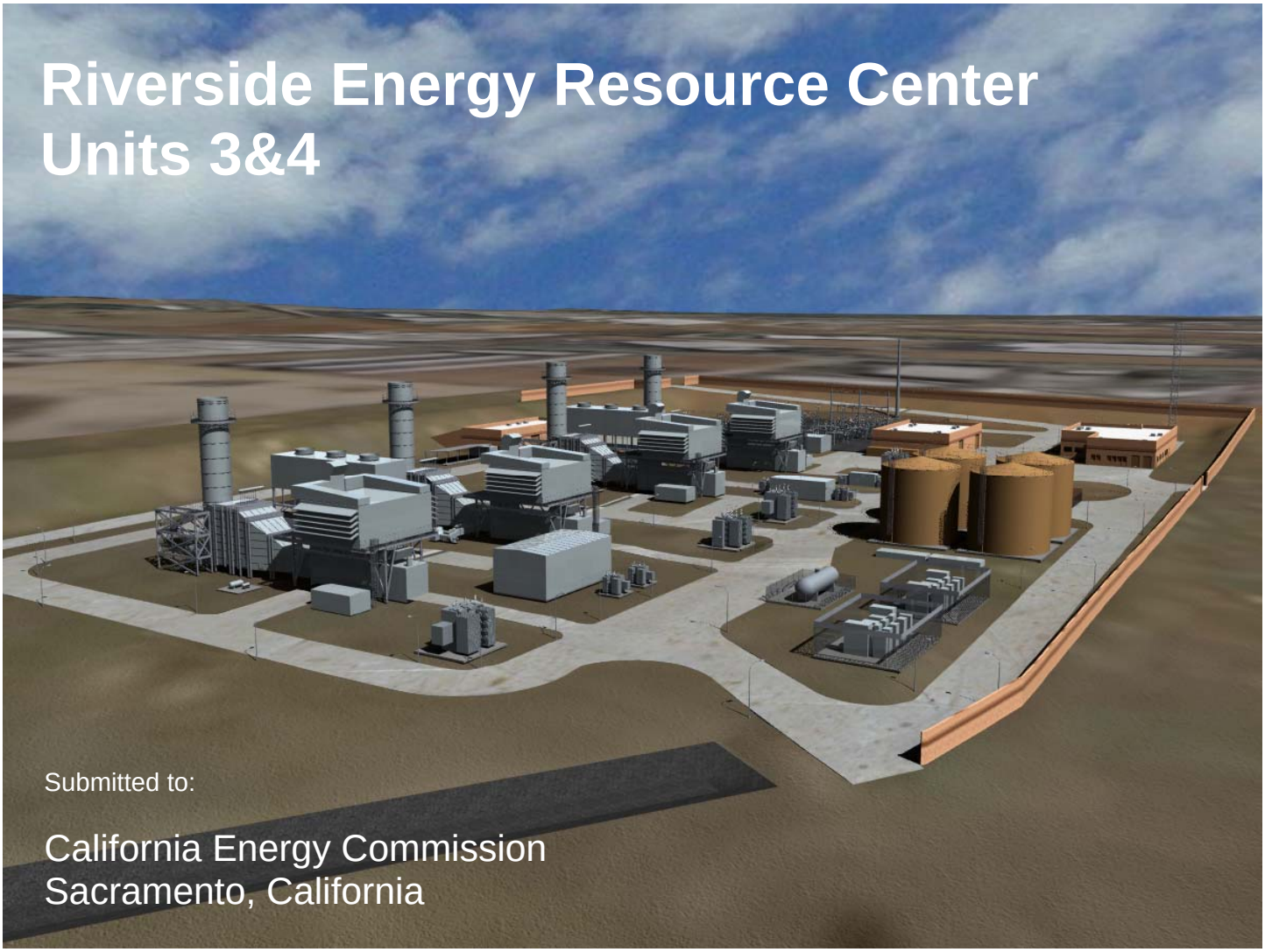
CITY OF RIVERSIDE
PUBLIC UTILITIES

Updated Reponses and Additional Information for the June 26, 2008 Data Response and Issues Resolution Workshop

Riverside Energy Resource Center Units 3&4



Submitted to:

California Energy Commission
Sacramento, California

Submitted by:

City of Riverside Public Utilities

July 3, 2008

Prepared by:

POWER ENGINEERS

TABLE OF CONTENTS
Data Requests, Updated Responses and Additional Information

PAGE

2 & 3

Technical Area: Air Quality
Author: William Walters

Riverside Energy Resource Center Units 3&4
06-SPPE-1

Data Request 2 & 3

BACKGROUND

Existing Unit Actual Emissions

In order to complete its review of the two additional gas turbine units at the RERC site, and adequately determine mitigation requirements, staff needs to understand the actual source tested emissions profile for the existing RERC 1&2. Additionally, in order to properly discuss expected operations, including the expected seasonality of operations and emissions, staff needs information on the actual operating profile of the existing RERC Units 1&2.

DATA REQUEST

2. Please provide a summary of the Continuous Emissions Monitoring System (CEMS) NOx and CO data and source test data for VOC and PM10 for the existing turbines, by year of operation, in the following formats:

    a. Emissions in pounds per hour (normal operation, and startup and shutdown where available).

    b. Emissions in parts per million (ppm) concentration (except PM10).

    c. Emissions per MWh (net generation basis) on an annual basis for 2006 and 2007.

3. Please provide the monthly hours of operation and monthly net generation for RERC 1&2 for 2006 and 2007.

ADDITIONAL INFORMATION

2. A spreadsheet entitled “RERC 3&4 2006-2007 hourly emissions.xls” is electronically attached. This workbook includes individual worksheets for Units 1&2 for the 2006 and 2007 operating years. The hourly data were segregated based upon operating characteristics (normal operations, startup operations, and shutdown operations). Total emissions, average emissions and range of data points are listed for each operating mode (ppmv and lb/hr). The workbook also includes a summary page showing average hourly emission rates for each operating mode. Note that startup emissions are not significantly higher than normal operating hour emissions. This is due to RPU’s typical startup scenario in which the ammonia injection grid is preheated whenever possible. Emissions data supporting the workbook were extracted from the DAS. In some cases invalid data were excluded. Data reflecting only a few minutes of operations in an hour were also excluded if it skewed hourly emission rates downward.

The summary tables below show that average concentrations and hourly mass emission rates are below permit limits and rates assumed for permitting and NSR analysis for all three operating scenarios.

Average Hourly Emissions					
NORMAL OPERATIONS					
		NOX ppmc	**NOX lb/hr**	**CO ppmc**	**CO lb/hr**
2006	**Unit 1**	1.78	3.07	1.07	1.04
	Unit 2	1.64	3.07	1.52	1.62
2007	**Unit 1**	1.92	3.10	1.27	1.14
	Unit 2	1.91	3.23	1.60	1.59

STARTUP OPERATIONS					
		NOX ppmc	**NOX lb/hr**	**CO ppmc**	**CO lb/hr**
2006	**Unit 1**	2.05	5.56	0.91	0.83
	Unit 2	1.54	5.50	1.36	1.13
2007	**Unit 1**	1.68	7.24	1.03	0.90
	Unit 2	1.70	5.51	1.74	1.07

SHUTDOWN OPERATIONS					
		NOX ppmc	**NOX lb/hr**	**CO ppmc**	**CO lb/hr**
2006	**Unit 1**	3.33	2.67	1.38	0.80
	Unit 2	3.03	2.89	1.99	1.25
2007	**Unit 1**	2.02	1.87	1.78	0.77
	Unit 2	2.26	2.12	2.05	1.00

3. A spreadsheet entitled “RERC 3&4 emissions fuel and output summary.xls” is electronically attached. This workbook includes a single spreadsheet showing monthly operating hours, fuel consumption rates and net power output. All data were provided by RPU. Generation values are net of all parasitic loads and all other demand at the RERC facility. Total annual operating hours, fuel consumption and power output are also provided for each turbine and each operating year. For the year 2006, totals for only July through December are reflected. The July start reflects the point where DAS data would be reasonably assumed to be consistently reliable.

   The spreadsheet also shows average emission rates (lb/mw-hr). The averages were calculated by two methods. First, average hourly mass emission rates from the first workbook were compared with average hourly net power generation. Second, total annual emissions from all three operating modes combined were compared with total annual power generation. RPU believes that the first method is likely more reflective of the

actual emissions / power relationship because it excludes startup and shutdown operations. The SCAQMD test report from 2007 also shows the relationship between emissions and power generation.

The summary tables below show the operating hours, fuel consumption and net generation for RERC 1&2 from July 2006 through December 2007.

RERC 1 & 2 Operations Summary 2006

	RERC 1			RERC 2		
	Operating Hours	Fuel Consumption (kscf)	Net Generation (MW)	Operating Hours	Fuel Consumption (kscf)	Net Generation (MW)
Jul-06	221.25	89370	8724.43	181.5	82000	8121.71
Aug-06	99.5	38530	3792.89	133	57170	5696.20
Sep-06	92.75	34780	3374.71	123	53690	5323.15
Oct-06	44.75	16550	1643.43	77	27820	2721.90
Nov-06	29.5	11160	1114.23	25.75	10760	1073.63
Dec-06	4	14260	1430.69	21.5	7860	780.87
Total	**492**	**204650**	**20080.38**	**562**	**239300**	**23717.46**
Average Generation (MW/hr)	40.83			42.22		
Average Normal Operating Hour NOx (lb/hr)*	3.07			3.07		
Average Normal Operating Hour NOx (lb/MW-hr)*	0.08			0.07		
Average Normal Operating Hour CO (lb/hr)*	1.04			1.62		
Average Normal Operating Hour CO (lb/MW-hr)*	0.03			0.04		
Total NOx from startup, shutdown and Normal Operations(lb/yr)**	1702			1911		
Average Total Operating NOx (lb/MW-hr)**	0.08			0.08		
Total CO from startup, shutdown and Normal Operations(lb/yr)**	530			852		
Average Total Operating CO (lb/MW-hr)**	0.03			0.04		

* Average hourly emissions for normal operations Source: 2006-2006 hourly emissions.xls
** Total annual emissions including startup, shutdown and normal operations

Generation is net of all facility consumption
Emission rates may exclude invalid data points

Technical Area: Air Quality
Author: William Walters

RERC 1 & 2 Operations Summary 2007

	RERC 1			RERC 2		
	Operating Hours	Fuel Consumption (kscf)	Net Generation (MW)	Operating Hours	Fuel Consumption (kscf)	Net Generation (MW)
Jan-07	6.25	1505.2	133.77	8.5	1880.5	161.94
Feb-07	20.25	8454.5	866.79	12	4748.9	475.45
Mar-07	2.5	521.1	43.58	21.25	7943.8	794.43
Apr-07	60.75	19581.2	2105.76	107.5	39157.5	4174.97
May-07	40	15171	1507.01	39.5	16214.8	1607.82
Jun-07	119	43892.2	4267.17	55.25	22333.2	2179.36
Jul-07	80	26462.4	2782.87	34	13237.3	1294.31
Aug-07	99.5	38306.8	3703.00	82	36220	3610.13
Sep-07	34.75	11962.5	1147.23	8.25	1979.3	166.24
Oct-07	25.5	10361.3	1047.21	28.5	10438	1022.22
Nov-07	44.75	11651.2	1201.25	46.5	14273.4	1864.94
Dec-07	12.75	3439.2	324.93	2.75	768.6	70.38
Total	**546**	**191308.6**	**19130.58**	**446**	**169195.3**	**17422.20**
Average Generation (MW/hr)	35.04			39.06		
Average Normal Operating Hour NOx (lb/hr)*	3.1			3.23		
Average Normal Operating Hour NOx (lb/MW-hr)	0.09			0.08		
Average Normal Operating Hour CO (lb/hr)*	1.34			1.59		
Average Normal Operating Hour CO (lb/MW-hr)	0.04			0.04		
Total NOx from startup, shutdown and Normal Operations(lb/yr)**	1745			1532		
Average Total Operating NOx (lb/MW-hr)	0.09			0.09		
Total CO from startup, shutdown and Normal Operations(lb/yr)**	577			651		
Average Total Operating CO (lb/MW-hr)	0.03			0.04		

* Average hourly emissions for normal operations Source: 2006-2006 hourly emissions.xls
** Total annual emissions including startup, shutdown and normal operations

Generation is net of all facility consumption
Emission rates may exclude invalid data points

8 & 9

Technical Area: Air Quality
Author: William Walters

Riverside Energy Resource Center Units 3&4
06-SPPE-1

Data Request 8 & 9

BACKGROUND

Greenhouse Gas Emissions

The project is proposing the use of a chiller. Staff needs to know if the working fluid of the chiller is a greenhouse gas (GHG), and needs to know the emission potential from equipment leaks for the chiller working fluid if it is a GHG. Additionally, staff needs to know if electrical equipment will use sulfur hexafluoride (SF_6), which is a very potent GHG. Staff needs this information to ensure an accurate estimate of GHG emissions for the project.

