

## **5.5 Hazardous Materials Handling**

This section discusses the potential effects on human health and the environment from the storage and use of hazardous materials in conjunction with the proposed Contra Costa Generating Station (CCGS) project. Section 5.5.1 describes the existing environment that may be affected, and Section 5.5.2 identifies potential impacts on the environment and on human health from site development. Section 5.5.3 addresses potential cumulative effects, Section 5.5.4 presents proposed mitigation measures, and Section 5.5.5 presents the laws, ordinances, regulations, and standards (LORS) applicable to hazardous materials. Section 5.5.6 describes the agencies involved and provides agency contacts. Section 5.5.7 describes permits required and the permit schedule. Section 5.5.8 provides the references used to develop this section. Hazardous waste management, including handling of potentially contaminated soil and groundwater, is addressed in Section 5.14, Waste Management.

### **5.5.1 Affected Environment**

#### **5.5.1.1 Land Use**

Land use in the vicinity of the project site (discussed in detail in Section 5.6, Land Use) is primarily undeveloped land; agricultural, commercial, and industrial areas; and residential areas. Approximately 556 sensitive receptors (mainly childcare facilities such as in-home daycares, and also including schools, hospitals, and long-term care facilities) are identified within a 6-mile radius of the project site. These include 438 daycare facilities, 76 hospitals and long-term care facilities, and 42 schools that are located within 6 miles of the site. These receptors are listed in Appendix 5.1D, and shown on Figure 5.1-D2. The nearest residences are a trailer park located on Bridgehead Road, approximately 0.2 mile southwest of the project site. This trailer park is a non-conforming residential use in a commercial zoning district. The nearest school to the project site is Orchard Park Elementary, located at 5150 Live Oak Avenue, Oakley, CA, 94561, approximately 0.8 mile south-southeast from the project site. The nearest hospital/long-term health care facility is Sutter Delta Medical Center, which is located at 3901 Lone Tree Way, Antioch, California 94509, and is approximately 5 miles southwest.

#### **5.5.1.2 CCGS Hazardous Materials Use**

The CCGS will use hazardous materials during construction and during project operation. The project will comply with applicable laws and regulations for the storage of these materials to minimize the potential for a release of hazardous materials, and will conduct emergency response planning to address public health concerns regarding hazardous materials storage and use. The following sections describe this use, followed by tables detailing the hazardous materials used, their characteristics, the quantities to be used, and use locations.

##### **5.5.1.2.1 Construction Phase**

Relatively small quantities of hazardous materials will be onsite during construction and will be limited to gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, various lubricants, paint, and paint thinner. There are no feasible alternatives to vehicle 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 service conditions and environment.

No regulated substances, as defined in California's Health and Safety Code, Section 25531, will be used during construction of the project. Therefore, no discussion of the storage or handling of regulated substances during construction is necessary.

#### **5.5.1.2.2 Operations Phase**

Storage locations for the hazardous materials that will be used during operation are described in Table 5.5-1. Table 5.5-2 presents information about these materials, including trade names, chemical names, Chemical Abstract Service (CAS) numbers, maximum quantities onsite, reportable quantities (RQ), California Accidental Release Program (CalARP) threshold planning quantities (TPQ), and status as Proposition 65 chemicals (chemicals known to be carcinogenic or cause reproductive problems in humans). Health hazards and flammability data are summarized for these materials in Table 5.5-3, which also contains information on incompatible chemicals (e.g., sodium hypochlorite and ammonia).

Most of the hazardous substances that will be used by the project are required for oxides of nitrogen (NO<sub>x</sub>) emissions control (i.e., ammonia), treatment and laboratory analyses of process and cooling water, facility maintenance, and lubrication of equipment, or will be contained within transformers and electrical switches. The only regulated substance that will be used for the project is aqueous ammonia; toxicity characteristics and the exposure level criteria for this regulated substance are included in Table 5.5-4 and discussed in Section 5.5.2.3.2.

### **5.5.2 Environmental Analysis**

Construction and operation of the project will involve the use of various hazardous materials and one regulated substance. The use of these materials and their potential to cause adverse environmental and human health effects are discussed in this section.

#### **5.5.2.1 Significance Criteria**

The project could have a significant effect on the environment in terms of hazardous materials handling if it would do the following (California Environmental Quality Act [CEQA] Guidelines Section 15002[g], Appendix G):

- Create a significant hazard to the public or the environment through the routine transport or use of hazardous materials
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment
- Emit hazardous emissions or handle hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school

#### **5.5.2.2 Transportation of Hazardous Materials**

Project operation will require regular transportation of hazardous materials to the project site (see also Section 5.12, Traffic and Transportation). Transportation of hazardous materials will comply with all California Department of Transportation (Caltrans), U.S. Environmental Protection Agency (EPA), California Department of Toxic Substances

Control (DTSC), California Highway Patrol (CHP), and California State Fire Marshal regulations. Aqueous ammonia, a regulated substance, will be delivered to the facility and transported in accordance with California Vehicle Code (CVC) Section 32100.5, which regulates the transportation of hazardous materials that pose an inhalation hazard. Additionally, ammonia will only be transported along approved transportation routes. Compliance with applicable regulations will ensure that impacts from the transportation of hazardous materials will be less than significant.

The City of Oakley has two major truck routes (State Route [SR] 4 and East Cypress Road). The city's 2020 General Plan designates SR 4 Bypass as a truck route that will serve as the primary route for regional goods movements in the area. Main Street/SR 4 will continue to serve as the primary route for goods movements within Oakley, and will be connected to the SR 4 Bypass by Lone Tree Way in Brentwood and by Laurel Road in Oakley.

The proposed route for CCGS is for trucks to either use SR 160, exit at Wilbur Avenue, and turn onto Bridgehead Road, or use SR 4/Main Street and turn onto Bridgehead Road. Additional truck routes include East Cypress Road and Bethel Island Road.

The CVC Sections 35550-35559 regulate the use of trucks on state facilities, including Main Street/SR 4 and SR 160. The City of Oakley regulates the use of trucks on truck routes within the city.

### **5.5.2.3 Hazardous Materials Use**

#### **5.5.2.3.1 Construction Phase**

Construction will involve the transport of limited quantities of hazardous materials to the project site and will pose minor hazards associated with their use. Small oil spills may 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.

The quantities of hazardous materials that will be handled during construction are relatively small. Best Management Practices (BMPs) described in Section 5.5.4.1 will be implemented by contractor personnel. Therefore, the potential for environmental effects will be less than significant.

**TABLE 5.5-1**  
Use and Location of Hazardous Materials

Chemical	Use	Quantity (gallons/lbs/cu ft)	Storage Location	State	Type of Storage
Aqueous ammonia (29.4% NH <sub>3</sub> by weight)	Control NOx emissions through selective catalytic reduction	18,000 gal	Onsite storage tank south of the southern heat recovery generator	Liquid	Continuously onsite
Aqueous ammonia (19 to 29.4%)	Condensate/feedwater/ boiler water and steam pH control, i.e. cycle pH control	400-gal tote	Onsite storage tank south of the southern heat recovery generator	Liquid	Continuously onsite
Anti-scalant (e.g., NALCO PermaTreat® PC-191T)	Inhibit mineral scale in reverse osmosis (RO) membranes	400 gal	West of steam turbine pedestal	Liquid	Continuously onsite
Citric acid	Cleaning of heat-recovery steam generator  Microfiltration (MF) membrane cleaning	625 lbs	Pallet supported chemical storage bags in protected temporary storage location on site.  Water Treatment Building	Solid powder	Initial startup and periodically onsite
Cleaning chemicals/detergents	Periodic cleaning of combustion turbine	3,000 gal	Chemical storage tote or drums at a protected temporary storage location onsite.	Liquid	Continuously onsite
Cleaning chemicals / detergents for membrane-based water treatment systems (MF/RO) (e.g., NALCO PermaClean® PC-77, NALCO PERMACLEAN® PC-40, and NALCO PermaClean® PC-98)	Periodic cleaning of RO, MF, and electrodeionization (EDI) systems	25 gal	Water Treatment Building	Liquid and/or powders	Continuously onsite (used intermittently)
Sanitization chemicals for membrane-based water treatment systems (MF/RO) (e.g., NALCO PermaClean® PC-11)	Periodic cleaning of accumulated biofilms on the membranes of the RO, MF, and electrodeionization (EDI) systems	400 gal	Water Treatment Building	Liquids	Continuously onsite (used intermittently)
Diesel No. 2	Fuel for fire pump	400 gal	Fire Pump Room, located in Water Treatment Building	Liquid	Continuously onsite

