 1800	Cyclohexylamine (10 to 20%) Ethanolamine (10 to 20%) Methoxypropylamine (10 to 20%)	108-91-8 141-43-5 5332-73-0	6,800 gal.	Corrosive	100,000 lb.[d] [d]	10,000 lb.[d] [d]	No No No
Sulfuric Acid	Sulfuric Acid	7664-93-9	600 gal.	Corrosive	1,000 lb.	1,000 lb.	No
Hazardous Materials							
Bleach	Sodium Hypochlorite	7681-52-9	16,800 gal.	Corrosive	100 lb.	[d]	No
NALCO 7383	Sodium Hydroxide (50%)	1310-73-2	600 gal.	Corrosive	1,000 lb.	[d]	No
Disodium Phosphate	Sodium Phosphate	7558-79-4	1,900 lb.	Toxic	5,000 lb.	[d]	No
Trisodium Phosphate	Tri-Sodium Phosphate	7601-54-9	1,900 lb.	Toxic	5,000 lb.	[d]	No
NALCO 8306 Plus	Sodium Tolyltriazole	64665-57-2	10,000 gal.	Toxic	[d]	[d]	No
Hydrochloric Acid	Hydrochloric Acid	7647-01-0	100 gal.	Corrosive	5,000 lb.	[d]	No
Citric Acid	Hydroxy-propionic-tricarboxylic Acid	77-92-9	170 lb.	Corrosive	[d]	[d]	No
Hydroxyacetic Acid	Gyrolic Acid	None	170 gal.	Corrosive	[d]	[d]	No
Formic Acid	Methanoic Acid	64-18-6	170 gal.	Corrosive	5,000 lb.	[d]	No
STABREX ST70	Sodium Hydroxide (1 to 5%) Sodium Hypobromite (10 to 20%)	1310-73-2 13824-96-9	6,800 gal.	Corrosive/Toxic	1,000 lb.	[d]	No
NALCO 7280	Polyacrylic Acid (20 to 40%)	Trade Secret	840 gal.	Toxic	[d]	[d]	No
NALCO ELIMIN-OX	Carbohydrazide	497-18-7	6,800 gal.	Nonhazardous	None	None	No
NALCO 7408	Sodium Bisulfite (40 to 70%)	7631-90-5	840 gal.	Corrosive	5,000 lb.	[d]	No
NALCO 22106	Sodium Polyacrylate Aryl Sulfonate	N/A	6,800 gal.	Toxic	[d]	[d]	No

TABLE 8.12-3
CPP Chemical Inventory for 1000 MW Facility

Trade Name	Chemical Name	CAS[a] Number	Maximum Quantity On-site	Hazardous Characteristics	CERCA SARA RQ[b]	LaFollette Bill TPQ[c]	Prop 65
NALCO 7213	Tetrasodium ethylenedia-minetetraace-tate (10 to 20%)	64-02-8	3,400 gal.	Corrosive	[d]	[d]	No
Mineral Insulating Oil	Oil	None	274,000 gal.	Combustible	42 gal.[e]	[d]	Yes
Lubrication Oil	Oil	None	65,000 gal.	Flammable	42 gal.[e]	[d]	Yes
Ammonium bifluoride	Ammonium bifluoride	1341-49-7	200 lb. initially and once every 3 to 5 years	Corrosive/Toxic	100 lb.	[d]	No
Sodium carbonate	Sodium carbonate	497-19-8	500 lb. initially and once every 3 to 5 years	Corrosive/Toxic	[d]	[d]	No
Sodium nitrate	Sodium nitrate	7631-99-4	500 lb. initially and once every 3 to 5 years	Toxic	[d]	[d]	No
Detergents	Various	None	340 gal.	Toxic	[c]		
Laboratory Reagents (liquid)	Various	None	40 gal.	Toxic	[c]		
Laboratory Reagents (solid)	Various	None	340 lb.	Toxic	[c]		

[a] CAS Chemical Abstract Service
[b] Reportable quantity per CERCLA. 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.
[c] Threshold Planning Quantity. If quantities of acutely 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.
[e] Must be reported if it does or will reach California state waters or if the quantity released is a “harmful quantity.”