Additionally, staff has found an apparent error in the construction GHG emission estimate. The vehicle methane and nitrous oxide emissions are calculated as if the emission factor basis is kg/mile; however, the correct basis using the cited California Climate Action Registry reference is grams/mile.

DATA REQUEST

8. a. Please identify the chiller working fluid, and if it is a listed GHG, please provide an emission estimate from equipment leaks, such as using the existing site chiller as a basis;

   b. provide a carbon dioxide equivalent GHG emission estimate for the chiller, and

   c. provide revise emission data in grams/mile.

9. a. Please identify if any SF_6 containing equipment will be added as part of the project and provide an emission estimate for SF_6 leaks; and

   b. provide a carbon dioxide equivalent GHG emission estimate for the new SF_6 containing equipment.

ADDITIONAL INFORMATION

8. The table below shows the estimated Annual Refrigerant Leakage Calculation for RERC 3&4.

RERC 3&4 Annual Refrigerant Leakage Calculation

	HCFC123 Mass at Full Charge, lbs *	Leakage Rate, %/year **	Annual Mass HCFC123 leakage, lbs/yr	HCFC123 CO_2 Equivalence (1st year) ***	CO_2 Equivalent Emission, lbs/yr
Chiller A	2,700.0	0.50%	13.50	300.00	4,050.00
Chiller B	2,700.0	0.50%	13.50	300.00	4,050.00
Total	5,400.0		27.00		8,100.00

* Information provided by General Electric
** Provided by Trane, RERC Chiller manufacturer
*** From "International Programme on Chemical Safety, document No 23"

9. Referring to the 2003 EPA study, “SF6 Leak Rates from High Voltage Circuit Breakers - U.S. EPA Investigates Potential Greenhouse Gas Emissions Source” by J. Blackman, *Program Manager, U.S. Environmental Protection Agency,* M. Averyt, *ICF Consulting,* and Z. Taylor, *ICF Consulting.* The expected leak rates can be quantified in a range from 0.2 to 2.5% annually. The larger number is an upper bound worst case scenario as stated by the authors. Likewise the lower leakage rate is a best case unrealistic number. The authors go on to state:

> For the study dataset, the lower and upper bound weighted-average leak rate estimates of 0.2 and 2.5 percent, respectively, represent the best and worst case scenarios for circuit breaker leakage. To put this into some context, NEMA’s SF_6 management guidelines state, “…Over a 50 year service life the emission of SF_6 gas due to its use in electrical equipment will not exceed... 5% equipment leakage…” (i.e., 0.1 percent/year) [7]. Also, the IEC standard for new equipment leakage is 0.5 percent per year [5]. While the upper bound is significantly larger than both the NEMA and IEC guidelines, the lower bound leak rate estimate is comparable, and sits between the NEMA and IEC recommendations.

The table below summarizes the data from the 2003 EPA study.

SF_6 EMISSIONS FROM LEAKING CIRCUIT BREAKERS			
Year Manufactured	**Total Emissions (lbs. SF_6)**	**No. Leaking CBs**	**Total Emissions as % of Nameplate Capacity[a]**
1998	2,859	106	6.0
1999	302	35	0.96
2000	24	7	0.07
2001	140	15	0.29
2002	81	7	0.12
Total	**3,407**	**170**	

Based on the larger IEC leakage guideline rate, the expected leakage from the six RERC Units 3&4 breakers and the CO_2 equivalent of that leakage is:

69 KV BREAKER SF_6 LEAKAGE AND CO_2 EQUIVALENT ESTIMATES					
No. of Breakers	**SF6 Charge, s/breaker ***	**IEC and Mfr Guaranteed Leakage Rate, %/yr**	**Expected Annual Leakage (Six Breakers), lbs**	**CO2 Equivalence Multiplier**	**Equivalent CO2 Emissions, lbs**
6	33	0.50%	0.99	23,900	23,661

61, 62 & 63

Technical Area: Waste Management
Author: Cheryl Closson

Riverside Energy Resource Center Units 3&4
06-SPPE-1

Data Request 61, 62 & 63

BACKGROUND

The project application provides incomplete information on the expected quantities and proposed onsite management practices for both non-hazardous and hazardous wastes generated by the project. For example, Tables 6.14-3 (Non-hazardous Waste Management Methods) and 6.14-4 (Hazardous Waste Management Methods) do not clearly identify which wastes will be generated during construction and which wastes will be generated as part of facility operation. The application is also unclear on how project wastes will be co-managed as part of the existing RERC facility.

Staff requires additional information on the expected waste generation volumes and onsite management practices for both the construction and operation phases of the project. In addition, since the project will be co-located and operated as part of the existing RERC, staff needs clarification on how facility wastes may be co-managed with existing RERC wastes, along with information on the volumes of wastes currently generated by the RERC and the total combined volume of waste expected to be generated by both facilities. This information is necessary to help staff 1) assess project compliance with LORS; 2) evaluate the adequacy of waste management practices and any mitigation measures proposed; and 3) evaluate cumulative impacts from co-operation of the proposed project with the existing RERC.

DATA REQUEST

61. For the construction phase of the project, please provide additional information and revised tables clearly identifying the waste streams, waste volumes and generation frequency, onsite management methods, and offsite recycling or disposal methods proposed for both non-hazardous and hazardous wastes.

62. For the operation phase of the project, please provide additional information and revised tables clearly identifying the waste streams, waste volumes and generation frequency, onsite management methods, and offsite recycling or disposal methods proposed for both non-hazardous and hazardous wastes. Please be sure to clearly delineate and provide information on any waste streams generated by onsite water/wastewater treatment or recycling (such as solids or brine generated from water treatment and oily wastes generated by oil/water separation).

63. Please provide a detailed description of how management of project wastes will be coordinated with the management of existing RERC wastes. Please include information on the types and volumes of hazardous and non-

hazardous wastes currently generated by the existing RERC facility, and how the proposed project's wastes would increase the total volume of waste generated by the RERC or otherwise impact management of wastes by the RERC as a whole.

UPDATED RESPONSE

61. Refer to the attached updated Hazardous Materials section (6.14) of the SPPE Application dated July 1, 2008 (Updated Waste Management Attachment 1).

62. Refer to the attached updated Hazardous Materials section (6.14) of the SPPE Application dated July 1, 2008 (Updated Waste Management Attachment 1).

63. Refer to the attached updated Hazardous Materials section (6.14) of the SPPE Application dated July 1, 2008 (Updated Waste Management Attachment 1).

ADDITIONAL INFORMATION

63. Refer to Additional Waste Management Attachments 2, 3, and 4.

The table below shows the types and volumes of hazardous waste generated by the existing RERC facility (RERC 1&2), as well as the estimated additional volumes of hazardous waste created by RERC 3&4.

RERC 1&2 Actual Approximate Annual Hazardous Waste Generation and Estimated RERC 3&4 Hazardous Waste Generation

			RERC 1&2	**RERC 3&4**
Waste stream	**Haz Mat**	**Generated By:**	**Annual Quantity Generated**	**Estimated Annual Additional Generation**
Turbine Water Wash	Water/soap/oil/ combustion by product	maintenance	2000 gal	2000 gal
Waste oil	lubricating oil	maintenance	200 gal	200 gal
Oil filters	equipment oil filters	maintenance	2 x 55 gallon drum	2 x 55 gallon drum
Gas compressor oil/condensate	lubricating oil	operational byproduct	150 gal	150 gal
Oil rags and absorbent	lubricating oil	maintenance and housekeeping	55 gallon drum	55 gallon drum
oily rock and dirt	lubricating oil	housekeeping	55 gallon drum	55 gallon drum
disposable batteries	dry cell acid batteries	battery operated devices	10 lbs	0
Oil from plant drains	lubricating oil	oil water separator	175 gallons	200 gallons
toner cartridges	copier/ printer toner	copier and printers	12 cartridges	0

Note: for non-liquid haz waste we use receptacles provided by City approved haz waste hauler. For items 2,3,4 and 5 we use 55 gallon drums. For item 3,4 and 5 we use removable lid 55 gallon drum.
Note: Items 4 and 8 have individual accumulation tanks attached to the process for containing waste oil. Waste oil is pump out of individual tank using City approved vacuum truck and hazardous waste hauler.
Note: Item 1 has individual accumulation tank attached to the process for containing soapy wash byproduct. Soap/water/oil mixture is pumped out of individual tank using City approved vacuum truck and hazardous waste hauler.
Note: Waste hauler is City approved. Manifest are used to track waste removed. EPA ID number for RERC 1&2 is CAL000305521.
Note: RERC 1&2 actual quantity generated calculated from average quarterly disposal over a two year period.

6.14 Hazardous Materials

6.14.1 Introduction

Riverside Public Utilities (RPU) proposes to build, own, and operate a nominal 95-megawatt (MW) simple-cycle power plant on 2.2 acres of a 16-acre fenced site within the City of Riverside, California. This proposed facility is referred to as the Riverside Energy Resource Center Units 3&4 (RERC 3&4 or Project). RERC 3&4 will supply the needs of the City of Riverside primarily during summer peak electrical demands as well as supporting the City's minimum emergency loads in the event RPU is islanded from the external transmission system. No power from the Project will be exported outside of the City.

This section describes the hazardous materials and waste generation management program that would be used during construction and operation of the project. The discussion includes information on the relevant laws, ordinances, regulations, and standards (LORS) that would be applicable given the nature of substances that will be used and wastes that may be generated at the proposed facility. Finally, an analysis of potential environmental and health impacts associated with hazardous materials and wastes is provided.

6.14.1.1 Project Description

The proposed site is owned by the City of Riverside and is located adjacent to the Riverside Energy Resource Center Units 1&2 (RERC 1&2) site, on the north side of Jurupa Avenue, fronting on Payton Avenue. The Project is located in a light industrial/manufacturing area, east of the RRWQCP and immediately north of RERC Units 1&2. The Project will consist of two additional aero-derivative combustion turbine generators with Emission Control Modules (ECM) and a common mechanical chiller for inlet air cooling, an on-site switchyard (two new bays), and on-site ancillary buildings.

RERC Units 3&4 will occupy approximately 2.2 acres, with an additional area of 2 acres set aside for construction laydown. The entire 16 acre plant perimeter (project area) is fenced with a combination of chain-link fencing and architectural block walls, with landscaping installed per City of Riverside standards. Notable features within 1 mile of the proposed Project site include residential areas, an elementary school, and the Riverside Municipal Airport. A complete description of area land uses is provided in Section 6.2.

The operation of Units 1&2 and construction of Units 3&4 will largely be separate operations up until initial commissioning and operation of Units 3&4 commences. Until that time, the constructor will be responsible for managing construction wastes. Construction and operational wastes will not be mixed with separate disposal containers, bins, dumpers, haulers, etc. being used.

RPU will retain responsibility for all operational wastes from Units 1&2. Once initial commissioning and operation commences on Units 3&4, RPU will assume operational control and the resulting operational wastes will be dealt with using the existing procedures and processes for Unit 1&2. Construction wastes will remain the

responsibility of the constructor through site cleanup and turnover to RPU.

Various chemicals will be stored and used during the construction and operation of the proposed Project. All chemicals will be stored in appropriate storage facilities. Bulk materials will be stored in tanks or containers made of materials compatible with the intended contents. Quantities generally less than 55 gallons will be stored in delivery containers. All hazardous material storage and use areas will be designed to contain leaks and spills. Containment structures will be provided with sufficient volume to contain the spill of a full tank without overflow. All chemicals on-site will be stored, handled, and used in accordance with applicable laws, ordinances, regulations, and standards (LORS).

All equipment containing significant quantities of oil (transformers, CTGs) will be provided with their own secondary containments. Containments will be sized to contain 110 percent of the nominal capacity plus an allowance for precipitation from a 25-year, 24-hour event and fire water. The secondary containments will be provided with drains with normally closed valves that allow for removal of clean rainwater.

Aqueous ammonia is the hazardous material that will be present in the greatest quantity and presents the largest degree of risk of spills or releases. The existing 12,000-gallon aqueous ammonia storage tank installed as part of RERC 1&2 will also be used for RERC 3&4. Thus with RERC 3&4 there is no increase in the amount of aqueous ammonia stored on site.

To mitigate the risk associated with storing large quantities of aqueous ammonia, the storage tank facility includes a secondary containment capable of holding 110 percent of the nominal 12,000-gallon tank capacity. Additional capacity was provided to hold precipitation from a 25-year, 24-hour event. The ammonia tank is equipped with a pressure relief valve, a vapor equalization, vent, and vacuum breaker. The ammonia delivery truck unloading station includes a curbed area that can contain the truck volume and prevent storm water runoff from entering the unloading area. The curbed truck drainage pad slopes toward a collection sump. The catch basin is drained periodically to remove any accumulation of spills and rain water.