**TABLE 5.5-1**  
Use and Location of Hazardous Materials

Chemical	Use	Quantity (gallons/lbs/cu ft)	Storage Location	State	Type of Storage
Hydraulic fluid (e.g., Akzo Chemicals Fyrquel®)	Steam turbine control valve actuators	300 gal	Hydraulic oil reservoir beneath the steam turbine pedestal and drums storage in Lubricant Storage Shed	Liquid	Continuously onsite
Laboratory reagents	Water/wastewater laboratory analysis	10 gal	Chemical storage cabinets (stored in original chemical storage containers/bags) in lab areas located in steam cycle sample enclosure and Water Treatment Building	Liquid and granular solid	Continuously onsite
Lubrication oil	Lubricate rotating equipment (e.g., combustion turbine and steam turbine bearings)	20,000 gal	Lubricating oil reservoirs adjacent to the combustion turbines and steam turbine and drum storage in Lubricant Storage Shed	Liquid	Continuously onsite
Mineral insulating oil	Transformers	82,000 gal	Transformer tanks and drum storage in Lubricant Storage Shed	Liquid	Continuously onsite
Oxygen scavenger (e.g., NALCO ELIMIN-OX)	Oxygen scavenger for condensate/feedwater/ boiler water conditioning	500 gal	West of steam turbine pedestal	Liquid	Continuously onsite
Amine solution (e.g., NALCO 5711)	Condensate/feedwater/ boiler water and steam pH control (i.e., cycle pH control)	400 gal	West of steam turbine pedestal	Liquid	Continuously onsite
Bromine-containing solution (e.g., NALCO STABREX® ST20)	Evaporative fluid cooler (i.e., wet surface air cooler) biocide Fire/Service Water Storage Tank biocide	600 gal	Adjacent to the evaporative fluid cooler and Water Treatment Building	Liquid	Continuously onsite
Sodium dichloroisocyanurate/ Sodium bromide (e.g., NALCO TOWERBROM® 960)	Evaporative fluid cooler (i.e., wet surface air cooler) biocide	25 gal	Water Treatment Building and adjacent to the evaporative fluid cooler	Liquid	Continuously onsite (used intermittently)
Sodium bisulfite (NaHSO <sub>3</sub> ) (e.g., NALCO PERMA-CARE® PC-7408)	Reduce oxidizers in RO feed to protect the RO membranes	500 gal	Water Treatment Building	Liquid	Continuously onsite

**TABLE 5.5-1**  
Use and Location of Hazardous Materials

Chemical	Use	Quantity (gallons/lbs/cu ft)	Storage Location	State	Type of Storage
Sulfuric acid (93%)	Evaporative fluid cooler (i.e., wet surface air cooler) pH control RO feedwater pH control	600 gal	Water Treatment Building and adjacent to the evaporative fluid cooler	Liquid	Continuously onsite
Sodium hydroxide (NaOH) solution (20% to 50%)	MF membrane cleaning	400 gal	Water Treatment Building	Liquid	Continuously onsite
Sodium hypochlorite (12.5% trade)	Fire/service water storage tank biological control MF system membrane cleaning Evaporative fluid cooler biocide	600 gal	Water Treatment Building and adjacent to the evaporative fluid cooler	Liquid	Continuously onsite
Hydrochloric acid	MF system membrane cleaning	25 gal	MF treatment area	Liquid	Continuously onsite (used intermittently)
Sodium nitrite	Closed loop cooling corrosion inhibitor	500 lbs	Water Treatment Building and under steam turbine pedestal	Solid	Continuously onsite (used intermittently)
Proprietary corrosion/scale inhibitor (e.g., NALCO TRAC107)	Closed loop cooling corrosion/scale inhibitor	110 gal	Water Treatment Building and under steam turbine pedestal	Liquid	Continuously onsite (used intermittently)
Proprietary non-oxidizing biocide (e.g., NALCO 7330)	Evaporative fluid cooler (i.e., wet surface air cooler) non-oxidizing biocide	400 gal	Adjacent to the evaporative fluid cooler	Liquid	Continuously onsite
Proprietary corrosion/scale inhibitor (e.g., NALCO 3D TRASAR® 247, or NALCO 3D TRASAR® 294)	Evaporative fluid cooler (i.e., wet surface air cooler) corrosion/scale inhibitor	500 gal	Adjacent to the evaporative fluid cooler	Liquid	Continuously onsite
Proprietary corrosion inhibitor (e.g., NALCO 73801WR)	Evaporative fluid cooler (i.e., wet surface air cooler) corrosion inhibitor	400 gal	Adjacent to the evaporative fluid cooler	Liquid	Continuously onsite

**TABLE 5.5-1**  
Use and Location of Hazardous Materials

Chemical	Use	Quantity (gallons/lbs/cu ft)	Storage Location	State	Type of Storage
Diagnostic tracer chemical (e.g., NALCO 3D TRASAR 3DTBR06)	Evaporative fluid cooler (i.e., wet surface air cooler) tracing agent	10 gal	Adjacent to the evaporative fluid cooler	Liquid	Continuously onsite
Trisodium phosphate (Na <sub>3</sub> PO <sub>4</sub> ) or phosphate/sodium hydroxide blend (e.g., NALCO BT-3400 or NALCO BT-4000)	Boiler water pH and corrosion control	400 gal	Phosphate Chemical Feed Area (located under pipe rack east of steam turbine)	Liquid	Continuously onsite
Sulfur hexafluoride	Circuit breakers	200 lbs	Switchyards	Gas	Continuously onsite
Acetylene	Welding gas	540 cu ft	Maintenance/Warehouse Building	Gas	Continuously onsite
Hydrogen	Combustion turbine and steam turbine generator cooling	50,000 cu ft	Tube trailer south of south heat recovery steam generator	Gas	Continuously onsite
Oxygen	Welding gas	540 cu ft	Maintenance/Warehouse Building	Gas	Continuously onsite
Propane	Torch gas	200 cu ft	Maintenance/Warehouse Building	Gas	Continuously onsite
EPA Protocol gases	Calibration gases	2,500 cu ft	CEMS Enclosures	Gas	Continuously onsite
Cleaning chemicals	Cleaning	Varies (less than 25 gal liquids or 100 lbs solids for each chemical)	Admin/Control Building, Maintenance/ Warehouse Building	Liquid or solid	Continuously onsite
Paint	Touchup of painted surfaces	Varies (less than 25 gal liquids or 100 lbs solids for each type)	Maintenance/Warehouse Building	Liquid	Continuously onsite

CEMS = continuous emissions monitoring system  
cu ft = cubic feet  
gal = gallon  
lb = pound