TABLE 8.12-4
Acutely Hazardous Materials

Name	Toxic Effects	Exposure Levels-Pure NH3
Aqueous Ammonia (29% solution)	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 = 18 mg/m3 NIOSH STEL = 35 mg/m3 Hazardous Concentrations IDLH = 300 ppm LD50 = 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
Cyclohexylamine	Caustic/corrosive to skin, eyes, and mucous membranes. Systemic effects include nausea, vomiting, anxiety, restlessness, and drowsiness.	Occupational Exposures PEL = 40 mg/m3 OSHA TLV = 40 mg/m3 ACGIH TWA = 10 ppm STEL = None set Hazardous Concentrations LD50 = 779 mg/kg – oral, albino rats LD50 = 2,055 mg/kg – dermal, albino rabbits Sensitive Receptors ERPGs = Not Available
Sulfuric acid	Irritates eyes, nose and throat. Ingestion and inhalation may cause pulmonary edema, bronchitis, emphysema, conjunctivitis, stomatis, dental erosion, and tracheobronchitis. Contact causes severe burns of the skin and eyes, and dermatitis.	Occupational Exposures PEL = 1 mg/m3 OSHA STEL = 3mg/m3 Hazardous Concentrations IDLH = 80mg/m3 TCLO = 3mg/m3/24 weeks inhalation human LDLO = 135 mg/kg – man Sensitive Receptors ERPGs = Not Available

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
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

NALCO 356. The maximum quantity of NALCO 356 stored on-site will be 6,800 gallons, the maximum quantity of pure cyclohexylamine will be 2,700 gallons, and the maximum quantity of pure morpholine will be 700 gallons. NALCO TRIACT 1800 also contains cyclohexylamine at a concentration of 10 to 20 percent. Because of the low volatility of these chemicals and the relatively small quantities stored, the off-site threat is considered small. The hazard to facility workers will be mitigated as described below for sulfuric acid in the following paragraphs.

Sulfuric acid, an acutely hazardous material, 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. The potential for harm to humans off-site is, therefore, minimal. The hazard to facility workers will be mitigated by facility safety equipment, hazardous materials training, and emergency response planning (see Sections 8.7 and 8.12.8.4). An RMP, as required under federal regulations (40 Code of Federal Regulations [CFR] 68) and the California Health and Safety Code (Sections 25531 to 25543.3), will be developed to describe these mitigation measures and other requirements (see Section 8.12.8.4). An RMP is required for substances described in Section 112(r)(5) of the Clean Air Act (CAA) and listed in Appendix A of Part 355 of Subchapter J of Chapter I of Title 40 of the CFR that are handled or stored in quantities above certain levels.

The remaining materials in Table 8.12-5 are also hazardous materials, but they pose less threat to humans than the aqueous ammonia, cyclohexylamine, and sulfuric acid. Two of the materials, hydroxyacetic acid and formic acid, will be used in relatively small amounts and only once, prior to facility startup. Three more of the materials, hydrochloric acid, citric acid, and sodium carbonate, will be used at the site only once every 3 to 5 years and (except for hydrochloric acid) in relatively small amounts. However, most of the hazardous materials are corrosive and are a threat to humans, particularly workers at the site, if inhaled, ingested, or contacted by skin. The hazardous materials and their toxic and other characteristics are summarized in Table 8.12-5.

8.12.5 Off-site Migration Modeling

Because there is some human activity in the vicinity of the proposed CPP site, a vulnerability analysis will be performed during the AFC process. The analysis will assess the risk to humans at various distances from the site if a spill or rupture of the aqueous ammonia storage tank were to occur or if a spill from the supply truck were to occur while refilling the storage tank. Based on analyses submitted in previous CEC siting proceedings, the Applicant is confident that an analysis for CPP will show that there is minimal risk to people located off-site. If simulation modeling is required, the protocol will include the simulation of a tank rupture using a model designed to simulate gas evaporation from a pool of solution containing the gas. Possible models are ALOHA or a model from HG Systems. ALOHA was developed by the National Safety Council.