Small-quantity chemicals will be stored in their original delivery containers to minimize risk of upset. All hazardous materials storage vessels will be designed in conformance with the applicable local, state, and federal LORS. All electric equipment will be specified to be free of polychlorinated biphenyls (PCBs).

Safety showers and eyewash stations will be provided in all chemical storage areas. Service water hose connections will be provided near the chemical storage areas to facilitate flushing of leaks and spills of non-water reactive materials. Appropriate safety gear will be provided for plant personnel for use during the handling, use, and cleanup of hazardous materials. Plant personnel will be properly trained in the handling, use and cleanup of hazardous materials used at the plant, and in procedures to follow in the event of a leak or spill. Adequate supplies of appropriate cleanup materials will be stored on-site. The RERC Hazardous Materials Business Plan that was prepared in compliance with

the California Hazardous Materials Release Response Plans and Inventory Act for RERC 1&2 will be updated to reflect RERC 3&4 and submitted to the City of Riverside Fire Department for approval.

Process waste water streams that are subject to oil contamination will be contained and processed through an Oily Water Separator (OWS). Oil that accumulates in the OWS will be transported off-site for disposal.

Personal protective equipment (PPE) will be provided for plant personnel use. Personnel working with chemicals will be trained in proper handling techniques and in emergency response procedures to chemical spills or accidental releases.
Appropriate safety programs will be updated and will address hazardous materials storage locations, emergency response procedures, employee training requirements, hazard recognition, fire safety, first-aid/emergency medical procedures, and hazardous materials release containment/control procedures, hazard communications training, PPE training, and release reporting requirements. These programs include a chemical Risk Management Plan (RMP) for aqueous ammonia, sulfuric acid, and sodium hydroxide in accordance with the California Accidental Release Prevention Program (CalARP) emergency regulations, Hazardous Materials Business Plan, workers safety program, fire response program, a plant safety program, and the facility's standard operating procedures.

Spent SCR and oxidation catalyst will be recycled by the catalyst supplier. Used oil filters will be recycled or disposed of at an offsite disposal facility. Used oil will be recovered and recycled by a waste oil-recycling contractor.

Chemical cleaning wastes consist of acid and alkaline cleaning solutions used for pre-operational chemical cleaning of piping. These wastes, which may have elevated concentrations of metals, will be tested. If hazardous, these and all other hazardous solid and liquid wastes will be disposed of in accordance with applicable LORS.

Workers will be trained to handle waste generated at the site in accordance with federal and state worker safety and health regulations.

6.14.2 Setting

6.14.2.1 Laws, Ordinances, Regulations and Standards

The use and storage of hazardous materials and the generation of hazardous wastes are regulated by federal, state, and local laws, ordinances, regulations and standards (LORS).

Table 6.14-1 provides a summary of the LORS that are applicable to the proposed project.

Table 6.14-1 Laws, Ordinances, Regulations and Standards

FEDERAL	APPLICABILITY
Clean Water Act Oil Pollution Prevention Act (OPPA)	Requires implementation of a Spill Prevention Control & Countermeasures (SPCC) Plan for fuel storage facilities (including

40 CFR Part 112	temporary facilities) if the quantity stored is greater than 1,320 gallons and if a spill could reasonably be expected to enter navigable waters of the United States or affect natural resources under the jurisdiction and management of the United States.
Clean Air Act (CAA) Chemical Accident Prevention Provisions 40 CFR Part 68	Requires a Risk Management Plan (RMP) if listed hazardous materials are stored at or above the designated Threshold Quantity (TQ).
Comprehensive Environmental Response, Compensation, and Liability Act (CERLA)/Superfund Amendment and Reauthorization Act - Emergency Planning and Community Right-to-Know Act (EPCRA) Section 302 40 CFR Part 300/355	Requires certain planning activities when Extremely Hazardous Substances (EHS) are present in excess of their Threshold Planning Quantity (TPQ). Facilities must comply within 60 days of becoming subject to these regulations. (Note: Requirement met by complying with State of California Hazardous Materials Release Response Plans and Inventory Act).
CERCLA/SARA EPCRA Section 304 40 CFR Part 300/355	Requires notification when there is a release of a hazardous material in excess of its reportable quantity (RQ).
CERCLA/SARA EPCRA Section 311/312 40 CFR Part 300/355	Requires a Material Safety Data Sheet (MSDS) for every hazardous material to be kept on-site and submitted to the State Emergency Response Commission (SERC), Local Emergency Planning Committee (LEPC), and the local fire department. Requires annual inventory reporting. (Note: Requirement met by utilizing forms also required under the State of California Hazardous Materials Release Response Plans and Inventory Act).
CERCLA/SARA EPCRA Section 313 Toxic Release Inventory (TRI) 40 CFR Part 300/355	Requires annual reporting of releases of hazardous materials.
Resource Conservation and Recovery Act (RCRA) Subtitle C	Regulates storage, treatment, and disposal of hazardous waste.
Hazardous Materials Transportation Act 49 CFR Part 100 – 185	Regulates the transportation of hazardous materials. Requires employee training and proper transportation methods for hazardous materials as defined in 40 CFR Part 172.

STATE	**APPLICABILITY**
Hazardous Materials Release Response Plans and Requires preparation of a Hazardous Materials Inventory Act (Health and Safety Code, Chapter Business Plan (HMBP) including a hazardous 6.95 Section 25500 - 25545)	Requires preparation of a Hazardous Materials Business Plan (HMBP) including a hazardous materials inventory if hazardous materials are handled and stored in excess of 55 gallons, 500 pounds, or 200 cubic feet of gas at standard temperature and pressure or equal to or greater than the federal TPQ for federally-listed Extremely Hazardous Substances. Inventory report forms also meet federal EPCRA Section 312 requirements.
California Accidental Release Prevention (CalARP) Program (Health and Safety Code, Chapter 6.95, Section 25531 – 25543.4	Requires registration with local Certified Unified Program Agency (CUPA) or lead agency and preparation of a Release Management Plan (RMP) if acutely hazardous materials are handled or stored in excess of TPQs. This program is the adopted federal CAA Chemical Accident Prevention program (40 CFR part 68) with some amendments specific to the state.

Aboveground Petroleum Storage Act (Health and Safety Code, Chapter 6.67, Sections 25270 – 25270.13)	Requires entities that store petroleum in aboveground storage tanks (AST) in excess of certain quantities to prepare an SPCC plan.
California Hazardous Waste Control Law (Health and Safety Code, Chapter 6.5, Section 25100-25249; regulations found at 22 CCR Section 66261.126 et.seq.)	Controls Storage, treatment, and disposal of hazardous waste.
California Hazardous Waste Control Law, Management of Used Oil (Health and Safety Code, Chapter 6.5, Section 25250 – 25250.28	Regulates the disposition of used oil transported offsite for recycling. Does not apply to oil removed from electrical equipment.
Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et.seq.; waste discharge regulations found in CWC Sections 13260 – 13274)	Controls discharge of wastewater to the surface and groundwaters of California. Applies only if the facility discharges wastewater to surface or groundwater.
LOCAL	**APPLICABILITY**
Ordinance No. 615.3 Relating to establishments where hazardous waste is generated, stored, handled, disposed, treated, or recycled.	Requires initial notification reporting to the County of Riverside Health Services Agency Department of Health and a permit for facilities that generate hazardous waste.
Ordinance No. 651.3 Disclosure of hazardous materials and the formulation of Business Emergency Plans	Permit required for handling hazardous materials from the Department of Health. Applicants must develop a Business Emergency Plan. Businesses that the DEH determines present a significant risk under the state or federal regulations shall prepare a Risk Management Plan.
Ordinance No. 617.4 Regulation of underground tank systems containing systems for hazardous substances.	Requires a permit for underground storage tank systems for hazardous substances

Other Federal and State Regulations

Toxic Release Inventory

The EPA has established the Toxics Release Inventory (TRI), a publicly available database that contains information on toxic chemical releases and other waste management activities of chemicals reported annually by certain industry groups, including federal facilities.

California Environmental Protection Agency

The California EPA (Cal/EPA) has broad jurisdiction over hazardous materials management in the State. Within Cal/EPA, the Department of Toxic Substances Control (DTSC) has primary regulatory responsibility for hazardous waste management and cleanup. Enforcement of regulations has been delegated to local jurisdictions that enter into agreements with DSTC for the generation, transport, and disposal of hazardous materials under the authority of the Hazardous Waste Control Law.

Department of Toxic Substance Control

Resource Conservation and Recovery Act (RCRA) of 1976 is the principal Federal Law that regulates the generation, management, and transportation of hazardous materials and other wastes.

The DTSC regulates hazardous waste in California primarily under the authority of the Federal RCRA, and the California Health and Safety Code. Other laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reductions, cleanup, and emergency planning. From these laws, DTSC's major program areas develop regulations and consistent program policies and procedures. The regulations spell out what those who handle hazardous waste must do to comply with the laws. Under RCRA, DTSC has the authority to implement permitting, inspection, compliance, and corrective action programs to ensure that people who manage hazardous waste follow state and federal requirements.

California law provides the general framework for regulations of hazardous wastes by the Hazardous Waste Control Law (HWCL) passed in 1972. DTSC is the State's lead agency in implementing the HWCL provides for State regulation of existing hazardous waste facilities, which include "any structure, other appurtenances, and improvements on the land, used for treatment, transfer, storage, resource, recovery, disposal, or recycling of hazardous waste," and requires permits for, and inspections of facilities involved in generation and/or treatment, storage and disposal of hazardous wastes.

Tanner Act

Although there are numerous State policies dealing with hazardous waste materials, the most comprehensive is the Tanner Act (AB 2948) that was adopted in 1986. The Tanner Act governs the preparation of hazardous waste management plans and the siting of hazardous waste facilities in the State of California. The act also mandates that each county adopt a Hazardous Waste Management Plan.

Hazardous Materials Management Plans

In January 1996, Cal EPA adopted regulations implementing a "Unified Hazardous Waste and Hazardous Materials Management Regulatory Program" (Unified Program The program is implemented at the local level by a local agency-the Certified Unified Program Agency (CUPA). The CUPA is responsible for consolidating the administration of the six program elements within its jurisdiction.

California Accidental Release Prevention Program (CalARP)

The CalARP program (CCR Title 19, Division 2, Chapter 4.5) covers certain businesses that score or handle more than a certain volume of specific regulated substances at their facilities. The CalARP program regulations became effective on January 1, 1997, and include the provisions of the Federal Accidental Release Prevention program (Title 40, CRF Part 68) with certain additions specific to the State pursuant to Article 2, Chapter 6.95, of the Health and Safety Code.

Worker and Workplace Hazardous Materials Safety

Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the workplace. The California Division of Occupational Safety and Health (Cal/OSHA) is responsible for developing and enforcing workplace safety standards and assuring worker safety in the handling and use of hazardous materials. Among other requirements, Cal/OSHA obligates many businesses to prepare Injury and Illness Prevention Plans and Chemical Hygiene Plans. The Hazard Communication Standard requires that workers be informed of the hazards associated with the materials they handle.

Hazardous Materials Transportation

The California Highway Patrol (CHP) and California Department of Transportation (Caltrans) are the enforcement agencies for hazardous materials transportation regulations. Transporters of hazardous materials and waste are responsible for complying with all applicable packaging, labeling, and shipping regulations. The Office of Emergency Services (OES) also provides emergency response services involving hazardous material incidents.

Riverside County Hazardous Waste Management Plan

The Riverside County Hazardous Waste Management Plan (HWMP) identifies current and projected future hazardous waste generation and management needs throughout the County. The HWMP provides a framework for the development of facilities to manage hazardous wastes, i.e. facility siting criteria. The HWMP also includes a Households Hazardous Waste Element that is designed to divert household hazardous wastes from the County's landfills.

Riverside City 2025 Public Safety Element

According to the City of Riverside 2025 General Plan, hazardous material is any material that because of its quality, concentration or physical or chemical characteristics, poses a significant potential hazard to human health or safety or to the environment. Hazardous materials are used in the City of Riverside for a variety of purposes. The most common large users include manufacturers, medical clinics, agriculture, dry cleaners, pest controllers, film processors and automotive related business.

Large users and transporters of hazardous materials are monitored and regulated by the Federal Environmental Protection Agency (EPA) and other Federal, State and County regulatory agencies, such as the State Department of Toxic Substance Control and the Riverside Fire Department.

The current regulatory environment provides a high level of protection from the hazardous materials manufactured within, transported to and stored in Riverside's industrial and educational facilities. By recognizing these hazards and ensuring that an educated public can work with City officials to minimize risks associated with hazardous materials in the urban environment, Riverside can maintain safe conditions citywide. The following objectives and policies were established in the Public Safety Element in order to minimize hazardous materials exposures.