**TABLE 5.5-2**  
Chemical Inventory, Description of Hazardous Materials Stored Onsite, and Reportable Quantities

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ <sup>a</sup>	RQ of Material as Used Onsite <sup>b</sup>	EHS TPQ <sup>c</sup>	Regulated Substance TQ <sup>d</sup>	Prop 65
Aqueous ammonia (29.4% NH <sub>3</sub> by weight)	Aqueous ammonia	7664-41-7	18,000 gal <sup>g</sup>	100 lbs	526 lbs	500 lbs	500 lbs	No
Aqueous ammonia (19%-28% NH <sub>3</sub> by weight)	Aqueous ammonia	7664-41-7	400 gal	100 lbs	357 lbs	500 lbs	500 lbs	No
Anti-scalant	Antiscalant	Various	400 gal	e	e	e	e	No
Citric acid	Citric Acid	77-92-9	625 lbs	e	e	e	e	No
Cleaning chemicals/detergents	Various	None	3,000 gal	e	e	e	e	No
Diesel No. 2	Diesel No. 2	68476-34-6	400 gal	e	e	e	e	No
Hydraulic oil (e.g., Fryquel)	Phosphate ester	None	300 gal	42 gal <sup>f</sup>	42 gal <sup>f</sup>	e	e	No
Laboratory reagents	Various	Various	10 gal	e	e	e	e	No
Lubrication oil	Oil	None	20,000 gal	42 gal <sup>f</sup>	42 gal <sup>f</sup>			No
Mineral insulating oil	Oil	8012-95-1	82,000 gal	42 gal <sup>f</sup>	42 gal <sup>f</sup>			No
Oxygen scavenger (e.g., NALCO ELIMIN-OX)	Oxygen scavenger	None	500 gal	e	e	e	e	No
Amine solution	Amine	2008-39-1	400 gal	e	e	e	e	No
Bromine containing solution	Bromine	7726-95-6	600 gal	e	e	500 lbs	500 lbs	No
Sodium dichloroisocyanurate	Sodium bromide	2893-78-9/7647-15-6	25 gal	e	e	e	e	No
Sodium bisulfite (NaHSO <sub>3</sub> )	Sodium bisulfite	7631-90-5	500 gal	5,000 lbs	5,000 lbs	e	e	No
Sulfuric acid (93%)	Sulfuric acid	7664-93-9	600 gal	1,000 lbs	1,075 lbs	1,000 lbs	1,000 lbs	Yes
Sodium hydroxide (NaOH) (20% to 50%)	Sodium hydroxide	1310-73-2	400 gal	1,000 lbs	800 lbs	e	e	No
Sodium hypochlorite (12.5%)	Sodium hypochlorite	7681-52-9	600 gal	100 lbs	800 lbs	e	e	No
Hydrochloric acid	Hydrochloric acid	7647-01-0	25 gal	5,000 lbs	5,000 lbs	e	15,000 lbs	No
Sodium nitrite	Sodium nitrite	7632-00-0	500 lbs	100 lbs	100 lbs	e	e	No
Trisodium phosphate (Na <sub>3</sub> PO <sub>4</sub> ) (e.g., NALCO 7208)	Trisodium phosphate	7601-54-9	400 gal	e	e	e	e	No



**TABLE 5.5-2**  
Chemical Inventory, Description of Hazardous Materials Stored Onsite, and Reportable Quantities

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ <sup>a</sup>	RQ of Material as Used Onsite <sup>b</sup>	EHS TPQ <sup>c</sup>	Regulated Substance TQ <sup>d</sup>	Prop 65
Sulfur hexafluoride	Sulfur hexafluoride	2551-62-4	200 lbs	e	e	e	e	No
Acetylene	Acetylene	47-86-2	540 cu ft	e	e	e	e	No
Hydrogen	Hydrogen	1333-74-0	50,000 cu ft	e	e	e	e	No
Oxygen	Oxygen	7782-44-7	540 cu ft	e	e	e	e	No
Propane	Propane	74-98-6	200 cu ft	e	e	e	e	No
EPA Protocol gases	Various	Various	2,500 cu ft	e	e	e	e	No
Cleaning chemicals	Various	Various	Varies (less than 25 gal liquids or 100 lbs solids for each chemical)	e	e	e	e	No
Paint	Various	Various	Varies (less than 25 gal liquids or 100 lbs solids for each type)	e	e	e	e	No

<sup>a</sup> RQ for a pure chemical, per the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Superfund Amendments and Reauthorization Act (SARA) (Ref. 40 Code of Federal Regulations [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.

<sup>b</sup> RQ for materials as used onsite. Since some of the hazardous materials are mixtures that contain only a percentage of an RQ, 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  $(100 \text{ lb}) / (10\%) = 1,000 \text{ lb}$ .

<sup>c</sup> Extremely Hazardous Substance (EHS) TPQ (Ref. 40 CFR Part 355, Appendix A). If quantities of extremely hazardous materials equal to or greater than the TPQ are handled or stored, they must be registered with the local Administering Agency.

<sup>d</sup> TQ is from 19 California Code of Regulations (CCR) 2770.5 (state) or 40 CFR 68.130 (federal)

<sup>e</sup> No reporting requirement. Chemical has no listed threshold under this requirement.

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

<sup>g</sup> The ammonia tank capacity is 18,000 gallons; however, the tank is only filled to 85% of its capacity, or 15,300 gallons.

**TABLE 5.5-3**  
**Toxicity, Reactivity, and Flammability of Hazardous Substances Stored Onsite**

<b>Hazardous Materials</b>	<b>Physical Description</b>	<b>Health Hazard</b>	<b>Reactive and Incompatibles</b>	<b>Flammability*</b>
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
Anti-scalant	Amber liquid	May cause slight irritation to the skin and moderate irritation to the eyes	None	Nonflammable
Citric acid	Odorless, white granules	Causes irritation to the skin, gastrointestinal tract, and respiratory tract	Metal nitrates (potentially explosive reaction), alkali carbonates and bicarbonates, potassium tartrate; will corrode copper, zinc, aluminum and their alloys	Slightly 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	Flammable
Hydraulic oil	Oily, dark liquid	Hazardous if ingested	Sodium hypochlorite; oxidizers	Combustible
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
Mineral insulating oil	Oily, clear liquid	Minor health hazard	Sodium hypochlorite; oxidizers	Can be combustible, depending on manufacturer
Oxygen scavenger	Light yellow liquid with sulfurous odor	May cause asthma-like attack if ingested; can cause mild irritation; causes asthmatic signs and symptoms in hyper-reactive individuals	None	Not flammable
Alum	Clear, light green or amber liquid	May irritate the eyes and skin	Alkalis and water reactive materials such as oleum: cause exothermic reactions	Nonflammable
Amine	Clear, pale yellow liquid with phenolic-amine odor	Harmful if swallowed; causes irreversible eye damage	Hazardous polymerization will not occur	Not flammable

**TABLE 5.5-3**  
 Toxicity, Reactivity, and Flammability of Hazardous Substances Stored Onsite

Hazardous Materials	Physical Description	Health Hazard	Reactive and Incompatibles	Flammability*
Bromine	Dark red-brown	Causes eye and skin burns; may cause severe respiratory tract irritation with possible burns; may cause severe digestive tract irritation with possible burns; lachrymator (substance that increases the flow of tears); may cause central nervous system effects; may cause cardiac disturbances; may cause liver and kidney damage	Strong oxidizer	Contact with other material may cause fire
Ferric chloride (30-38%)	Yellow-brown liquid	May cause irritation to the upper respiratory tract, skin, and eyes; repeated or prolonged exposure may cause conjunctivitis; material is toxic by ingestion	Most common metals, aluminum strong bases, strong oxidizing agents, potassium	N/A
Hydrated lime	White as a dry powder, wet slurry or paste	Prolonged contact may irritate or burn skin, especially in the presence of moisture; inhalation of dust may irritate mucous membranes or respiratory passages; direct eye contact may cause permanent damage	Avoid acids, inter-halogens, phosphorus (V) oxide	N/A
Hydrochloric acid	Colorless to light-yellow liquid	Very hazardous in case of skin contact, of eye contact and of ingestion; slight hazard in case of inhalation; skin contact may produce burns. Inhalation may produce severe irritation of respiratory tract; severe over-exposure can result in death	Highly reactive with metals. Reactive with oxidizing agents, organic materials, alkalis, and water	Nonflammable
Magnesium chloride	Deliquescent crystals solid	Slightly hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation	Reactive with oxidizing agents; non-reactive with moisture.	Nonflammable
Sodium bisulfite	Yellow liquid	Corrosive: Irritation to eyes, skin, and lungs; may be harmful if digested	Strong acids and strong oxidizing agents	Nonflammable
Sodium carbonate	White solid (solid powder) and odorless	Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation (lung irritant)	Reactive with acids Slightly reactive to reactive with moisture	Not flammable