The worst-case scenario for modeling assumes the aqueous ammonia storage tank is punctured, has a 5-inch-diameter hole, and empties within 10 to 30 minutes into a catch basin or bermed area located beneath the tank that will contain the entire contents of the tank. Other parameters include an atmospheric stability classification of “F” and a wind speed of 1.0 meter/second. Concentric distributions of the ammonia plume will be

TABLE 8.12-5
Toxicity of Hazardous and Acutely Hazardous Materials

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability[a]
Aqueous Ammonia	Colorless gas with pungent odor.	Corrosive: Irritation to permanent damage from inhalation, ingestion, and skin contact.	Acids, halogens, strong oxidizers, salts of silver and zinc.	Noncombustible in liquid form. Vapors are combustible, but difficult to burn.
NALCO 356 Cyclohexylamine (20 to 40%) Morpholine (5 to 10%)	Clear, light yellow/green liquid.	Corrosive: Irritation to eyes and skin. Can cause kidney damage.	Strong oxidizers and acids. SO_2 or acidic bisulfite products.	Flammable.
NALCO-TRI-ACT 1800 Cyclohexylamine (10 to 20%) Ethanolamine (10 to 20%) Methoxypropylamine (10 to 20%)	Clear, colorless to light yellow.	Corrosive: Irritation to eyes and skin. Can cause liver damage.	Strong acids, inorganic nitrites, or nitrous oxide.	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.
Sodium Hypochlorite	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 Hydroxide (NALCO 7383)	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.
Disodium Phosphate	White powder.	Toxic: Toxic by ingestion.	None.	Non-flammable.
Trisodium Phosphate	Colorless crystals.	Corrosive and Toxic: Toxic by ingestion. Irritant to tissue.	None.	Non-flammable.
Scale Inhibitor (NALCO-8306 Plus) (Sodium Tolytriazole)	Yellow green liquid.	Corrosive and Toxic: Slight to moderately toxic. Irritation to skin and eyes.	Strong acids.	Non-flammable.

TABLE 8.12-5
Toxicity of Hazardous and Acutely Hazardous Materials

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability[a]
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.
Citric Acid	Translucent crystals.	None.	None.	Non-flammable.
Hydroxyacetic Acid	Colorless crystals.	Corrosive and Toxic: Toxic by inhalation, ingestion, and dermal contact. Irritant to skin and tissue.	Strong bases, strong reducing and oxidizing agent.	Combustion is possible at elevated temperatures or if in contact with an ignition source.
Formic Acid	Colorless, fuming liquid.	Corrosive: Irritant to skin and tissue.	Strong oxidizers, strong caustics, concentrated sulfuric acid.	Combustible.
STABREX ST70 Sodium Hydroxide (1-5%) Sodium Hypobromite (10-20%)	Clear, light yellow liquid.	Corrosive: Irritant to eyes and skin. Harmful if ingested or inhaled.	Strong acids. Organic materials. Sodium hypochlorite.	Non-flammable.
NALCO 7280 Polyacrylic Acid	Clear to slightly turbid yellow.	Toxic: Kidney damage. May cause bone fragility.	Reactive salts (nitrites and sulfites).	Non-flammable.
ELIMIN-OX Carbohydrazide	Colorless liquid.	Slightly Toxic: Low human hazard.	Mineral acids, nitrites, and strong oxidizers.	Non-flammable.
NALCO 7408 Sodium Bisulfite	Yellow liquid.	Corrosive: Irritation to eyes, skin, and lungs. May be harmful if digested.	Strong acids and oxidizers.	Non-flammable.
NALCO 22106 Sodium Polyacrylate Aryl Sulfonate	Clear to slightly yellow.	Toxic: Possibly harmful if swallowed.	None known.	Non-flammable.
NALCO 7213 Tetrasodium Ethylenediaminetetraa ce-tate (10-20%)	Clear, yellow to amber.	Corrosive and Toxic: Moderate irritation to eyes and skin. Moderate toxicity.	Strong acids.	Combustible.

TABLE 8.12-5
Toxicity of Hazardous and Acutely Hazardous Materials

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability[a]
Ammonium biflouride	White crystals.	Corrosive and Toxic: Caustic poison and strong irritant.	None.	Non-flammable.
Sodium carbonate	White crystals or powder.	Corrosive and Toxic: Mildly toxic. Irritation to eyes and skin.	Aluminum, Phosphorus (V), Oxide, Sulfuric Acid, Fluorine, Lithium, 2, 4, 6-trinintrotoluene.	Non-flammable.
Sodium nitrate	Colorless crystals.	Toxic: Mildly toxic by ingestion.	Acetic Anhydride, Aluminum Powder, Antimony Powder, Barium Thiocyanate, Cyanides, Bitumen, Born Phosphide, Magnesium, Metal Amidosulfates, Organic Matter, Perosyformic Acid, Sodium Hypophosphate, Wood.	Non-flammable.
Laboratory Reagents	Liquid and solid.	Refer to individual chemical labels.	Refer to individual chemical labels.	Refer to individual chemical labels.
Mineral Oil	Oily, clear liquid.	Minor health hazard.	Sodium hypochlorite.	Can be combustible depending on manufacturer.
Lubrication Oil	Oily, dark liquid.	Hazardous if ingested.	Sodium hypochlorite.	Flammable.