Objective PS-3: Minimize risks associated with the storage transport and disposal of Hazardous materials.

Policy PS-3.1: Ensure that hazardous materials used in business and industries are handled properly.

Policy PS-3.2: Provide the Fire Department with resources to ensure that hazardous materials are used and generated by businesses handled properly.

Policy PS-3.3: Work with responsible Federal, State and County agencies to identify and regulate the disposal of toxic materials.

Policy PS-3.4: Reduce the risks associated with ground transportation hazards, where feasible.

Policy PS-3.5: Encourage sewer service to minimize groundwater contamination.

The Project is being designed to comply with the above policies and objectives set forth in the 2025 General Plan's Public Safety Element.

6.14.3 Hazardous Materials Management

Hazardous materials that will be used and stored during construction and operation of the Project are shown on Table 6.14-2. Only aqueous ammonia and sodium hypochlorite will be present in amounts greater than the federal and state regulated reportable quantities.

Table 6.14-2 Hazardous Materials – RERC Units 3&4

Material Name	Chemical Composition	Use	Quantity	Federal Reportable Quantity	Storage Location
Aqueous ammonia (19 percent solution)	Ammonium hydroxide	Control nitrous oxide (NOx) emissions through selective catalytic reduction (SCR)	12,000 gal. (approx. 90,000 lbs.)	1,000 pounds (ammonium hydroxide)	South of the gas Compressors and central to the plant
Cleaning chemicals/ detergents	Various	Periodic cleaning	10 gal.	*	Administration/ Control Building and Warehouse
Laboratory reagents (liquid)	Various	Water/wastewater laboratory analysis	10 gal.	*	Warehouse
Laboratory reagents (solid)	Various	Laboratory analysis	50 lb.	*	Warehouse

Mineral Oil lubrication oil	Oil	Lubricate gas compressor and bearings	15 gal.	None	Contained within equipment and extra oil stored in waste oil storage enclosure.
Synthetic lubrication oil	Oil	Lubricate rotating equipment (e.g., combustion turbine bearings)	200 gal.	None	Contained within equipment and extra oil stored in the waste oil storage enclosure.
Mineral lubrication Oil	Oil	Lubricate rotating equipment (e.g., generator bearings)	782 gal.	None	Contained within equipment, extra stored in waste oil storage enclosure.
Mineral insulating Oil	Oil	Transformers	10,600 gal.	None	Contained within GSU and auxiliary transformers
Scale/corrosion inhibitor (NALCO 2833)	Acrylate Polymer 14% Sodium Molybdate 5% Sodium Nitrate 30% Sodium Hydroxide 1% Water 50%	Cooling tower closed loop scale/corrosion Inhibitor	75 gal.	None	Near cooling tower
Starbrex ST 70Hypochlorite	Sodium Hypochlorite 6.36% Sodium Bromine 9.23% Inert 84.41%	cooling tower	100 gallons, 800+ lbs	100 lbs.	Near cooling tower
3D Trasar (3DT194)	Sulphuric Acid 4% Aromatic Amine 16% Inert 80%	Cooling tower water pH control	75 Gallons, 600+ lbs	1,000 lbs.	Near cooling tower
3D Trasar (3DT186)	Phosphoric Acid LMI 40% Phosphate (inert) 60%	Corrosion & Scale Control pH Adjustment	55 gallons, 450+ lbs	5,000 lbs.	Near cooling tower
Miscellaneous flammable liquids	Gasoline, paint, solvents, etc.	Fuel for on site landscaping equipment, paint and solvents for equipment painting	20 gal.	*	Flammable Storage enclosure

RQ depends on chemical constituents, which will be determined as needed.

6.14.4 Waste Generation

6.14.4.1 Solid Non-Hazardous Waste

The construction, operation, and maintenance of the Project will generate non-hazardous solid wastes typical of power generation facilities.

Wastes generated during construction generally include soil, scrap wood, excess concrete, empty containers, scrap metal, and insulation. These materials will be collected for recycling or transfer to landfills in accordance with applicable regulatory requirements.

Typical wastes generated during operation and maintenance includes scrap metal and plastic, insulation material, paper, glass, empty containers and other miscellaneous solid wastes, and waste turbine wash water. These materials will be collected for recycling or

transfer to landfills in accordance with applicable regulatory requirements.

A list of non-hazardous wastes, estimated waste quantities, disposal frequency, and disposal methods is provided in Tables 6.14-3 and 6.14-4.

Table 6.14-3 RERC Units 3&4 Non-hazardous Construction Waste Management Methods

Source of Waste	Waste Composition	Quantity and Frequency	Disposal Method
Construction waste	Wood, metal, concrete, etc.	10.0 cubic yards per month	Recycled or transported to offsite landfill as appropriate.
Municipal Solid Waste	Paper, food, plastic, etc.	5.0 cubic yards per month	Recycled or transported to offsite landfill as appropriate.

Table 6.14-4 RERC Units 3&4 Non-hazardous Operation Waste Management Methods

Source of Waste	Waste Composition	Quantity and Frequency	Disposal Method
Closed Cooling (chilled Water) Systems	Propylene glycol	55 gal/year, typically once per year as part of annual maintenance.	Pumped from closed loop cooling system to 55-gal drums and sent offsite for recycling.
Municipal Solid Waste	Paper, food, plastic, etc.	5.0 cubic yards per month.	Recycled or transported to offsite landfill as appropriate,
Wastewater System	Process drains, miscellaneous floor drains	50 gpm [peak flow], Oils and other material trapped in the Oily Water Separator are shipped off site, for proper disposal typically 2 times a year.	Waste water is directed to the Oily Water Separator. Clean water from the Oily Water Separator is recycled back to the Raw Water Storage Tank.

6.14.4.2 Hazardous Waste

Hazardous wastes will be generated as a result of Project construction, operation, and maintenance. The majority of hazardous wastes generated during construction will be liquid wastes such as waste oil and other lubricants from machinery operations, solvents used for cleaning and materials preparation, waste paints, and other material coatings.

Table 6.14-5 provides a list of the expected construction hazardous wastes that may be generated at RERC and the disposal methods that will be utilized.

Table 6.14-5 RERC Units 3&4 Construction Hazardous Waste Management Methods

Source of Waste	Waste Composition	Quantity and Frequency	Disposal Method
Lubricating Oils	Waste oil	300 gallons over the course of construction due to power plant equipment flushes and to service construction equipment	Pumped to service trucks and then taken offsite for recycling
Surface preparation and cleaning operations	Used solvents	Approximately 50 gallons over the course of construction	Transported off-site for disposal as a hazardous waste
Painting	Paint	Approximately 100 gallons over the course of construction	Excess used on other projects to the extent possible, remainder transported off-site for disposal as a hazardous waste

Table 6.14-6 provides a list of the expected operational hazardous wastes that may be generated at RERC and the disposal methods that will be utilized.

Table 6.14-6 RERC Unit s 3&4 Operational Hazardous Waste Management Methods

Source of Waste	Waste Composition	Quantity and Frequency	Disposal Method
Chemical Feed and Sampling Systems	No waste routinely generated; occasional spills only	No waste routinely generated *	Spills pumped from secondary containment into container and reclaimed or disposed of offsite at appropriately permitted facility (RCRA Part B)

Emissions Control Module	Spent SCR and Oxidation Catalyst	One SCR and one CO catalyst assembly per unit, typically replaced after 25,000 hours of operation	Recycled by supplier
Electrical Transformers	Waste oil	No waste routinely generated *	Pumped from transformer to 55-gallon drum, stored in Waste Oil Storage enclosure until sent offsite for recycling.
Lubricating Oils	Waste oil	No waste routinely generated *	Pumped from equipment to 55-gallon drum, stored in Waste Oil Storage enclosure until sent offsite for recycling
Combustion Turbine Generator	Turbine Water Wash	Approximately 1,000 gallons per year	Transported off-site for disposal as a hazardous waste
Fuel Gas System	Blowdown oils	30 gal/month	Blowdown from filters flows to drain tanks and the contents from the drain tanks will be pumped into 55-gal drums and sent for recycling

* Waste generation would be associated with non-routine events such as equipment breakdown and accidental spills.

The methods used to properly collect and dispose or recycle hazardous wastes generated by the plant depend on the nature of the waste.

Hazardous wastes generated by the plant during operation will include spent SCR and oxidation catalyst, used oil filters, used oil, and chemical cleaning wastes.

6.14.4.3 General Plant Drainage

General plant drainage consists of wastewater collected by sample drains, equipment drains, equipment leakage, and area wash-downs. Waste water collected in the general plant drainage system will be routed to the Oily Water Separator. Clean water exiting the Oily Water Separator is recycled back to the Raw Water Storage Tank. Chemicals for treatment of the cooling tower water will be stored in a secondary containment with no direct drainage to the sewer system. Combustion turbine water wash effluent is routed to a

holding tank for off-site disposal as a hazardous waste.

6.14.5 Impacts

6.14.5.1 CEQA Environmental Checklist

Table 6.14-5 shows the results of the CEQA Environmental Checklist.

Table 6.14-5 CEQA Environmental Checklist – Hazardous Materials

	Potentially Significant Impact	**Less than Significant with Mitigation Incorporated**	**Less than Significant Impact**	**No Impact**
HAZARDS AND HAZARDOUS MATERIALS – *Would the project:*				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X	
b) 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?			X	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
HAZARDS AND HAZARDOUS MATERIALS – *Would the project:*				
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?			X	
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				X
i) Exceed an applicable LRDP or Program EIR standard of significance?				X

6.14.5.2 Discussion of Impacts

The proposed Project will have a less-than-significant impact on the public or the environment through the routine transport and use of hazardous materials. The proposed Project would be a peaking power plant that operates infrequently. Thus, the Project would not produce a continuous stream of hazardous or other waste materials. These wastes produced are common and are routinely transported in a safe manner. Transport of hazardous materials will comply with all applicable federal Department of Transportation laws and other applicable LORS to minimize the potential for a transportation-related release.

On-site Chemical Management Impacts

The principal regulated hazardous substance that will be present in a quantity exceeding state and federal threshold planning limits is 19 percent aqueous ammonia. This solution will be used in the ECM to control NO_X emissions. 19 percent aqueous ammonia (ammonium hydroxide) is a corrosive that can cause irritation to the respiratory tract, skin, and eyes.

The existing aqueous ammonia storage facility, which currently serves RERC 1&2 and will also serve RERC 3&4, is located at the north west end of the RERC site. It is ventilated to prevent accumulation of emissions from exceeding OSHA permissible exposure limits. This area is designed to hold the nominal capacity of the 12,000 gallon ammonia tank plus 10 percent freeboard capacity to accommodate precipitation from a 25-year 24-hour event. The associated piping systems are made of appropriate materials and contain safety features that reduce the potential for ammonia releases at the site. Because of safety shut-off systems associated with delivery of aqueous ammonia from the tank to the vaporizer and ammonia to the ECM, potential ammonia release quantities from these system components in the event of an upset condition are very small.

RERC 3&4 will use approximately 198 pounds per hour of 19 percent aqueous ammonia solution. It is anticipated that ammonia will be delivered approximately 10 times per year for all four units. This will not pose a substantial increase in risk of releases from use or transport of this substance.

Table 6.14-6 presents the anticipated frequency of hazardous materials deliveries to RERC.

Table 6.14-6 Anticipated Frequency of Hazardous Materials Deliveries to RERC

Hazardous Material	Frequency of Deliveries	Quantity per Load	Transport Method
19% Aqueous Ammonia	4 times/year	8,000 gal.	Tank truck
Sodium Hypochlorite	Quarterly	300 gal.	Tank truck
Anti-scalant Inhibitor (NALCO 73209)	Quarterly	75 gal.	Delivery vehicle
Biocide	Quarterly	50 gal.	Delivery vehicle
Anti-scalant (NALCO PT-191)	Quarterly	75 gal.	Delivery vehicle
Bisulfite (NALCO 7408)	Quarterly	75 gal.	Delivery vehicle
Sulfuric Acid	Quarterly	50 gallons	Tank truck
Laboratory Chemicals	Quarterly	2 gallons	US Mail/Courier

Sulfuric acid will be used at the facility for maintaining pH in the tower. The amount stored on-site (50 gallons) will not exceed state and federal threshold planning quantities. Sulfuric acid is a clear, oily liquid that is very corrosive. The primary exposure routes are either by direct contact in the event of spills or through inhalation of airborne vapors. The Occupational Safety and Health Administration (OSHA) and the National Institute of Occupational Safety and Health (NIOSH) limit the amount of sulfuric acid in workroom air to 1 milligram per cubic meter of air (1 mg/m3) [Agency for Toxic Substances and Disease Registry, 1998]. Sulfuric acid will be stored near the cooling towers of each unit. Extra inventory will be stored in the existing chemical storage enclosure area in containers compatible with strong acids.