**TABLE 5.5-3**  
Toxicity, Reactivity, and Flammability of Hazardous Substances Stored Onsite

Hazardous Materials	Physical Description	Health Hazard	Reactive and Incompatibles	Flammability*
Sodium hydroxide	Solid, white, and odorless	Causes eye and skin burns; hygroscopic; may cause severe respiratory tract irritation with possible burns; may cause severe digestive tract irritation with possible burns	Incompatible with acids, water, flammable liquids, organic halogens, metals, aluminum, zinc, tin, leather, wool, and nitromethane	Not flammable
Sodium hypochlorite	Colorless liquid with strong odor	Harmful by ingestion and inhalation, and through skin contact	Incompatible with strong acids, amines, ammonia, ammonium salts, reducing agents, metals, aziridine, methanol, formic acid, phenylacetoneitrile	Not flammable
Sodium nitrite	White to slightly yellowish. Solid (powdered solid), odorless	Very hazardous in case of eye contact (irritant), of ingestion, of inhalation; hazardous in case of skin contact (irritant); slightly hazardous in case of skin contact (permeator); prolonged exposure may result in skin burns and ulcerations; overexposure by inhalation may cause respiratory irritation; severe overexposure can result in death; inflammation of the eye is characterized by redness, watering, and itching	Highly reactive with combustible materials, organic materials; reactive with reducing agents, metals, acids; slightly reactive to reactive with moisture	Not flammable
Stabilized bromine (e.g., Stabrex ST70)	Clear, light yellow liquid	Corrosive: Irritant to eyes and skin; harmful if ingested or inhaled	Strong acids, organic materials, sodium hypochlorite	Nonflammable
Sulfuric acid	Oily, colorless to slightly yellow, clear to turbid liquid; odorless.	Causes severe skin burns; causes severe eye burns; causes burns of the mouth, throat, and stomach	Nitro compounds, carbides, dienes, alcohols (when heated): causes explosions. Oxidizing agents, such as chlorates and permanganates: causes fires and possible explosions. Allyl compounds and aldehydes: undergoes polymerization, possibly violent. Alkalis, amines, water, hydrated salts, carboxylic acid anhydrides, nitriles, olefinic organics, glycols, aqueous acids: causes strong exothermic reactions.	Not flammable

**TABLE 5.5-3**  
 Toxicity, Reactivity, and Flammability of Hazardous Substances Stored Onsite

Hazardous Materials	Physical Description	Health Hazard	Reactive and Incompatibles	Flammability*
Trisodium phosphate	White crystal	Severe irritant; causes pain and redness; prolonged or repeated contact may cause mild burn	Strong acids	Not flammable
Acetylene	Colorless gas	Asphyxiant gas	Oxygen and other oxidizers including all halogens and halogen compounds; forms explosive acetylide compounds with copper, mercury, silver, brasses containing >66 percent copper and brazing materials containing silver or copper	Flammable
Hydrogen	Colorless, odorless, flammable gas or a colorless, odorless, cryogenic liquid	Asphyxiation, by displacement of oxygen	Strong oxidizers (e.g., chlorine, bromine, oxygen, oxygen difluoride, and nitrogen trifluoride); oxygen/hydrogen mixtures can explode on contact with a catalyst such as platinum	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
Propane	Propane gas (odorant added to provide odor)	Asphyxiant gas; causes frostbite to area of contact.	Strong oxidizing agents and high heat	Flammable
EPA Protocol gases	Gas	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels
Cleaning chemicals	Liquid	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels
Paint	Various colored liquid	Refer to individual container labels	Refer to individual container labels	Refer to individual container labels

Data were obtained from Material Safety Data Sheets (MSDS) and Lewis, 1991.

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

**TABLE 5.5-4**  
Toxic Effects and Exposure Levels of Regulated Substance

Name	Toxic Effects	Exposure Levels-Pure NH <sub>3</sub>
Aqueous Ammonia (29.4 percent solution)	Contact with pure liquid or vapor causes eye, nose, and throat irritation, skin burns, and vesiculation. 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, headache, salivation, nausea, and vomiting. Other symptoms include labored breathing, bloody mucous discharge, bronchitis, laryngitis, hemoptysis, and pneumonitis. Damage to eyes may be permanent, including ulceration of conjunctiva and cornea and corneal and lenticular opacities.	<p>Occupational Exposures:</p> <ul style="list-style-type: none"> <li>• PEL = 35 mg/m<sup>3</sup> OSHA</li> <li>• TLV = 18 mg/m<sup>3</sup> ACGIH</li> <li>• TWA = 25 mg/m<sup>3</sup> NIOSH</li> <li>• STEL = 35 mg/m<sup>3</sup></li> </ul> <p>Hazardous Concentrations:</p> <ul style="list-style-type: none"> <li>• IDLH = 500 ppm</li> <li>• LD<sub>50</sub> = 350 mg/kg – oral, rat ingestion of 3 to 4 ml may be fatal</li> </ul> <p>Sensitive Receptors:</p> <ul style="list-style-type: none"> <li>• ERPG-1 = 25 ppm</li> <li>• ERPG-2 = 200 ppm</li> <li>• ERPG-3 = 1,000 ppm</li> </ul>

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<sub>50</sub> Dose lethal to 50 percent of those tested

mg/kg milligrams per kilogram

mg/m<sup>3</sup> milligrams per cubic meter

PEL OSHA-permissible exposure limit for 8-hour workday

ppm parts per million

STEL Short-term exposure limit, 15-minute exposure

TLV ACGIH threshold limit value for 8-hour workday

TWA NIOSH time-weighted average for 8-hour workday

### 5.5.2.3.2 Project Operation

As stated previously, most of the hazardous substances that will be used by the project are required for NO<sub>x</sub> emissions control (i.e., ammonia), treatment and laboratory analysis of cooling water, facility maintenance, and lubrication of equipment, or will be contained within transformers and electrical switches. Their storage will be carefully contained within designated hazardous materials storage areas and their use will be carefully prescribed in terms of hazardous materials handling plans, facility Health and Safety Plans, and the Hazardous Materials Business Plan (HMBP). For the non-CalARP-regulated materials, therefore, the risk of public exposure and serious hazard is low and would not be significant. The only regulated substance that will be used for the project is aqueous ammonia, described in Table 5.4-4 and as follows.

#### **Aqueous Ammonia**

The CCGS facility will store the aqueous ammonia solution in an 18,000-gallon, horizontal aboveground storage tank (AST). The tank will be surrounded by an individual secondary

containment structure capable of holding the full contents of the tank and accumulated precipitation. The truck unloading area will include a concrete pad, sloped to drain spillage to the storage tank containment sump. The truck unloading station will include a storage tank fill line and vapor return line for pressure equalization between the storage tank and truck.

Aqueous ammonia will be used in a selective catalytic reduction (SCR) process to control NO<sub>x</sub> emissions created in the combustion chambers of the combustion turbines. The SCR system will include catalyst modules (located inside the HRSG), an ammonia storage system, and an ammonia injection system. The aqueous ammonia will be vaporized and injected into the turbine exhaust flow upstream of the catalyst modules. 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 injection system.

Approximately two to five times per month (for a maximum of 37 deliveries per year), a 6,700-gallon tanker truck will deliver aqueous ammonia to the site. The aqueous ammonia storage tanks will be equipped with continuous tank level monitors, automated leak detection system, temperature and pressure monitors and alarms, and emergency block valves.

Because of its hazardous properties, ammonia is classified as a regulated substance, and an accidental release of the aqueous ammonia solution could present a human health hazard. Pure ammonia (NH<sub>3</sub>) is a volatile substance that is very soluble in water. Aqueous ammonia consists of a solution of ammonia and water. If the aqueous ammonia solution were to leak or be released without proper controls, the ammonia in solution could escape or evaporate as a gas into the atmosphere.

Ammonia gas can be toxic to humans at sufficient concentrations. Potential toxic effects of ammonia and acceptable exposure levels are summarized in Table 5.5-4. The odor threshold of ammonia is about 5 ppm, and minor irritation of the nose and throat will occur at 30 to 50 ppm. Ammonia 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 6,000 ppm (Smyth, 1956).

Storage and use of ammonia would be subject to the requirements of the California Fire Code, Article 80, as well as CalARP. Article 80 of the California Fire Code contains specific requirements for control of liquid and gaseous releases of hazardous materials. Secondary containment in the form of a spill containment vault will be provided for the ammonia storage tank and loading area. In addition, the facility will be required to prepare a Risk Management Plan (RMP) in accordance with CalARP, further specifying safe handling procedures for the ammonia as well as emergency response procedures in the event of an accidental release. The RMP, which is discussed in more detail in Section 5.5.4.2.2, will be prepared for the site using updated modeling guidance prior to operation of CCGS.

Because sodium hypochlorite and aqueous ammonia are incompatible chemicals, the sodium hypochlorite will be stored in a bermed area for secondary containment (an area capable of capturing any spills) that will be designed such that it is separated from

ammonia, to eliminate potential interactions/reactions in the event that the chemicals are accidentally released.

With the implementation of these measures, impacts related to the storage and handling of aqueous ammonia will be less than significant.