Data was obtained from Material Safety Data Sheets (MSDSs) and “Hazardous Chemical Desk Reference, 2nd Edition,” by Richard J. Lewis, Sr., 1991.
A 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.

plotted around the ruptured tank at concentrations of 75, 200, 300, 1,000, and 2,000 ppm. Based upon this analysis, mitigation measures will be selected to reduce risk to an acceptable level.

8.12.6 Fire and Explosion Risk

As shown in Table 8.12-5, many of the hazardous materials are noncombustible. Aqueous ammonia is incombustible in its liquid state. Ammonia evaporating as a gas from a leak or spill of the liquefied state is combustible within a narrow range of concentrations in air. Both hydroxyacetic acid and formic acid are combustible but will be at the site only once prior to startup and will be handled by the HRSG contractor. The lubrication oil is flammable and will be handled in accordance with a Hazardous Materials Business Plan (HMBP) to be approved by Sacramento County. NALCO 356, which is moderately combustible with a flash point of 192°F, will also be handled in compliance with the HMBP. With proper storage and handling of flammable materials in accordance with the plan, the risk of fire and explosion at the generating facility should be minimal.

The natural gas that will provide CPP with fuel for the combustion turbines, is flammable and could leak from the approximate 26-mile-long supply line that brings gas from the District's main pipeline at Carson Ice-Gen Project. 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 or existing railroad or transmission line easements. To prevent ruptures of the natural gas line beneath the existing railroad right-of-way, UPRR requires that the gas line be encased in a larger pipe or conduit.

The closest Herald fire station is Station No. 88 at 11620 Clay Station Road. The second closest fire station is Station No. 87 at 12746 Ivie Road. Both fire stations are primarily staffed by volunteer firefighters.

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 off-site. Potentially, the two or more migrating releases could combine, thereby posing a greater threat to the off-site 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 off-site from CPP is aqueous ammonia. To determine the potential for cumulative impacts, other sites in the vicinity that store and use ammonia must be identified and analyzed. Due to the remote locations of the plant site, it is not anticipated that other facilities in the vicinity of the plant will use or store ammonia. The Rancho Seco Plant is currently undergoing decommissioning. There is no reported use of ammonia at the nuclear facility (Vista, 2001).

8.12.8 Proposed Mitigation Measures

The following subsections present measures the Applicant plans to take 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 on-site will include small quantities of paint and thinner, solvents, cleaners, sealants, lubricants, and 5-gallon emergency fuel containers. Paint, thinner, solvents, cleaners, sealants, and lubricants will be stored in a locked utility building, handled per the manufacturers' directions, and replenished as needed. Nonhazardous paint will be used if possible. 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 when regular vehicle fueling is unavailable.

Regular fueling and oiling of construction equipment will be performed daily to reduce the potential for accidental releases. Fuel, oil, and hydraulic fluids will be transferred directly from a service truck to construction equipment tanks and will not otherwise be stored on-site. 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 only in designated areas that are either bermed or covered with concrete or asphalt to control potential spills.
- Vehicle and equipment service and maintenance will be conducted only by authorized personnel.
- 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 and disposed of as a hazardous waste (see Section 8.13).
- All containers used to store hazardous materials will be inspected at least once per week for signs of leaking or failure. All maintenance and refueling areas will be inspected monthly. Results of inspections will be recorded in a logbook that will be maintained on-site.

Small spills will be contained and cleaned up immediately by trained, on-site personnel. Larger spills will be reported via emergency phone numbers to obtain help from off-site containment and cleanup crews. All personnel working on the project during the

construction phase will be trained in handling hazardous materials and the dangers associated with hazardous materials. An on-site health and safety person will be designated to implement health and safety guidelines and contact emergency response personnel and the local hospital, if necessary.

8.12.8.2 Operation Phase

During CPP operation, some acutely hazardous materials will be stored on-site. Tables 8.12-4 and 8.12-5 describe the toxicity of the materials. The acutely hazardous materials are aqueous ammonia, sulfuric acid, and cyclohexylamine.