The Project will use less than one gallon of 93 percent sulfuric acid solution per day. It is anticipated that sulfuric acid will be delivered four times per year. This will not pose a substantial increase in risk of releases from use or transport of this substance.

Sodium hypochlorite is synonymous with liquid bleach. It is prepared by reacting a dilute caustic soda solution with liquid or gaseous chlorine accompanied by cooling. This compound will be used for sanitization in the cooling tower and reverse osmosis system. Sodium hypochlorite is a powerful oxidizing agent that can produce burns when in contact with the skin and respiratory irritation or burns when inhaled.

The project will use approximately 5 gallons of sodium hypochlorite per day. It will be shipped to the site approximately four times a year and stored near the cooling tower and demin plant. With appropriate management, use of this chemical in low quantities will not pose a substantial risk of releases. The chemical storage enclosure, ammonia storage tanks, and other equipment that may contain hazardous substances will be designed to provide secondary containment and/or other means to control the spread of any spills or releases that may occur and to isolate such substances from incompatible materials or processes.

On-site Waste Management Impacts

Methods that will be used to handle waste generated by the proposed Project are summarized in Tables 6.14-3 and 6.14-4, above. In addition to those wastes generated during operation of the proposed Project, construction wastes that may be generated temporarily could also include small quantities of adhesives, solvents, and paints, and other solid construction debris. The construction contractors will save unused chemicals for reuse. Any chemical waste products generated by the contractors will be transported offsite by a licensed hazardous waste transporter to an approved disposal facility. Therefore, the impacts from waste management at the proposed Project site are expected to be minimal.

Sensitive Receptors

Sensitive receptors are usually thought of as vulnerable populations or ecosystems that could be impacted by the release of toxic materials or hazardous wastes. Such populations typically include daycare facilities, residential facilities such as schools, and parks, and other locations typically occupied by children. Hospitals and nursing homes are also considered sensitive receptors. Sensitive ecosystems may include wetlands, rivers, ponds, and natural landscapes that serve as feeding and brooding sites for animal populations. The Santa Ana River Corridor, north of the proposed facility, is frequented by humans and wildlife and is considered a sensitive area. In addition, residentially zoned land is located approximately 0.5 miles to the south. However, the area immediately surrounding the proposed facility is dedicated for commercial and industrial use and does not encompass any sensitive receptors. The previously identified dog kennel is located approximately 500 feet southeast of the Project. Adjoining properties include storage yards, commercial businesses, and the City of Riverside RRWQCP. Access is by commercially traveled roads utilized by other industries to haul raw materials or component ingredients similar to those that would be used by the proposed project.

Given the infrequent deliveries of hazardous materials or removal of wastes, the small quantities associated with these deliveries, and the routes that would be used by commercial haulers (which is away from the river's open space corridor), the risk to this area is considered minimal. Detailed discussion of the health and safety considerations for this project is found in Section 6.8.

Cumulative Impacts

As proposed, the Project will not result in significant cumulative impacts that could adversely affect public health and safety or the environment. The primary potential cumulative effect would require consideration of the possibility any one chemical release from the site would create an additive risk to humans or the environment when combined with other releases or emissions emanating from surrounding chemical-use facilities. An even less likely scenario would be that two or more hazardous substances would be released at the same time and therefore have the potential to combine, thereby posing a greater threat to offsite receptors. The hazardous material with the greatest potential for offsite migration would be the 19 percent aqueous ammonia solution. A health risk analysis for exposure to aqueous ammonia is included in Section 6.8. Spills or leaks of aqueous ammonia would gradually evaporate as a gas to the atmosphere. At high concentrations (greater than 2,500

parts per million [ppm]), ammonia gas causes severe health impacts. However, the odor threshold is approximately 5 ppm and irritation of the upper airways occurs at concentrations between 30 and 50 ppm. Therefore, any releases would be readily detectable at concentrations well below severe hazard levels. Safety precautions designed to quickly mitigate potential releases and safeguard worker health will include equipping workers with appropriate personal protective equipment, conducting appropriate hazardous materials and emergency response training, appropriate storage and signage practices, and worker right-to know/chemical awareness training.

6.14.6 Involved Agencies and Agency Contacts

Local agencies involved in hazardous materials management at the Proposed facility and a contact person at each agency. The Riverside County Community Health Agency, Department of Environmental Health is the CUPA and administers the Hazardous Waste Generator Program and the Hazardous Materials Handler Program. The County of Riverside and the City of Riverside oversee compliance with the California Accidental Release Prevention Program (CalARP) and the Hazardous Materials Release Response Plan and Inventory Act (i.e., the Hazardous Materials Business Plan program). The HMBP needs to be submitted to the City of Riverside Fire Department's HAZMAT Section.

Agency	Name/Title	Address	Phone Number
Riverside County Community Health Agency, Dept. of Environmental Health	Sandy Bunchek, Riverside Area Supervisor	4080 Lemon Street Riverside, CA 92501	(951) 955-8980
City of Riverside Fire Department	Tedd Laycock, Fire Chief	3900 Main Street Riverside, CA 925322	(951) 826-5321

6.14.7 References

Agency for Toxic Substances and Disease Registry (ATSDR), 2004. Medical management guidelines for ammonia. http://www.atsdr.cdc.gov.

Agency for Toxic Substances and Disease Registry (ATSDR), 2004. ToxFAQs for sulfur trioxide and sulfuric acid. http://www.atsdr.cdc.gov/tfacts117.html.

California Department of Toxic Substance Control, 2004. Laws, regulations and policies website: http://www.dtsc.ca.gov/LawsRegulationsPolicies/hs_code.html.

Number: VI - 001

City of Riverside

Safety and Health Policies and Procedures Manual

Effective Date: 06/2008
Review Date: 06/2011
Prepared by: City Manager/Finance

Approved:

Department

City Manager

SUBJECT:

Hazard Communication Policy

PURPOSE:

This policy establishes the responsibilities and methods for assessing the hazards of substances in the workplace and ensures that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to all City employees by means of comprehensive hazard communication programs, including container labeling and other forms of warning, material safety data sheets, and employee training.

The Hazard Communication Policy is an element of the City's Injury and Illness Prevention Plan (Safety and Health Policies and Procedures Manual I – 001) and enables the City to comply with the requirements of California Code of Regulations (CCR) Title 8 Section 5194 and of Fed/OSHA 29CFR (1910.1200).

POLICY:

Each department/division shall provide the resources and take whatever action is necessary to ensure the success of the City's hazard communication program. All levels of management shall support the program and ensure that it is implemented and that its requirements are communicated to affected employees. Full compliance with the requirements of the hazard communication program (Material Safety Data Sheets, labeling of containers), as presented in this policy statement and in its Appendices, is mandatory.

Discipline for non-compliance shall be accordance with the Human Resources Policy and Procedures Manual, Section III –1.

PROCEDURE:

Responsibility	Action
City Manager	1. Implement the City program for hazard communication.
	2. Ensure that department heads are held responsible and accountable for the performance and actions of their departments/divisions relative to hazard communication.
Department Heads	3. Periodically review the requirements of the hazard communication program with Division Heads and Supervisors and document that review.

PROCEDURE:

Responsibility	Action
Division Heads/Supervisors	4. Ensure that all containers of hazardous chemicals and materials are properly labeled. 5. Generate a comprehensive list, with locations noted, of the hazardous chemicals/materials used and/or stored within areas under their supervision. 6. Obtain a Material Safety Data Sheet (MSDS) for each identified hazardous chemical/material to which employees under their supervision, or in areas under their supervision, may be exposed. (See Appendix B) 7. Ensure that the Material Safety Data Sheets are readily accessible, during each work shift, to employees, their physicians, or their collective bargaining agents, when they are in their work area(s). Exercise of this employee right shall not result in discharge or retaliation. 8. Train employees under their supervision in the elements of the City's hazard communication program upon initial assignment to a work task or whenever a new hazardous chemical/material is introduced into the work area, and annually thereafter. (See Appendix C) 9. Maintain hazardous substance training records, with dates and original signatures for employees and trainers, for each employee. 10. Meet with on-site contractors to advise them of the hazardous chemicals/materials to which their employees may be exposed and to determine any hazardous chemicals/materials to which such contractors may expose City employees and to require appropriate measures to protect City employees from said hazardous chemicals/materials. 11. Inform employees of their right to receive information regarding hazardous chemicals/materials to which they may be exposed, or their right to have their physicians and collective bargaining agents receive this information, and of their protection against discharge or other retaliation due to having exercised these rights.
City Employees	12. Attend training in the physical and health hazards of substances in the work area and the measures available to them to protect themselves against hazards, including appropriate work practices, emergency procedures, and personal protective equipment. 13. Follow safe procedures for working with hazardous chemicals/materials as provided in training and as specified in Material Safety Data Sheets. 14. Use the required personal protective equipment for each hazardous chemical/material as specified in Material Safety Data Sheets. 15. Inform management and/or supervision of any hazardous chemical/material to which they may be exposed and for which they have received neither training nor a Material Safety Data Sheet. 16. Follow the National Fire Protection Association (NFPA) 704 standard that prohibits any unmarked container containing chemicals being used in conjunction with any duties or assignments unless the container is portable and in control of a specific person for their immediate use. (See Appendix D) 17. Follow clean up procedures in the event of a spill and dispose of hazardous chemicals/materials as specified in Material Safety Data Sheets.

PROCEDURE:

Responsibility	Action
	18. Report to management and/or supervision any concerns encountered while working with hazardous chemicals/materials.
	19. Use only hazardous chemicals/materials approved for use by management and/or supervision.
	20. Chemicals/materials designated for disposal shall be labeled as Hazardous Waste, with the label including the name of the waste, the disposing department, and the waste accumulation date. Hazardous Waste labels are available from supervisors at the Corporation Yard, the Utilities Operations Center, and the Sewerage Division. Material Safety Data Sheets should be stored with the hazardous waste. Either the Fleet Management/Building Services Superintendent or the Fleet Operations Manager may be contacted for access to the Hazardous Waste Storage Shed.
Safety Officer	21. Provide hazard analysis assistance.
	22. Coordinate training requirements.
	23. Maintain a database of hazardous chemicals/materials used by City employees in the course of their work.
	24. Review Material Safety Data Sheets for all proposed purchases of new chemicals/materials.
Purchasing Division	25. Ensure Safety Officer concurrence prior to purchase of any new chemical/material.
	26. Require vendors/manufacturers to provide a current Material Safety Data Sheet with every shipment of a chemical/material.

Attachments:

1. Appendix A – Definition of Terms
2. Appendix B – Material Safety Data Sheet Program
3. Appendix C – Training Program
4. Appendix D – Labeling of Containers Program

Distribution: Regular

Appendix A

Definition of Terms Associated With Material Safety Data Sheets

Acid – A substance that dissolves in water, or certain other solvents, and releases hydrogen ions.

American Conference of Governmental Industrial Hygienists (ACGIH) -- An organization of professionals in governmental agencies or educational institutions engaged in occupational safety and health programs. ACGIH develops and publishes recommended occupational exposure limits for chemical substances and physical agents.

Alkaline – Having the ability to neutralize an acid and form a salt.

American National Standards Institute (ANSI) – A private organization that recommends work practices and engineering designs pertaining to safety and health.

Carcinogen – A chemical or physical agent capable of causing cancer. Such an agent is often described as carcinogenic.

Chemical – Any element, chemical compound, or mixture of elements and/or compounds.

Chemical Abstracts Service (CAS) – A private organization that indexes information published in "chemical abstracts". CAS numbers identify specific chemicals.

Chemical Name – The scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or Chemical Abstracts Service (CAS) rules of nomenclature, or a name which will clearly identify the chemical for the purpose of conducting a hazard evaluation.

Combustible Liquid – Any liquid having a flash point at or above 100 F (37.8 C), but below 200 F (93.3 C), except any mixture having components with flashpoints of 200 F (93.3 C) or higher, the total volume of which makes up 99 percent or more of the total volume of the mixture.

Compressed Gas – 1) A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70 F (21.1 C); or, 2) A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130 F (54.4 C), regardless of the pressure at 70 F (21.1 C); or, 3) A liquid having a vapor pressure exceeding 40 psi at 100 F (37.8 C).

Corrosive – A liquid or solid that causes visible destruction or irreversible alterations in human skin tissue at the site of contact.

Decomposition – Breakdown of a chemical (by heat, chemical reactions, etc.) into simpler parts, compounds, or elements.

Dose – The amount of a chemical absorbed in a unit volume of a tissue or in the whole body. Usually expressed in milligrams per kilogram (mg/kg).