#### **5.5.2.4 Accidental Release Hazards**

If a chemical release were to occur without proper engineering controls in place, the public could be exposed to harmful vapors, and incompatible chemicals could mix, causing vapors that could also potentially have harmful effects. In addition, an uncontrolled release of liquid chemicals could run off and drain into the stormwater system and potentially degrade water quality. However, the California Fire Code, Articles 79 and 80, includes specific requirements for the safe storage and handling of hazardous materials that would reduce the potential for a release of hazardous materials, and mixing of incompatible materials. The design of the project will incorporate state-of-the-art chemical storage and handling facilities in compliance with the current California Fire Code and other applicable federal, state, and local regulations. With the implementation of these measures, the impacts related to the accidental release of hazardous materials, including ammonia, will be less than significant.

##### **5.5.2.4.1 Offsite Consequences Analysis**

Because there is human activity in the vicinity of the proposed CCGS site, an Offsite Consequences Analysis (OCA) will be performed during the Application for Certification (AFC) process. The analysis will assess the risk to humans at various distances from the site if a spill or rupture of a aqueous ammonia storage tank were to occur or if a spill from the supply truck were to occur while refilling the storage tanks, and will assess the project in relation to the California Energy Commission's (CEC) significance threshold of 75 ppm. The modeling protocol for the OCA for ammonia is presented in Appendix 5.5A.

##### **5.5.2.5 Fire and Explosion Hazards**

Table 5.5-3 describes the flammability for the hazardous materials that will be onsite. Article 80 of the California Fire Code requires all hazardous material storage areas to be equipped with a fire extinguishing system and also requires ventilation for all enclosed hazardous material storage areas.

Aqueous ammonia, which constitutes the largest quantity of hazardous materials stored onsite, is incombustible in its liquid state. Under normal storage conditions, ammonia would not evaporate to the atmosphere because it is contained in a sealed tank that maintains the ammonia in a state that precludes evaporation. In the unlikely event that a release were to occur, ammonia could evaporate directly to the atmosphere. Ammonia vapor is combustible only within a narrow range of concentrations in air. The evaporation rate of aqueous ammonia is similar to water, which is sufficiently low that the lower explosive limit of 15 percent (or 15,000 ppm) will not be reached.

The plant machinery lubrication oil is flammable. In accordance with Article 80 of the California Fire Code, the storage area for the lubrication oil would be equipped with a fire extinguishing system and the lubrication oil would be handled in accordance with an HMBP approved by Contra Costa County Health Services - Hazardous Materials Programs,



East Contra Costa Fire Protection District, and the CEC. With proper storage and handling of flammable materials in accordance with the California Fire Code and the site-specific HMBP, the risk of fire and explosion at the generating facility would be minimal.

The natural gas fuel the facility will use is flammable and could leak from the high-pressure pipeline that brings the gas from the main Pacific Gas and Electric Company (PG&E) transmission pipeline located at the Antioch Terminal, which is adjacent to the project site along Bridgehead Road. Natural gas is composed mostly of methane, but also may contain ethane, propane, nitrogen, butane, isobutene, and isopentane. It is colorless, odorless, tasteless, and is lighter than air. Methane is flammable when mixed in air at concentrations of 5 to 14 percent, which is also the detonation range. Natural gas, therefore, poses a risk of fire and explosion if an accidental release were to occur. However, the risk of a fire and/or explosion would be reduced through compliance with applicable codes, regulations, and industry design/construction standards.

The federal safety and operating requirements for natural gas pipelines are contained in Title 49 of the CFR, Parts 190 through 192. These requirements vary according to population density and land use; the pipeline classes are defined as follows:

- Class 1 includes pipelines in locations with 10 or fewer buildings intended for human occupancy.
- Class 2 includes pipelines in locations with more than 10, but fewer than 46 buildings intended for human occupancy.
- Class 3 includes pipelines in locations with more than 46 buildings intended for human occupancy, or where the pipeline is within 100 yards of any building or small well-defined outside area occupied by 20 or more people on at least 5 days per week for 10 weeks in any 12-month period.
- Class 4 includes pipelines in locations where buildings with 4 or more stories aboveground are prevalent.

The project's pipeline will be designed to meet Class 1 service and will meet California Public Utilities Commission (CPUC) General Order 112-D and 58-A standards, in addition to the federal requirements for gas pipeline construction and safety.

The closest fire station to CCGS is East Contra Costa Fire Protection District Station No. 93 at 212 2<sup>nd</sup> Street in Oakley, CA 94561. The station is approximately 3 miles away and would provide the first response to a fire at the project site, with an approximate 6 minute average response time (CH2M HILL. 2008b). If hazardous materials were involved in the incident, Station No. 93 would be the first onsite, requesting additional resources from the other nine stations in the district. If required, aid would also be provided by the Hazardous Materials Response Team, based at Contra Costa County Health Services - Hazardous Materials Programs, 4333 Pacheco Boulevard, Martinez, CA, 94553. It is a Type II organization and operates 24 hours a day. The Hazardous Materials Response Team has mutual aid agreements with the two other hazardous materials response teams in the county, located in Richmond and San Ramon. Response time for an incident at CCGS would be approximately 30-45 minutes (CH2M HILL. 2008b). The Applicant has approached the fire district to discuss the project's fire protection needs and district's facilities.

### 5.5.2.6 Schools

The nearest school to the CCGS site is Orchard Park Elementary, located at 5150 Live Oak Avenue, Oakley, CA, 94561. It is approximately 0.8 mile south-southeast from the project site. The proposed transportation route for delivery of regulated materials such as aqueous ammonia (and for all other hazardous materials used at the CCGS) will not pass near the school. The proposed route for CCGS is for trucks to either use SR 160, exit at Wilbur Avenue and turn onto Bridgehead Road, or use SR 4/Main Street and turn onto Bridgehead Road.

### 5.5.3 Cumulative Effects

A cumulative effect refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Pub. Resources Code § 21083; CCR tit. 14, §§ 15064(h), 15065(c), 15130, and 15355).

Existing laws and regulations address the handling of hazardous materials and the transportation and use of aqueous ammonia, an acutely hazardous material, and will ensure that hazardous materials at the CCGS are safely managed.

The hypothetical accidental releases of aqueous ammonia that will be evaluated for the CCGS project is described in the OCA modeling protocol in Appendix 5.5A. The Gateway Generating Station (GGS), Contra Costa Power Plant (CCPP), and the proposed Marsh Landing Generating Station (MLGS) are located approximately 0.6 mile and farther northwest of the CCGS site, but not directly adjacent. These are the facilities that would have hazardous materials onsite. The CCPP and GGS currently have aqueous ammonia storage facilities onsite in addition to similar chemicals that are projected for the proposed MLGS. However, only nominal quantities of oils, cleaners, gases, and other hazardous materials are stored at the GGS and CCPP. Most of these materials are stored inside buildings, which would provide containment in the event of a release.

According to the Contra Costa Health Services - Hazardous Material Programs, additional facilities near the CCGS site store reportable quantities of hazardous materials other than ammonia (Contra Costa County, 2009). These facilities, including three gas stations, store both petroleum hydrocarbons, as well as some automotive paint materials. The facilities include Driftwood Marina at 6338 Bridgehead Road, Arco Facility 6301 at 5540 Bridgehead Road, Bridgehead Shell at 5545 Bridgehead Road, and DuPont Kansai at 6004 Bridgehead Road.

Only a natural disaster such as a major earthquake or other catastrophe of low probability could cause simultaneous accidental releases at any combination of these facilities. Simultaneous releases of aqueous ammonia from the existing CCPP or GGS and the proposed MLGS and CCGS projects could potentially cause cumulative impacts if the migrating clouds merged. However, the MLGS OCA and other OCAs for similar facilities show that ammonia vapor plumes at hazardous levels rarely extend more than a few feet from their sources, if properly controlled and protected by containment basins and evaporation retardants. Therefore the likelihood of ammonia vapor plumes combining in concentrations at or above 75 ppm is very improbable. This issue will be addressed further once the OCA is prepared for the CCGS. Existing laws and regulations will thus ensure that the proposed project's incremental effect is not cumulatively considerable.

## 5.5.4 Mitigation Measures

The following sections present measures included in the project to mitigate potential public health and environmental effects of handling hazardous materials and regulated substances during construction and operation.