8.12.8.2.1 Aqueous Ammonia

Aqueous ammonia will be used in an SCR process to control NO_x emissions created in the combustion chambers of the combustion turbines. The SCR system will include a reactor chamber, catalyst modules, ammonia storage system, and ammonia injection system. The aqueous ammonia, stored as a liquid solution of 29 percent ammonia and 71 percent water, will be injected into the reactor chamber. The rate of injection will be controlled by a monitoring system that uses sensors to determine the correct quantity of ammonia to feed to the reactor chamber. The reactor chamber will contain the catalyst modules and be located in a temperature zone of the HRSG where the catalyst will be most effective at the desired levels of plant operation.

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

Two to three times a week, a 6,000-gallon tanker truck will deliver aqueous ammonia to CPP, where it will be stored in one 18,000-gallon storage tank.

8.12.8.2.2 Cyclohexylamine

Cyclohexylamine in the form of NALCO 356 or NALCO TRIACT 1800 will be fed into the condensate piping to control corrosion. The feed equipment will consist of a storage tank, pumps, leak detection system, alarm system, and fire detection and protection system. The chemical will be stored in 500- to 700-gallon tanks located near each of the four HRSGs. The tanks will be located above concrete, epoxy-lined containment areas with sufficient capacity to contain the full quantity of a tank in the event of a spill or tank rupture. If exposed to rainfall, the containment areas will be large enough to contain, in addition to a spill, the accumulated rainfall for 24 hours from a 25-year storm.

8.12.8.2.3 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 tote container and two full-capacity piston-diaphragm inhibitor metering pumps. The 300-gallon tote tanks (one tote per cooling tower) will be located near the cooling tower circulating water pumps in a catch basin for accidental spills.

8.12.8.2.4 Hazardous Materials

Sodium hypochlorite will be fed into the water received from the Folsom–South Canal as a biocide before it enters the condenser cooling water system. At buildout, the system will consist of two 10,000-gallon storage tanks, two full-capacity chemical feed pumps, a leak detection system, an alarm system, and a fire detection and protection system. The tanks will be located above concrete containment areas with sufficient capacity to contain the full tank contents plus accumulated rainfall for 24 hours during a 25-year storm.

Sodium hydroxide is used to control circulating water pH. The sodium hydroxide feed equipment will consist of a tote container and two full-capacity metering diaphragm pumps. The tote container will be located near the cooling tower circulating water pumps in a containment basin.

All hazardous materials will be handled and stored in accordance with applicable codes and regulations. 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. Wherever required, double-walled piping will be used to minimize potential releases from ruptured piping. Piping and tanks will be protected from potential traffic hazards by concrete or pipe-type traffic bollards and barriers.

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 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 (Section 8.12.8.4). However, in the event of an emergency, the fire department will call on the City of Sacramento Hazardous Materials Response Team (HMRT) (Siligo, 2001) (see Section 8.8.1.7, Socioeconomics, for additional information). For large spills, cities and counties provide mutual assistance. One of the other HMRTs in the City of Sacramento (at Station #5, #19 and #20) will most likely be the second or backup responder.

8.12.8.3 Transportation/Delivery of Hazardous Materials

Hazardous and acutely hazardous materials will be delivered periodically to CPP. Transportation will comply with all DOT, U.S. Environmental Protection Agency (USEPA), California Department of Toxic Substances Control (DTSC), CHP, and California State Fire Marshal regulations for transporting hazardous materials. 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 acutely hazardous material that will be delivered to CPP is the 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 regulations concerning any of the other hazardous materials delivered to CPP will be complied with fully.

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 (HMBP)

An HMBP is required by the California Code of Regulations (CCR) Title 19 and the Health and Safety Code (Section 25504). The plan will include an inventory and location map of hazardous materials on-site 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)
- MSDS 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 and administered by Sacramento County.