Duration – The length of time exposed to a substance.

Evaporation – The process by which a liquid is changed into a vapor state and mixed into the surrounding air.

Explosive – A chemical that causes a sudden, almost instantaneous, release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

Flammable – A liquid that has a flash point below 100 F (37.8 C).

Flash Point – The lowest temperature at which a liquid gives off enough flammable vapor to ignite and produce a flame when an ignition source is present.

Hazardous Chemical – Any chemical that is a physical hazard or health hazard.

Immediate Use – The hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.

Incompatibles – Materials that could cause dangerous reactions from direct contact with one another.

Irritant – A substance that can cause an inflammatory response or reaction in the eyes, the skin, or the respiratory system.

Label – Any written, printed, or graphic material, displayed on or affixed to containers of hazardous materials.

Material Safety Data Sheet (MSDS) – A form listing the properties and hazards of a hazardous substance.

Mutagenic – A material that induces genetic changes (mutations) in the DNA of chromosomes.

National Fire Protection Association (NFPA) – An international voluntary membership organization to promote/improve fire protection and prevention and establish safeguards against loss of life and property by fire.

National Institute of Occupational Safety and Health (NIOSH) – The agency of the Public Health Service that tests and certifies respiratory and air sampling devices. It recommends exposure limits and conducts investigations and research in workplace safety.

Occupational Safety and Health Administration (OSHA) – The regulatory and enforcement agency for safety and health in most US industrial sectors.

Oxidizer – A chemical other than a blasting agent or explosive that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

Pyrophoric – A chemical that will ignite spontaneously in air at a temperature of 130 F (54.4 C) or below.

Reactivity – The ability of a substance to undergo a chemical reaction such as combining with another substance. Also referred to as *unstable* or *self-reactive.*

Responsible Party – Someone who can provide additional information on the hazardous chemical and appropriate emergency procedures.

Route of Entry – The means by which a hazardous substance enters the body. Common routes are inhalation, ingestion, eye contact, and skin contact.

Solvent – A substance (most commonly water, but often an organic compound) that dissolves another substance.

Systemic Effect – An effect of a hazardous material on a part of the body other than that at which it entered.

Teratogenic – Causes malformation of an embryo or fetus.

Threshold Limit Value (TLV) – A term used by ACGIH to express the airborne concentration of material to which nearly all workers can be exposed day after day without adverse effects. "Workers" means healthy individuals. The young, old, ill, or naturally susceptible will have lower tolerances and need to take additional precautions.

Time Weighted Average (TWA) – The average concentration of a chemical in air over the total exposure time. In most cases, it is the calculation or measurement of an employee's exposure to an airborne contaminant during an eight-hour period.

Toxicity – The extent to which a substance will cause harmful effects.

UN Number – A registry number assigned to dangerous commonly carried goods by the United Nations Committee of Experts on the Transport of Dangerous Goods. This UN number is required in shipping documentation on packaging as a part of the Department of Transportation's regulations for shipping hazardous materials.

Volatility – A measure of how quickly a substance forms a vapor at ordinary temperatures.

Water-Reactive – A chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

Appendix B

Material Safety Data Sheet Program

Material Safety Data Sheets (MSDSs) provide important information about chemical products and their ingredients. Manufacturers use different layouts and different styles for their Material Safety Data Sheets, but all provide the required information. Following is a description of the required information:

Product Identity

- Manufacturer's name, address, phone number
- Chemical name of the product
- Any other names under which the product is sold
- Chemical family
- Chemical formula
- Chemical Abstracts Service (CAS) number

Hazardous Ingredients

- Specific ingredients
- Their approximate percentages
- The OSHA permissible exposure limit, ACGIH Threshold Limit Values, and any other exposure limit used or recommended by the manufacturer or importer.

Physical/Chemical Characteristics

- Appearance
- Odor
- Boiling point
- Specific gravity
- Solubility in water

Fire and Explosion Data

- Flammability
- Flash point
- Firefighting procedures
- Correct type of fire extinguisher

Reactivity Data

- Potential of the substance to react with other materials to produce fire, explosion, or new toxic substances
- Gives conditions to avoid: e.g. extreme temperatures, shaking or jarring, proximity to specific incompatible chemicals

Health Hazards Data

- Acute and chronic effects
- Whether the substance is carcinogenic, mutagenic, or teratogenic

- Potential routes of entry of the hazardous substance into the body
- Emergency and first aid procedures

Precautions for Safe Handling, Use, and Storage

- How to handle spills and leaks
- How to dispose of the substance safely
- Protective measures relative to handling, use, and storage

Control Measures/Protection Information

- Means of reducing exposure through engineering, work practices, and personal protective equipment

Additional Information

- Date of Material Safety Data Sheet preparation or date of last change in contents
- Name, address, and telephone number of the party responsible for preparing the Material Safety Data Sheet so that that person could, if necessary, provide additional information, including emergency procedures on the hazardous substance in question.

Department Heads, Division Heads, and Supervisors, or their designee, shall review Material Safety Data Sheets when considering the purchase of new products and/or product replacements and shall forward these sheets to the appropriate Safety Officer for further consideration. If it is determined that the subject product will be used, the MSDS shall be stamped "Approved", signed and dated by the appropriate Safety Officer, and marked with the name of any product being replaced. The following procedure shall be mandatory for procuring hazardous chemicals and materials:

1. Central Stores – Prior to requesting an item to be carried in the Central Stores inventory, an approved MSDS shall accompany the request for stocking the new material.

2. Direct Purchase – A copy of the approved MSDS shall accompany the purchase requisition.

3. Supervisors must verify that an approved MSDS is available before allowing new hazardous chemicals/materials to be purchased and used.

Any City employee who becomes aware that there is a hazardous chemical/material in the workplace for which a MSDS is not available shall contact their supervisor or the appropriate Safety Officer so that one can be obtained.

In the event that an employee is exposed to a hazardous chemical/material and requires medical treatment, a MSDS must be readily available to send immediately to the attending physician.

Each department/division shall update their inventory lists of hazardous chemicals/materials, along with storage locations and MSDS library, on a continuing

basis. Any changes in the inventory shall be reported to the appropriate Safety Officer so that the database can be maintained to comply with Cal/OSHA requirements.

Appendix C

Training Program

All employees shall be provided with information and training on hazardous chemicals and materials in their work area at the time of initial assignment, and whenever a new hazardous chemical/material is introduced into their work area. Information and training may relate to general classes of hazardous chemicals/materials to the extent appropriate and related to reasonably foreseeable exposures on the job.

Information and training shall ensure that employees are informed of:

1. The requirements of the City's and the department/division's hazard communication policy. All employees shall be so informed as a part of their orientation at the time of hire and employees exposed to hazardous chemicals/materials in the work area shall receive annual refresher training.

2. Any operations in the work area where hazardous chemicals/materials are present.

3. The location and availability of the City's and the department/division's written hazard communication program, including list(s) of hazardous chemicals/materials and Material Safety Data Sheets required by this section.

4. The methods and observations that may be used to detect the presence or release of a hazardous chemical/material in the work area (such as the use of monitoring devices, the visual appearance or odor of hazardous chemicals/materials when being released, etc.).

5. The physical and health hazards of the work area, and the measures that they can take to protect themselves from these hazards, including specific procedures that the City has implemented to protect employees from exposure to hazardous chemicals/materials, such as appropriate work practices, emergency procedures (including spill response/clean-up/disposal and exposure first aid), and personal protective equipment to be used.

6. The details of the City's and the department/division's hazard communication program, including an explanation of the labeling system and of Material Safety Data Sheets, and how employees can obtain and use the appropriate information.

Appendix D

Labeling of Containers Program

1. The City's hazard communication policy requires that all containers of hazardous chemicals/materials be labeled using the National Fire Protection Association (NFPA) 704 Standard System for the Identification of the Fire Hazards of Materials. The labeling system is to label inadequately identified original containers to portable or stationary containers. This system provides a simple, readily recognized, easily understood system of marking that provides a general idea of the hazards and the severity of these hazards as they relate to handling, fire prevention, exposure, and control. The NFPA labels are divided into four sections of a diamond, each section marked with different colors and numbers. These sections represent the following:

FIRE HAZARD (Red)

0 - Will not burn

1 - Will ignite if preheated

2 - Will ignite if moderately heated

3 - Will ignite at most ambient conditions

4 - Burns readily at ambient conditions

HEALTH HAZARD (Blue)

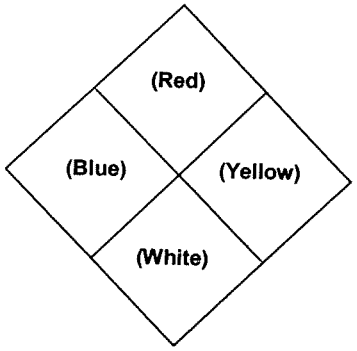
0 - Ordinary combustible hazards in a fire

1 - Slightly hazardous

2 - Hazardous

3 - Extreme danger

4 - Deadly



REACTIVITY (Yellow)

0 - Stable and not reactive with water

1 - Unstable if heated

2 - Violent chemical change

3 - Shock and heat may detonate

4 - May detonate

SPECIFIC HAZARD (White)

OX Oxidizer

ACID Acid

ALK Alkali

COR Corrosive

-W- Use No Water

Radiation Hazard

2. No container of hazardous chemical/material will be released for use until properly labeled, in English, to identify its contents and the appropriate hazard warnings.

3. All secondary/auxiliary containers will be labeled in the same manner. Labels that meet the requirements of the City's hazard communication program for the hazardous material NFPA coding system and for hazardous waste are available in Central Stores.

4. Labels for primary containers shall also include the name and address of the manufacturer.

5. Material Safety Data Sheets shall be consulted to determine labeling requirements for each chemical/material. It is a requirement that the chemical/ material name be placed on the label must be the same as that on the MSDS.

6. Employees shall not remove or deface existing labels on containers of hazardous chemicals/materials.

7. Employees shall ensure that labels remain legible and prominently displayed on containers.

8. Portable containers for immediate use during a single shift by a single employee who performs the transfer himself/herself are exempt from the labeling requirement.

9. Labeling requirements will also not apply to: 1) any pesticide as such term is defined in the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 et seq.), when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Environmental Protection Agency; or 2) any consumer product or hazardous substance as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.), respectively, when subject to a consumer product safety standard or labeling requirement of those Acts or to regulations issued under those Acts by the Consumer Product Safety Commission and when maintained in its original container.

City of Riverside
Safety and Health Policies and Procedures Manual

Effective Date: 06/2008
Review Date: 06/2010
Prepared by: City Manager/Finance

Approved:

Department

City Manager

SUBJECT:

HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE POLICY

PURPOSE:

This policy establishes the minimum requirements for controlling employee exposure, or the reasonable possibility for employee exposure, to hazardous substances. The Hazardous Waste Operations and Emergency Response Policy is an element in the City's Injury and Illness Prevention Plan (Safety and Health Policies and Procedures Manual, Section I - 001) and enables the City to comply with the requirements of California Code of Regulations (CCR) Title 8 Section 5192 and of Fed/OSHA 29CFR (1910.120).

POLICY:

Each department/division shall develop formal written procedures for the control of, and emergency response relative to the specific hazards common to its operation in accordance with Appendix C. Any specific hazard not addressed in a department/division procedure, or for an individual jobsite, shall be addressed in a manner consistent with the standards in Appendix D.

The responsibility for seeing that this policy and its associated procedures are followed is binding upon all authorized and affected employees. Affected employees subject to the requirements of this policy and to training on their duties within it, include, but are not limited to, those individuals whose job duties require working with, or in the proximity of, known or potentially hazardous materials. Employees not otherwise identified shall be considered "Other Use Employees" and shall be trained on the recognition of hazardous and potentially hazardous materials; on general precautions regarding their use, safe storage, and proximity; and, on the purpose of this policy.

This policy, with its appendices, sets mandatory standards for behavior. Management and Supervision are responsible for ensuring that all elements of this program are implemented and shall enforce its requirements. Discipline for non-compliance shall be in accordance with the Human Resources Policy and Procedures Manual, Section III – 1.

PROCEDURE:

Responsibility	Action
City Manager	1. Implement the City policy for hazardous waste operations and emergency response.
	2. Ensure that all levels of management are held responsible and accountable for the performance and actions of their departments/divisions relative to the hazardous waste operations and emergency response policy.
Department Heads	3. Periodically review the requirements of the hazardous waste and emergency response policy with Division Heads and Supervisors.
Division Heads/Supervisors	4. Evaluate the workplace to identify all hazardous or potentially hazardous materials with which employees to which employees might reasonably be exposed.
	5. Identify, by job classification, those individuals that are either authorized or affected employees.
	6. Ensure that all employees receive training, suitable to need, on the hazardous waste operations and emergency response policy. See Appendix G.
	7. Ensure that all training records, with dates and original signatures for all employers and trainers, are maintained.
	8. Ensure that all requirements of the hazardous waste operations and emergency response policy are followed.
All City Employees	9. Follow all applicable requirements for hazardous waste operations and emergency response.
Safety Officers	10. Coordinate training assistance.
	11. Monitor effectiveness of the hazardous waste operations and emergency response policy and provide amendments as necessary.
	12. Review policy for effectiveness every two years.