### 5.5.4.1 Construction Phase

The hazardous materials that would be used during construction present a relatively low public health risk, but could contaminate surface water or groundwater if a release occurred. Use of BMPs would reduce the potential for the release of construction-related fuels and other hazardous materials to stormwater and receiving waters as discussed in Section 5.15, Water Resources. BMPs prevent sediment and stormwater contamination from spills or leaks, control the amount of runoff from the site, and require proper disposal or recycling of hazardous materials.

Construction service personnel will follow general industry health, safety, and environmental BMPs for filling and servicing construction equipment and vehicles. The BMPs are designed to reduce the potential for incidents involving the hazardous materials. They include the following:

- Refueling and maintenance of vehicles and equipment will occur only in designated areas that are either bermed or covered with concrete, asphalt, or other impervious surfaces to control potential spills. Employees will be present during refueling activities.
- 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 hoses.
- 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 appropriate. 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 onsite.

In the unlikely event of a spill, the spill may need to be reported to the appropriate regulatory agencies and cleanup of contaminated soil could be required. 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. 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 onsite health and safety person will be designated to implement health and safety guidelines and to contact emergency response personnel and the local hospital, if necessary.

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 offsite disposal at an appropriate facility in accordance with law. If a spill involves hazardous materials quantities equal to or greater than the specific RQ (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 (East Contra Costa Fire Protection District Fire Station No. 93).

#### **5.5.4.2 Operation Phase**

During facility operation, various hazardous materials and one regulated substance will be stored onsite as shown in Table 5.5-1. Table 5.5-2 presents information about these materials, including trade names, chemical names, CAS numbers, maximum quantities onsite, RQs, CalARP TPQs, and status as Proposition 65 chemicals (chemicals known to be carcinogenic or cause reproductive problems in humans). Health hazards and flammability data are summarized for these materials in Table 5.5-3, which also contains information on incompatible chemicals (e.g., sodium hypochlorite and ammonia). Table 5.5-4 describes the toxicity of the regulated substance and hazardous materials. The following sections list mitigation measures for minimizing the public health risks associated with hazardous material and regulated substance handling during facility operation.

##### **5.5.4.2.1 Hazardous Materials**

All hazardous materials will be handled and stored in accordance with applicable codes and regulations specified in Section 5.5.6. Specific requirements of the California Fire Code that reduce the risk of fire or the potential for a release of hazardous materials that could affect public health or the environment include:

- Provision of an automatic sprinkler system for indoor hazardous material storage areas.
- Provision of an exhaust system for indoor hazardous material storage areas.
- Separation of incompatible materials by isolating them from each other with a noncombustible partition.
- Spill control in all storage, handling, and dispensing areas.
- Separate secondary containment for each chemical storage system. The secondary containment is required to hold the entire contents of the tank plus the volume of water for the fire suppression system that could be used for fire protection for a period of 20 minutes in the event of a catastrophic spill.

In addition, a Business Emergency/Contingency Plan (i.e., HMBP) is required by CCR Title 19 and the Health and Safety Code (Section 25504). In accordance with these regulations, the HMBP will include an inventory and location map of hazardous materials onsite and an emergency response plan for hazardous materials incidents. Specific topics addressed in the plan will include:

- Facility identification
- Emergency contacts
- Chemical inventory information (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 Contra Costa County Health Services – Hazardous Materials Programs, the designated Certified Unified Program Agency (CUPA) for the project site, and will be updated annually in accordance with applicable regulations.

In accordance with emergency response procedures specified in the HMBP, designated personnel will be trained as members of a plant hazardous material response team, and team members will receive the first responder and hazardous material technical training to be developed in the HMBP, including training in appropriate methods to mitigate and control accidental spills. In the event of a chemical emergency, plant personnel will defer to the Contra Costa County Health Services Hazardous Materials Programs. East Contra Costa Fire Protection District Station No. 93 would be the first onsite. Teams from the Contra Costa County Health Services Hazardous Materials Response Team, located at 4333 Pacheco Boulevard in Martinez (approximately 30-45 minute response time to the project site), which is also the CUPA Hazardous Emergency Response Headquarters, will be dispatched to the site simultaneously, if warranted.

#### **5.5.4.2.2 Aqueous Ammonia**

Ammonia is a regulated substance under the federal Clean Air Act (CAA) pursuant to 40 CFR 68 (Subpart G) and the 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.

In accordance with CalARP regulations, an RMP will be prepared for the ammonia tanks. The RMP will include a hazard assessment to evaluate the potential effects of an accidental release, a program for preventing an accidental release, and a program for responding to an accidental release. The specific components of the RMP include:

- 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
- Offsite consequence analysis
- Emergency response
- Auditing and inspection
- Record keeping
- Training
- Certification

The RMP will be filed with the Contra Costa County Health Services – Hazardous Materials Programs, 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.

A Process Safety Management (PSM) plan will not be required under the Occupational Safety and Health Act, because the regulations apply only to aqueous ammonia solutions above 44 percent (29 CFR Part 199).

#### **5.5.4.2.3 Petroleum Products**

Federal and California regulations require a Spill Prevention Control and Countermeasure (SPCC) plan if petroleum products above certain quantities are stored. 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 container, or equal to or greater than 1,320 gallons total (including ASTs, oil-filled equipment, and drums), an SPCC plan must be prepared. Because the facility will store more than 1,320 gallons of petroleum products, an SPCC plan will be prepared.

#### **5.5.4.2.4 Transportation/Delivery of Hazardous Materials and Regulated Substances**

Hazardous materials and one regulated substance will be delivered periodically to the facility. As discussed in Section 5.12, Traffic and Transportation, transportation of hazardous materials will comply with all Caltrans, EPA, DTSC, CHP, and California State Fire Marshal regulations. Under the California Vehicle Code, the CHP has the authority to adopt regulations for transporting hazardous materials in California. Aqueous ammonia, a regulated substance, will be delivered to the facility, and transported in accordance with CVC Section 32100.5, which regulates the transportation of hazardous materials that pose an inhalation hazard. In addition, ammonia will only be transported along approved transportation routes. The proposed route for CCGS is for trucks to either use SR 160, exit at Wilbur Avenue and turn onto Bridgehead Road, or use SR 4/Main Street and turn onto Bridgehead Road. Additional truck routes include East Cypress Road and Bethel Island Road.

#### 5.5.4.2.5 Security Plan

In addition to standard industrial business security measures, CCGS will be preparing a security plan that will include the following elements:

- Descriptions of the site fencing and security gate
- Evacuation procedures
- A protocol for contacting law enforcement in the event of conduct endangering the facility, its employees, its contractors, or the public
- A fire alarm monitoring system
- Measures to conduct site personnel background checks, including employee and routine onsite contractors, consistent with state and federal law regarding security and privacy
- A site access protocol for vendors
- A protocol for hazardous materials vendors to prepare and implement security plans as per 49 CFR 172.800 and to ensure that all hazardous materials drivers are in compliance with personnel background security checks as per 49 CFR Part 172, Subpart I

The plan will also include a demonstration that the perimeter security measures will be adequate. The demonstration may include one or more of the following:

- Security guards
- Security alarm for critical structures
- Perimeter breach detectors and onsite motion detectors
- Video or still camera monitoring system

#### 5.5.4.3 Monitoring

In accordance with applicable federal, state, and local regulations, site personnel would regularly inspect all hazardous materials handling facilities for compliance with applicable regulations and would ensure that any deficiencies were promptly repaired. In addition, the facility would be subject to regular inspections by the East Contra Costa Fire Protection District, which would ensure compliance with appropriate regulatory requirements for hazardous materials and regulated substances handling.

#### 5.5.5 Laws, Ordinances, Regulations, and Standards

The storage and use of hazardous materials and regulated substances at the facility 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 to protect facility workers and the surrounding community from exposure to hazardous and regulated substances. The applicable LORS are summarized in Table 5.5-5 and described below.