8.12.8.4.2 Risk Management Plan/Process Safety Management Plan

Because an acutely hazardous material will be stored and used at CPP in a quantity that exceeds 500 pounds, an RMP will be required. The requirements for an RMP are found in the CAA and its regulations (40 CFR 68 Subpart G) and under California's Accidental Release Prevention Program (CalARP) pursuant to Health and Safety Code Sections 25331 through 25543.3. The California program is similar to the federal program but is more stringent in some areas. There are three programs under 40 CFR, and the RMP requirements increase in stringency from Program 1 to Program 3. Program 1 applies to facilities where, under a worst-case release assessment, the distance to any public receptor cannot fall within the toxic endpoint release concentration for ammonia of 0.14 mg/L of air. This is about 200 ppm at standard conditions for temperature and pressure. Whether CPP will qualify for Program 1 will not be known for certain until the hazard analysis is completed, as described in Section 8.12.7. Program 3 applies where a chemical is stored at or above its threshold quantity (TQ). Program 2 is for facilities that do not fit into Programs 1 or 3. The TQ for ammonia concentrations of 20 percent or greater is 20,000 pounds of solution, so a Program 3 RMP probably will be prepared for CPP.

The RMP will be filed with and administered by the area's CUPA, which is Sacramento County EMD. The RMP will be in addition to the HMBP and will cover acutely hazardous materials that can produce toxic clouds when inadvertently released. Included in the RMP will be 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:

- Description of the facility
- Accident history of the facility
- History of equipment used at the facility
- Design and operation of the facility
- Site map(s) of the facility
- Piping and instrument diagrams of the facility
- Seismic analysis
- Hazard and operability study
- Prevention program
- Consequence analysis
- Off-site consequence analysis
- Emergency response
- Auditing and inspection
- Record keeping
- Training
- Certification

A Process Safety Management Plan (PSM) probably will not be required under OSHA, because the OSHA regulations list aqueous ammonia for solutions above 44 percent.

8.12.8.4.3 Spill Prevention Control and Countermeasure Plan

Federal and California regulations require a Spill Prevention Control and Countermeasures (SPCC) plan if petroleum products above certain quantities are stored in aboveground storage tanks (AST). 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 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

CPP will store more than the threshold of lubrication oil on-site and will therefore have to prepare an SPCC plan.

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 both of these phases to ensure

that the proposed mitigation measures are complied with 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 CPP. 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 enforce hazardous materials laws primarily. For CPP, the main local agency involved will be the Sacramento County Environmental Management Department. The persons to contact are shown in Table 8.12-6.

TABLE 8.12-6
Agency Contacts

Type Material	Agency	Addresses	Contact	Title	Telephone
Hazardous Materials/ Hazardous Waste	Sacramento County Environmental Management Department (Hazardous Materials Division)	8475 Jackson Road, Suite 230, Sacramento, CA 95826	Anthony Chu	Hazardous Materials Specialist	916/875-8550
Hazardous Materials-RMPs	Sacramento County Environmental Management Department (Hazardous Materials Division)	8475 Jackson Road, Suite 230, Sacramento, CA 95826	Anthony Chu	Hazardous Materials Specialist	916/875-8550
Hazardous Materials Response	Sacramento County Environmental Management Department (Hazardous Materials Division)	8475 Jackson Road, Suite 230, Sacramento, CA 95826	Elise Rothschild	Supervising Hazardous Materials Specialist	916/875-8473
Hazardous Materials Response	City of Sacramento Fire Department – Hazardous Materials Response Team	3230 J Street, Sacramento, CA 95816	Steve Siligo	Captain, Hazardous Materials Coordinator	916/264-1958

8.12.10 Permits Required and Permit Schedule

Sacramento County requires the following permits:

Consolidated Hazardous Materials Permit – An HMBP must be submitted as part of the application for the permit. The permit will be obtained prior to the storage of hazardous materials at the site (including compressed gases).

8.12.11 References

CH2M HILL Personal Communication. 2001. Telephone conversation with Anthony Chu, Hazardous Materials Specialist, Sacramento County Environmental Management Department. June 7.

CH2M HILL Personal Communication. 2001. Telephone conversation with Anthony Chu, Hazardous Materials Specialist, Sacramento County Environmental Management Department. June 12.

CH2M HILL Personal Communication. 2001. Telephone conversation with Glen Hendrickson, Fire Chief for City of Herald, Sacramento County. May 21.

CH2M HILL Personal Communication. 2001. Telephone conversation with Elise Rothschild, Sacramento County Environmental Management Department. June 7.

CH2M HILL Personal Communication. 2001. Telephone conversation with Captain Steve Siligo, City of Sacramento Fire Department, June 6.

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

U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health. 1997. *NIOSH Pocket Guide to Chemical Hazards*.