Attachments:

1. Appendix A – Definition of Terms
2. Appendix B – Organizational Structure
3. Appendix C – Comprehensive Workplans
4. Appendix D – Site-Specific Safety and Health Plans
5. Appendix E – Site Characterization and Analysis
6. Appendix F – Site Control and Security
7. Appendix G – Training
8. Appendix H – Medical Surveillance
9. Appendix I – Engineering and Administrative Controls
10. Appendix J – Monitoring
11. Appendix K – Informational Programs
12. Appendix L – Handling Drums and Containers
13. Appendix M – Decontamination
14. Appendix N – Emergency Response by Employees at Uncontrolled Hazardous Waste Sites
15. Appendix O – Illumination

16. Appendix P– Sanitation at Temporary Workplaces
17. Appendix Q– New Technology Programs

Distribution: Regular

Appendix A

Definition of Terms

Buddy system – A system of organizing employees into work groups in such a manner that each employee of the work group is designated to be observed by at least one other employee in the work group. The purpose of the buddy system is to provide quick assistance to employees in the event of an emergency.

Certified employee – An employee who has completed all of the requirements for training certification.

Certified supervisor – A supervisor that has completed all of the requirements for training certification.

Clean-up operation – An operation in which hazardous substances are removed, contained, incinerated, neutralized, stabilized, cleared-up, or in any other manner processed or handled with the ultimate goal of making the site safer for people or the environment.

Decontamination – The removal of hazardous substances from employees and their equipment to the extent necessary to preclude the occurrence of foreseeable adverse health effects.

Emergency response – A response effort by employees from outside the immediate release area of by other designated responders to an occurrence which results, or is likely to result, in an uncontrolled release, which may cause high levels of exposure to toxic substances, or which poses danger to employees requiring immediate attention. Responses to incidental releases of hazardous substances in which the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area, or by maintenance personnel, are not considered be emergency responses within the scope of this standard. *Note: The "immediate release area" can be the entire geographic boundary of the employee's assigned work area.* Responses to releases of hazardous substances in which there is no immediate safety or health hazard (i.e., fire, explosion, or chemical exposure) are not considered to be emergency responses.

Facility – A. Any building, structure, installation, equipment, pipe, or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, storage container, motor vehicle, rolling stock, or aircraft; or, B. Any site or area in which a hazardous substance has been deposited, stored, disposed of, placed, or otherwise come to be located – not including any consumer product in consumer use.

Hazardous materials response (HAZMAT) team – An organized group of employees, designated by the employer, which is expected to perform work to handle and control actual or potential leaks or spills of hazardous substances requiring possible close approach to the substance. Team members perform responses to releases or potential releases of hazardous substances for the purpose of control or stabilization of the incident.

Hazardous substance – Any substance designated or listed below, exposure to which results, or may result in, adverse affects on the health or safety of employees.

Any substance defined under Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act or under Sections 25316 and 25317 of the California Health and Safety Code;
Any biological agent and other disease-causing agent which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any person, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations in such persons or their offspring;
Any substance listed by the U.S. Department of Transportation and regulated as hazardous materials under 49 CFR 172.101 and appendices; and,
Hazardous waste as herein defined.

Hazardous substance removal work – Clean-up work at any of the following:
A site where removal or remedial action is taken pursuant to any of the following:
Chapter 6.8 (commencing with Section 25300) of Division 20 of the Health and Safety Code, regardless of whether the site is listed pursuant to Section 25356 of the Health and Safety Code.
The federal Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 U.S.C. Sec. 9601 et seq.
Any clean-up operations required by a governmental body, whether federal, state, local, or other involving hazardous substances that are conducted at uncontrolled hazardous waste sites (including, but not limited to, the Environmental Protection Agency's (EPA) National Priority Site List (NPL), state priority site lists, sites recommended for the EPA, NPL, and initial investigations of government identified sites which are conducted before the presence or absence of hazardous substances has been ascertained; and, any corrective actions involving hazardous waste clean-up operations at sites covered by the Resource Conservation and Recovery Act of 1976 (RCRA) as amended (42 U.S.C. 6901, et seq.) and Chapters 6.5 and 6.8 of Division 20 of the California Health and Safety Code; or by agencies under agreement with U.S.E.P.A. to implement RCRA regulations; and, any voluntary clean-up operations at sites recognized by federal state, local or other governmental bodies as uncontrolled hazardous waste sites.

A site where corrective action is taken pursuant to Section 25187 or 25200.10 of the Health and Safety Code or the federal Resource Conservation and Recovery Act of 1976 (42 U.S.C. Sec. 6901 et seq.)

A site where clean-up of a discharge of a hazardous substance is required pursuant to Division 7 (commencing with Section 13000) of the Water Code.

A site where removal or remedial action is taken because a hazardous substance has been discharged or released in an amount reportable pursuant to Section 13271 of the Water Code or the federal Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 U.S.C. Sec. 6901 et seq.). Hazardous substance removal work does not include work related to a hazardous substance spill on a highway.

Hazardous waste – A waste or combination of wastes as defined in 40 CFR 261.3, or regulated as hazardous waste in California pursuant to Chapter 6.5, Division 20, California Health and Safety Code, or those substances defined as hazardous wastes in 49 CFR 171.8.

Hazardous waste operation – Any operation conducted within the scope of this regulation

including hazardous substance removal work as defined in Labor Code Section 142.7(b).

Hazardous waste site – Any facility or location at which hazardous waste operations within the scope of this regulation take place.

Health hazard – A chemical, mixture of chemicals, or a pathogen for which there is statistically significant evidence, based on at least one study conducted in accordance with established scientific principles, that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens; toxic or highly toxic agents; reproductive toxins; irritants; corrosives; sensitizers; hepatotoxins; nephrotoxins; neurotoxins; agents which act on the hemotopoietic system; and agents which act on the hematopoietic system; and agents which damage the lungs, skin, eyes, or mucous membranes. It also includes stress due to temperature extremes. Further definition of the terms used above can be found in Title 8, California Code of Regulations, Section 5194.

IDLH, or Immediately dangerous to life or health – An atmospheric concentration of any toxic, corrosive, or asphyxiant substance that poses an immediate threat to life or would cause irreversible or delayed adverse health effects or would interfere with an individual's ability to escape from a dangerous atmosphere.

Incident Commander – The person in charge of the incident site who is responsible for all decisions relating to the management of the incident.

Incidental release – An incidental release is one that does not cause a health or safety hazard to employees and does not need to be cleaned up immediately to prevent death or serious injury to employees.

Oxygen deficiency – That concentration of oxygen by volume below which air supplying respiratory protection must be provided. It exists in atmospheres in which the percentage of oxygen by volume is less than 19.5% oxygen.

Permissible exposure limit (PEL) – The exposure, inhalation, or dermal permissible exposure limit specified in 8 CCR, Chapter 4, Subchapter 7, Groups 14 and 15; and Group 16, Articles 107, 109, and 110.

Post-emergency response – That portion of an emergency response performed after the immediate threat of a release has been stabilized or eliminated and clean-up of the site has begun. If post-emergency response is performed by an employer's own employees who were part of the initial emergency response, it is considered to be part of the initial response and not post-emergency response. However, if a group of an employer's own employees, separate from the group providing initial response, performs the clean-up operation, then the separate group of employees would be considered to be performing post-emergency response.

Pre-job health and safety conference – A health and safety conference or briefing held prior to entering a site for the purpose of initiating hazardous substance removal work.

Published exposure level – The exposure limits published in "NIOSH Recommendations for Occupational Safety and Health Standards 1988" incorporated by reference, or, if no limit is

specified, the exposure limits published in the standards specified by the American Conference of Governmental Industrial Hygienists in their publication, "Threshold Limit Values and Biological Exposure Indices for 1989 – 90" dated 1989.

Qualified person – A person with specific training, knowledge, and experience in the area for which the person has the responsibility and the authority to control.

Site safety and health supervisor (or official) – The individual located on a hazardous waste site who is responsible to the employer and has the authority and knowledge necessary to implement the site safety and health plan and verify compliance with applicable safety and health requirements.

Small quantity generator – A generator of hazardous wastes who in any calendar month generates no more than 1000 kilograms (2025 pounds) of hazardous waste in that month.

Uncontrolled hazardous waste site – An area in which an accumulation of hazardous waste creates a threat to the health and safety of individuals or the environment or both. Some sites are found on public lands, such as those created by former municipal, county, or state landfills where illegal or poorly managed waste disposal has taken place. Other sites are found on private property, often belonging to generators or former generators of hazardous waste. Examples of such sites include, but are not limited to, surface impoundments, landfills, dumps, and tank or drum farms.

Uncontrolled release – The accidental release of a hazardous substance from its container. If not contained, stopped, and removed, the release would pose a hazard to employees in the immediate area or in areas in the path of the release, or from it byproducts or its effects (such as toxic vapors, over-pressurization, toxic gases, or toxic particulates.

Appendix B

Organizational Structure

The organizational structure of the City's Hazardous Waste Operations and Emergency Response program establishes the specific chain of command and specifies the overall responsibilities of supervisors and employees.

Personnel

For major hazardous waste and material release incidents, the City Fire Department shall be contacted for incident command. Until the Fire Department's arrival or in the event of minor clean-up incidents, the following chain of command shall be established and followed:

General Supervisor – Has responsibility and authority to direct all hazardous waste operations. **May delegate Incident Commander duties to other qualified personnel.**

Site Safety and Health Supervisor – Has responsibility and authority to develop and implement the site safety and health plan and verify compliance. May also be the General Supervisor.

Qualified Person for Operations Defined as Hazardous Substance Removal Work – Has responsibility for scheduling any air sampling, laboratory calibration of sampling equipment, evaluation of soil or other contaminated materials sampling results, and for conducting any equipment testing and evaluating test results.

Other Personnel – Has responsibility to conduct hazardous waste removal work under direction of the General Supervisor **or delegated Incident Commander.**

Lines of Authority, Responsibility, and Communication

The Superintendent is ultimately responsible for all hazardous waste removal. The General Supervisor coordinates the efforts of the Site Safety and Health Inspector and the Qualified Person for Operations Defined as Hazardous Substance Removal Work and acts as the Superintendent's representative in directing all hazardous waste operations.

The role of Site Safety and Health Supervisor may be deferred to a Safety Officer or designee if no one in the division is both trained and available to perform this role.

Departments/divisions will develop specific procedures for the lines of communication within their specific department/division.

Review

All issues regarding organizational structure and the lines of authority, responsibility, and communication will be reviewed annually by each department/division responsible, or potentially responsible, for hazardous waste removal to reflect the current status of waste site operations.

Outside Contractors

When an outside contractor is brought in to conduct remediation activities, that contractor shall establish an internal organizational structure that conforms to state and federal guidelines and directives. **The outside contractor is present for special remediation activities only and is not the Incident Commander. The outside contractor reports to the City's Incident Commander.**

Appendix C

Comprehensive Workplans

Each department/division responsible, or potentially responsible, for hazardous waste operations shall develop a comprehensive workplan that shall address the tasks and objectives of the site operations and the logistics and resources required to achieve those tasks and objectives.

Comprehensive workplans shall:

A. Address anticipated clean-up activities, as well as normal operating procedures, but need not repeat the employer's procedures available elsewhere.

B. Define work tasks and objectives and identify the methods for accomplishing those tasks and objectives.

C. Establish personnel requirements for implementing the plan.

D. Identify the training required for safe clean-up activities, as well as for normal operating procedures, as well as the positions for which such training must be provided. (See Appendix G)

E. Provide for the implementation of the required informational programs. (See Appendix K)

F. Identify positions that must be included in the medical surveillance program. (See Appendix H)

Departments/divisions that are essentially administrative in nature (e.g., City Clerk, Human Resources) need not develop a special plan and may follow the applicable requirements of this policy.

Appendix D

Site-Specific Safety and Health Plans

Departments/divisions shall develop site safety and health plans, which must be kept on site, which shall address the safety and health hazards of each phase of site operation, and shall include the requirements and procedures for employee protection.

The site safety and health plan, as a minimum, shall address the following:

A. A safety and health risk analysis for each site task and operation found in the workplan.

B. Employee training assignments. (See Appendix G)

C. Personal protective equipment (PPE) to be used by employees for each of the site tasks and operations being conducted as required. (See Appendix I)

D. Medical surveillance requirements. (See Appendix H)

E. Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment to be used.