**TABLE 5.5-5**  
Laws, Ordinances, Regulations, and Standards for Hazardous Materials Handling

<b>LORS</b>	<b>Requirements/Applicability</b>	<b>Administering Agency</b>	<b>AFC Section Explaining Conformance</b>
<b>Federal</b>			
Section 302, EPCRA (Pub. L. 99-499, 42 USC 11022) Hazardous Chemical Reporting: Community Right-To-Know (40 CFR 370)	Requires one-time notification if extremely hazardous substances are stored in excess of TPQs.	Contra Costa County Health Services – Hazardous Materials Programs	A HMBP will be prepared for submittal to Contra Costa County Health Services – Hazardous Materials Programs (Section 5.5.4.2.1).
Section 304, EPCRA (Pub. L. 99-499, 42 USC 11002) Emergency Planning and Notification (40 CFR 355)	Requires notification when there is a release of hazardous material in excess of its RQ.	Contra Costa County Health Services – Hazardous Materials Programs	An HMBP will be prepared to describe notification and reporting procedures (Section 5.5.4.2.1).
Section 311, EPCRA (Pub. L. 99-499, 42 USC 11021) Hazardous Chemical Reporting: Community Right-To-Know (40 CFR 370)	Requires that MSDSs for all hazardous materials or a list of all hazardous materials be submitted to the SERC, LEPC, and Contra Costa County Health Services – Hazardous Materials Programs	Contra Costa County Health Services – Hazardous Materials Programs	The HMBP to be prepared will include a list of hazardous materials for submission to agencies (Section 5.5.4.2.1).
Section 313, EPCRA (Pub. L. 99-499, 42 USC 11023) Toxic Chemical Release Reporting: Community Right-To-Know (40 CFR 372)	Requires annual reporting of releases of hazardous materials.	Contra Costa County Health Services – Hazardous Materials Programs	The HMBP to be prepared will describe reporting procedures (Section 5.5.4.2.1).
Section 112, CAA Amendments (Pub. L. 101-549, 42 USC 7412) Chemical Accident Prevention Provisions (40 CFR 68)	Requires facilities that store a listed hazardous material at a quantity greater than the TQ to develop an RMP.	Contra Costa County Health Services – Hazardous Materials Programs	A RMP will be prepared and submitted to Contra Costa County Health Services – Hazardous Materials Programs (Section 5.5.4.2.2).
Section 311, CWA (Pub. L. 92-500, 33 USC 1251 et seq.) Oil Pollution Prevention (40 CFR 112)	Requires preparation of an SPCC plan if oil is stored in a single AST with a capacity greater than 660 gallons or if the total petroleum storage (including ASTs, oil-filled equipment, and drums) is greater than 1,320 gallons. The facility will have petroleum in excess of the aggregate volume of 1,320 gallons.	RWQCB	An SPCC will be prepared (Section 5.5.4.2.3).



TABLE 5.5-5

Laws, Ordinances, Regulations, and Standards for Hazardous Materials Handling

LORS	Requirements/Applicability	Administering Agency	AFC Section Explaining Conformance
Pipeline Safety Laws (49 USC 60101 et seq.) Hazardous Materials Transportation Laws (49 USC 5101 et seq.) Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards (49 CFR 192)	Specifies natural gas pipeline construction, safety, and transportation requirements.	U.S. Department of Transportation	The natural gas pipeline will be constructed in accordance with 49 CFR requirements (Section 5.5.2.5)
<b>State</b>			
Health and Safety Code, Section 25500, et seq. (HMBP)	Requires preparation of an HMBP if hazardous materials are handled or stored in excess of threshold quantities.	Cal/OSHA	A HMBP will be prepared for submittal to the Contra Costa County Health Services – Hazardous Materials Programs (Section 5.5.4.2.1).
Health and Safety Code, Section 25531 through 25543.4 (CalARP)	Requires registration with local CUPA or lead agency and preparation of an RMP if regulated substances are handled or stored in excess of TPQs.	Contra Costa County Health Services – Hazardous Materials Programs	A RMP will be prepared and submitted to the Contra Costa County Health Services – Hazardous Materials Programs (Section 5.5.4.2.1).
Health and Safety Code, Section 25270 through 25270.13 (Aboveground Petroleum Storage Act)	Requires preparation of an SPCC plan if oil is stored in a single AST with a capacity greater than 660 gallons or if the total petroleum storage (including ASTs, oil-filled equipment, and drums) is greater than 1,320 gallons. The facility will have petroleum in excess of the aggregate volume of 1,320 gallons.	RWQCB	An SPCC plan will be prepared (Section 5.5.4.2.3).
Health and Safety Code, Section 25249.5 through 25249.13 (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.	OEHHA	The site will be appropriately labeled for chemicals on the Proposition 65 list (Section 5.5.5.2.4).
CVC Section 32100.5.	Establishes the procedures for the state to determine transportation corridors for materials that may pose an inhalation hazard.	Caltrans, CHP	Transportation of aqueous ammonia will follow designated routes (Section 5.5.4.2.4).
CPUC General Order Nos. 112-E and 58-A	Specify standards for gas service and construction of gas gathering, transmission, and distribution piping systems.	CPUC	Construction of the natural gas pipeline will comply with the standards specified in these General Orders (Section 5.5.5.2.5).

**TABLE 5.5-5**  
Laws, Ordinances, Regulations, and Standards for Hazardous Materials Handling

LORS	Requirements/Applicability	Administering Agency	AFC Section Explaining Conformance
<b>Local</b>			
California Code of Regulations Title 8 Section 5189	Develop and implement safety management plans.	Contra Costa County Health Services – Hazardous Materials Programs	Section 5.5.5.3
Contra Costa County Zoning Ordinance 98-48	Requires a Safety Plan and an RMP.	Contra Costa County Planning Department	Section 5.5.5.3
Uniform Fire Code Articles 79 and 80	Require secondary containment, monitoring and treatment for accidental releases of toxic gases.	East Contra Costa Fire Protection District	Section 5.5.5.3

AST = aboveground storage tank  
CAA = Clean Air Act  
CalARP = California Accidental Release Program  
Cal/OSHA = California Division of Occupational Safety and Health  
CPUC = California Public Utilities Commission  
CWA = Clean Water Act  
EPCRA = Emergency Planning and Community Right-to-Know Act of 1986  
LEPC = local emergency planning committee  
MSDS = Material Safety Data Sheet  
OEHHA = Office of Environmental Health Hazard Assessment  
Pub. L. = Public Law  
RMP = Risk Management Plan  
RQ = Reportable Quantities  
RWQCB = Regional Water Quality Control Board  
SERC = State Emergency Response Commission  
SPCC = Spill Prevention Control and Countermeasures  
TPQ = Threshold Planning Quantity  
USC = United States Code

### 5.5.5.1 Federal LORS

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

#### 5.5.5.1.1 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 Occupational Safety and Health Administration (OSHA) and the California Division of Occupational Safety and Health (Cal/OSHA).

#### 5.5.5.1.2 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 (Parts 173), and for transporting hazardous materials in tank cars (Part 179). The

administering agencies for the above authority are the CHP and U.S. Department of Transportation.

#### **5.5.5.1.3 CERCLA**

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

- Section 302 – Requires one-time notification when EHSs are present in excess of their 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 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 EPA Region IX, the National Response Center, and the Contra Costa County Health Services – Hazardous Materials Programs. The Contra Costa County Health Services – Hazardous Materials Programs is the CUPA.

#### **5.5.5.1.4 Clean Air Act**

Regulations (40 CFR 68) under the CAA are designed to prevent accidental releases of hazardous materials. The regulations require facilities storing a TQ or greater of listed regulated substances to develop an RMP, including hazard assessments 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. Aqueous ammonia is a listed substance, and its TQ for solutions of 20 percent and greater is 20,000 pounds of solution.

#### **5.5.5.1.5 Clean Water Act**

The SPCC rule 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 rule is applicable if a facility has a single oil AST with a capacity greater than 660 gallons, total petroleum storage (including ASTs, oil-filled equipment, and drums) greater than 1,320 gallons, or underground storage

capacity greater than 42,000 gallons. The SPCC rule is administered by the local CUPA, which is the Contra Costa County Health Services – Hazardous Materials Programs.

Other related federal laws that address hazardous materials but do not specifically address their handling, include the Resource Conservation and Recovery Act, which is discussed in Section 5.14, Waste Management, and the Occupational Safety and Health Act, which is discussed in Section 5.16, Worker Health and Safety.

#### **5.5.5.1.6 Natural Gas Pipeline Construction and Safety**

Title 40 of the CFR, parts 190 through 192, specifies safety and construction requirements for natural gas pipelines. Part 190 outlines pipeline safety procedures, Part 191 requires a written report for any reportable incident, and Part 192 specifies minimum safety requirements for pipelines.

#### **5.5.5.2 State LORS**

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

##### **5.5.5.2.1 Title 8, California Code of Regulations, Section 339; Section 3200 et seq., Section 5139 et seq. and Section 5160 et seq.**

Section 339 of Title 8 of the CCR lists hazardous chemicals relating to the 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.

##### **5.5.5.2.2 Health and Safety Code Section 25500**

California Health and Safety Code, Section 25500, et seq., and the related regulations in 19 CCR 2620, et seq., require 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 CUPA and to report releases to their CUPA and the State Office of Emergency Services. The TQs 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.

##### **5.5.5.2.3 Health and Safety Code Section 25531 (California Accidental Release Program)**

California Health and Safety Code, Section 25531, et seq., and the CalARP regulate the registration and handling of regulated substances. Regulated substances are any chemicals designated as an extremely hazardous substance by the EPA as part of its implementation of SARA Title III. Health and Safety Code Section 25531 overlaps or duplicates some of the requirements of SARA and the CAA. Facilities handling or storing regulated substances at or above TPQs must register with their local CUPA and prepare an RMP, formerly known as a Risk Management and Prevention Program. The CalARP is found in Title 19, CCR, Chapter 4.5. The TPQ for ammonia is 500 pounds. Portions of the aqueous ammonia process that can be demonstrated to have a partial pressure of the regulated substance in the mixture (solution) under the handling or storage conditions (less than 10 millimeters of mercury) do not count toward the threshold.

#### **5.5.5.2.4 Aboveground Petroleum Storage Act**

The California Health and Safety Code Sections 25270 to 25270.13 ensure compliance with the federal CWA. The law applies to facilities that operate a petroleum AST with a capacity greater than 660 gallons or combined ASTs capacity greater than 1,320 gallons, or oil-filled equipment where there is a reasonable possibility that the tank(s) or equipment 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.

#### **5.5.5.2.5 Safe Drinking Water and Toxics Enforcement Act (Proposition 65)**

This California law requires the state to identify chemicals that cause cancer and reproductive toxicity, contains requirements for informing the public of the presence of these chemicals, and prohibits discharge of the chemicals into sources of drinking water. Lists of the chemicals of concern are published and updated periodically by California’s Office of Environmental Health Hazard Assessment. Some of the chemicals to be used at the facility are on the cancer-causing and reproductive-toxicity lists of the Act.

#### **5.5.5.2.6 Natural Gas Pipeline Construction and Safety**

The CPUC enforces General Order No. 58-A, which specifies standards for natural gas service in the State of California, and General Order No. 112-E, which specifies rules governing the design, construction, testing, operation, and maintenance of natural gas gathering, transmission, and distribution piping systems. The proposed project will connect to an existing PG&E high-pressure natural gas pipeline located at the Antioch Terminal, which is adjacent to the DuPont property along Bridgehead Road.

#### **5.5.5.2.7 California Vehicle Code Section 32100.5**

CVC Section 32100.5 regulates the transportation of hazardous materials that pose an inhalation hazard. Aqueous ammonia, a regulated substance, will be delivered to the facility and transported in accordance with this section by following the designated access routes, as described previously in Section 5.5.4.2.4.

### **5.5.5.3 Local LORS**

The Contra Costa County Health Services – Hazardous Materials Programs is the designated CUPA and is responsible for administering HMBPs, Hazardous Materials Management Plans, SPCC Plans, and RMPs filed by businesses located in the county (CH2M HILL. 2008a). The Contra Costa County Health Services – Hazardous Materials Programs is also responsible under the CUPA program for underground storage tank compliance. In addition, the agency is responsible for ensuring that businesses and industry store and use hazardous materials safely and in conformance with various regulatory codes. The agency 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 firm’s HMBP are accurate (CH2M HILL. 2008a).

Contra Costa County Ordinance 651.2 requires new or modified businesses to complete a Hazardous Materials Business Emergency Plan and Chemical Inventory Forms prior to final approval of a land use permit for a new business or modification of an existing business. Because certain quantities of acutely hazardous materials could pose a threat to the public health and safety and the environment, the Contra Costa County Health Services – Hazardous Materials Programs requires a conditional use permit for all businesses or

government facilities handling acutely hazardous materials in excess of 55 gallons, 500 pounds, or 200 cubic feet.

The Contra Costa County Health Services – Hazardous Materials Programs regulates (1) the implementation of the hazardous material inventory and emergency response plan; and (2) the storage of hazardous materials in underground storage tanks and cleanup of petroleum releases. The Contra Costa County Health Services – Hazardous Materials Programs as well as the East Contra Costa County Fire Prevention District shall be contacted in the event of a release of hazardous wastes or materials to the environment. The Contra Costa County Health Services – Hazardous Materials Programs also assumes enforcement responsibility for the implementation of CCR Title 23. The Applicant will work with local authorities to properly register and handle all hazardous materials onsite.

#### **5.5.5.4 Codes**

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

- CVC, 13 CCR 1160, et seq. – Provides the CHP with authority to adopt regulations for the transportation of hazardous materials in California. The CHP can issue permits and specify the route for hazardous material delivery.
- The California Fire Code, Articles 79 and 80 – The hazardous materials sections 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. The California Fire Code is based on the federal fire guidelines, which include the Uniform Fire Code.
- State Building Standard Code, Health and Safety Code Sections 18901 to 18949 – Incorporates the Uniform Building Code, Uniform Fire Code, and Uniform Plumbing Code.
- The American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section VIII.
- Contra Costa County Code.

#### **5.5.6 Agencies and Agency Contacts**

Several agencies regulate hazardous materials, and they will be involved in regulating the hazardous materials stored and used at CCGS. At the federal level, the EPA 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 CCGS, the primary local agencies with jurisdiction will be the Contra Costa County Health Services – Hazardous Materials Programs and the East Contra Costa Fire Protection District. The persons to contact are shown in Table 5.5-6.

**TABLE 5.5-6**  
Agency Contacts for Hazardous Materials Handling

<b>Issue</b>	<b>Agency</b>	<b>Contact</b>
CUPA for Hazardous Materials Inventory and Emergency Business Plan and Risk Management Plan	Contra Costa County Health Services Hazardous Materials Programs	Randall Sawyer, Director 4333 Pacheco Boulevard Martinez, California 94553 (925) 646-2286 (925) 646-2073 fax rsawyer@hsd.cccounty.us
Fire Department Permits	East Contra Costa Fire Protection District	Jake Gonzalez, Battalion Chief 134 Oak Street Brentwood, CA 94513 (925) 240-2133 jgonzalez@eccfpd.org
Hazardous Materials Response	Contra Costa County Health Services Hazardous Materials Programs	Randall Sawyer, Director 4333 Pacheco Boulevard Martinez, California 94553 (925) 646-2286 (925) 646-2073 fax rsawyer@hsd.cccounty.us  24-hour hotline number for emergencies only: (925) 646-1112

### 5.5.7 Permits and Permit Schedule

The Contra Costa County Health Services – Hazardous Materials Programs requires that project developers obtain the permits listed in Table 5.5-7 before storing hazardous materials on site.

**TABLE 5.5-7**  
Permits and Permit Schedule for Hazardous Materials Handling

<b>Permit</b>	<b>Agency Contact</b>	<b>Schedule</b>
Hazardous Materials Business Plan	Contra Costa County Health Services Hazardous Materials Programs 4333 Pacheco Boulevard Martinez, California 94553 (925) 646-2286 (925) 646-2073 fax	Approximately 60 days before any regulated substance comes onsite
Risk Management Plan	Contra Costa County Health Services Hazardous Materials Programs 4333 Pacheco Boulevard Martinez, California 94553 (925) 646-2286 (925) 646-2073 fax	Approximately 60 days before any regulated substance comes on site

### 5.5.8 References

CH2M HILL. 2008a. Telephone Conversation Record – Sonny Khoo, On-Call Officer, Contra Costa County Health Services – Hazardous Materials Programs, March 26, 2009.

CH2M HILL. 2008b. Telephone Conversation Record – Jake Gonzalez, Battalion Chief, East Contra Costa Fire Protection District, April 01, 2009.

Contra Costa County. 2009. Contra Costa County Health Services – Hazardous Materials Programs website, accessed April 2009 at <http://www.cchealth.org/groups/hazmat/>.

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

Smyth H. F., Jr. 1956. "Improved Communication: Hygienic Standards for Daily Inhalation." *Am. Ind. Hyg. Assoc. Q.* 17 (2): 129-185.