F. Site control measures. (See Appendix F)

G. Decontamination procedures. (See Appendix M)

H. An emergency response plan for safe and effective responses to emergencies, including the necessary PPE and other equipment. (See Appendix B, Appendix C, Appendix I, and Appendix N)

I. Confined space entry procedures. (See Safety and Health Policies and Procedures Manual, Section V – 005)

J. A spill containment program. (See Appendix L)

Site-specific safety and health plans shall provide for pre-entry briefings to be held prior to initiating any site activity, and at such other times as necessary to ensure that employees are apprised of the site safety and health plan and that this plan is being followed. The information and data obtained from site characterization and analysis work (see Appendix E) shall be used to prepare and update site safety and health plans.

For operations defined as hazardous substance removal work, a pre-job health and safety conference shall be held before the start of actual work. The conference shall include affected supervisors, employees, employee representatives, and contractors and shall include a discussion of the health and safety program and the means, methods, devices, processes, conditions,

practices, or operations with the department/division intends to use in providing a safe and healthy place of employment.

Inspections shall be conducted by the site safety and health inspector or, in the absence of that individual, a Safety Officer or designee to determine the effectiveness of the site safety and health plan.

Any deficiencies in the effectiveness of the site safety and health plan shall be corrected by the department/division and reflected in a revised plan.

In the case of a site for which no plan exists, any response to a release of an unknown substance or substances shall be treated with a high degree of caution. The Riverside Fire Department Hazardous Materials Unit or contracted hazardous material/waste company shall be called to respond to the release. Other employees shall not enter the contamination area and shall keep all unauthorized persons away from the release.

Appendix E

Site Characterization and Analysis

Hazardous waste sites shall be evaluated to determine the appropriate safety and health control procedures needed to protect employees from identified hazards.

A preliminary evaluation of a site's characteristics shall be performed prior to site entry by a qualified person to aid in the selection of appropriate employee protection methods prior to site entry. Immediately after initial site entry, a more detailed evaluation of the site's specific characteristics shall be performed by a qualified person to further identify existing site hazards and to further aid in the selection of the appropriate engineering controls and personal protective equipment for the tasks to be performed.

All suspected conditions that may pose inhalation or skin absorption hazards that are immediately dangerous to life or health (IDLH) or other conditions that may cause death or serious harm shall be identified during the preliminary survey and evaluated during the detailed survey. Examples of such hazards include, but are not limited to, confined space entry, potentially explosive or flammable situations, visible vapor clouds, or areas in which biological indicators such as dead animals or vegetation are located.

The following information, to the extent available, shall be obtained by the employer prior to allowing employees to enter a site:

A. Location and approximate size of the site.

B. Hazardous substances and health hazards involved or expected at the site, and their chemical and physical properties.

C. Description of the response activity and/or the job task to be performed.

D. Duration of planned employee activity.

E. Site topography and accessibility by air and roads.

F. Safety and health hazards expected at the site.

G. Pathways for hazardous substance dispersion.

H. Present status and capabilities of emergency response teams that would provide assistance to hazardous waste clean-up site employees at the time of an emergency.

Personal protective equipment (PPE) shall be provided and used during initial site entry in accordance with the following requirements:

A. Based upon the results of the preliminary site evaluation, an ensemble of PPE shall be selected and used during initial site entry which will provide protection to a level of exposure below PELs and published exposure levels for known or suspected hazardous substances and health hazards and will also provide protection against other known and suspected hazards identified during the preliminary site evaluation. If there is no PEL or published exposure level, the employer may use other published studies and information as a guide to appropriate protective equipment.

B. If positive-pressure self-contained breathing apparatus is not used as part of the entry ensemble, and if respiratory protection is warranted by the potential hazards identified during the preliminary site evaluation, an escape self-contained breathing apparatus (SBCA) of at least five minutes duration shall be carried by employees during initial site entry.

C. If the preliminary site evaluation does not produce sufficient information to identify the hazards of the site, an ensemble providing protection equivalent to Level B PPE shall be provided as minimum protection and direct reading instruments shall be used as appropriate for identifying IDLH conditions. (See Appendix I for guidelines on Level B protective equipment and for a description of Level B hazards.)

D. Once the hazards of the site have been identified, the appropriate PPE shall be selected, the appropriate PPE shall be selected and used, in accordance with Appendix I.

The following monitoring shall be conducted during initial site entry when the site evaluation produces information that shows the potential for ionizing radiation or IDLH conditions, or when the site information is not sufficient to rule out these possible conditions:

A. Monitoring with direct reading instruments for hazardous levels of ionizing radiation.

B. Monitoring the air with appropriate direct reading test equipment (i.e., combustible gas meters) for IDLH and other conditions that may cause death or serious harm (combustible or explosive atmospheres, oxygen deficiency, toxic substances).

C. Visually observing for signs or actual or potential IDLH or other dangerous conditions.

D. An ongoing air-monitoring program in accordance with Appendix J shall be implemented after site characterization has determined the site safe for the start of operations.

Once the presence and concentrations of specific hazardous substances and health hazards have been established, the risks associated with these substances shall be identified. Employees who will be working on the site shall be informed of any risks that have been identified. Risks to consider include, but are not limited to:

A. IDLH concentrations.

B. Exposures exceeding the PELs and published exposure levels.

C. Potential skin absorption and irritation sources.

D. Potential eye irritation sources.

E. Explosion sensitivity and flammability ranges.

F. Oxygen deficiency.

Any information concerning the chemical, physical, and toxicologic properties of each substance known or expected to be present on site that is available to the employer and relevant to the duties an employer is expected to perform shall be made available to the affected employees prior to the commencement of their work activities.

Contractors brought in to conduct remediation will be provided the above information, but should be advised to conduct their own assessment and not rely solely on information provided by City employees.

Appendix F

Site Control and Security

Departments/divisions shall establish site control procedures to be implemented to control employee exposure to hazardous substances before clean-up work begins.

A site control program shall be developed during the planning stages of a hazardous waste clean-up operation and modified as necessary as new information becomes available. This site control program shall, as a minimum, include: a site map; the use of a "buddy system"; site communications including alerting means for emergencies; the standard operating procedures/safe work practices; and, identification of nearest medical assistance.

All site control programs shall specify that the site supervisor will allow only authorized personnel with specific clean-up responsibilities to be on-site. No person, City employee or not, without a specific responsibility to the response in progress shall be allowed to enter the site. Personnel without the appropriate PPE shall be prohibited from entering the site.

Appendix G

Training

All employees working on a site exposed to hazardous substances, health hazards, or safety hazards – as well as their supervisors and management responsible for the site – shall receive training meeting the requirements of this subsection before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances, safety, or health hazards. This shall entail both initial training and refresher training, as appropriate.

Employees shall not be permitted to participate in, or supervise, field activities until they have been trained to a level required by their job function and responsibility.

Training shall thoroughly cover the following:

A. Names of personnel and responsible for site safety and health;

B. Safety, health, and other hazards present;

C. Use of PPE;

D. Work practices by which the employee can minimize risks from hazards;

E. Safe use of engineering controls and equipment;

F. Medical surveillance requirements including recognition of symptoms and signs which might indicate overexposure to hazards;

G. Items G through J in the Site-Specific Safety and Health Plan (Appendix D).

General site workers, including supervisory personnel, engaged in hazardous substance removal or other activities that expose or potentially expose workers to hazardous substances and health hazards shall receive a minimum of 40 hours of instruction off the site, and a minimum of three days actual field experience under the direct supervision of a trained and experienced supervisor.

Workers on site only occasionally for a specific limited task (such as, but not limited to, ground water monitoring or land surveying) and who are unlikely to be exposed over PELs and published exposure levels shall receive a minimum of 24 hours instruction off the site, and a minimum of one day actual field experience under the direct supervision of a trained and experienced supervisor.

Workers regularly on site in areas for which monitoring ensures that exposures are under PELs and published exposure levels for which respirators are not necessary, and the site characterization indicates that there are no health hazards or the possibility of an emergency developing, shall receive a minimum of 24 hours of instruction off the site and a minimum of one day actual field experience under the direct supervision of a trained and experienced supervisor.

On-site management and supervisors directly responsible for, or who supervise employees engaged in, hazardous waste operations shall receive 40 hours initial training, and three days of supervised field experience (the training may be reduced to 24 hours and one day if the only area of their responsibility is employees who are on site only occasionally for a specific limited task or who are regularly on site in areas for which monitoring ensures that exposures are under PELs and published exposure levels for which respirators are not necessary) and at least eight additional hours of specialized hazardous waste operations management training at the time of job assignment as a supervisor on such topics as, but not limited to, the City's safety and health program and the associated employee training program, PPE program, spill containment program, and health hazard monitoring procedure and techniques.

Trainers shall be qualified to instruct employees about the subject matter that is presented in training. Such trainers shall have satisfactorily completed a training program for teaching the subjects they are expected to teach, or they shall have the academic credentials and instructional experience necessary for teaching the subjects. Instructors shall demonstrate competent instructional skills and knowledge of the applicable subject matter.

Employees and supervisors who have received and successfully completed the required training and field experience shall be certified by their instructor or the head instructor and trained supervisor as having completed that training. A written certificate shall be given to each person so certified. Any person who has not been so certified, or who has not received equivalent training as described below, shall be prohibited from engaging in hazardous waste operations.

Employers who can show by documentation or certification that an employee's work experience and/or training has resulted in training equivalent to the required training shall not be required to provide the initial training requirements. However, certified employees or employees with equivalent training new to the department/division or to the assignment shall receive appropriate specific training and have appropriate supervised field experience. Equivalent training includes any academic training or the training that existing employees might have already received from actual hazardous waste site work experience.

Employees who are engaged in responding to hazardous emergency situations at hazardous waste clean-up sites that may expose them to hazardous substances shall be trained in how to respond to such expected emergencies.

All employees working on site and their supervisors and managers responsible for the site shall receive eight hours of refresher training annually on all topics required in their initial training, on any critique of incidents that have occurred in the past year can serve as training examples, and other relevant topics.

Appendix H

Medical Surveillance

The City of Riverside maintains a medical surveillance program for the following employees:

A. Any employee who is or may be exposed to hazardous substances or health hazards at or above the PELs or, if there is no PEL, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more per year.

B. Any employee who wears a respirator during any part of a day for a period of 30 days or more in a year.

C. Any employee who is injured, becomes ill, or develops signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation; and

D. Members of HAZMAT teams.

The City shall also make medical examinations and consultations available to each employee cited in A, B, or D above, on the following schedules:

A. Prior to assignment.

B. At least once every twelve months for each employee covered, unless the attending physician believes a longer interval (not greater than once every 24 months) is appropriate.

C. At termination of employment or reassignment to an area where the employee would not be covered if the employee has not had an examination within the last six months.

D. As soon as possible, upon notification by an employee either that the employee has developed signs or symptoms indicating possible overexposure to hazardous substances or health hazards or that the employee has been injured or exposed above the PELs or published exposure levels in an emergency situation.

E. At more frequent times, if the examining physician determines that an increased frequency of examination is medically necessary.

Medical examinations for said employees shall include a medical and work history (or updated history if one is in the employee's medical file) with special emphasis on symptoms related to the handling of hazardous substances and health hazards, and to fitness for duty including the ability to wear any required PPE under conditions that may be expected at the work site.

For any employee who is injured, becomes ill, or develops signs or symptoms due to possible overexposure involving hazardous substance or health hazards from an emergency response or

hazardous waste operation; or who may have been injured, received a health impairment, developed signs or symptoms which may have resulted from exposure to hazardous substances resulting from an emergency incident, or was exposed during an emergency incident to hazardous substances above the PELs or the published exposure levels without the necessary PPE being used, medical examinations and consultations shall be made available by the City on the following schedule:

A. As soon as possible following the emergency incident or development of signs or symptoms; and,

B. At additional times, if the examining physician determines that follow-up examinations or consultations are medically necessary.

All medical examinations and procedures shall be performed by or under the supervision of a licensed physician, preferably one knowledgeable in occupational medicine, and shall be provided without cost to the employee, without loss of pay, and at a reasonable time and place.

The City shall provide the attending physician with one copy of this policy, with its appendices, as well as with one copy of California Code of Regulations Title 8, Section 5192. In addition, the City shall provide the attending physician with the following for each employee:

A. A description of the employee's duties as they relate to the employee's exposures.

B. Each employee's exposure levels or anticipated exposure levels.

C. A description of any PPE used or to be used by the employee.

D. Information from previous medical examinations not readily available to the examining physician.

E. Information required by the City's Respiratory Protection Program.

The City shall provide the employee with a copy of a written opinion from the examining physician containing the following:

A. The physician's opinion as to whether the employee has any detected medical conditions that would place the employee at increased risk of material impairment of the employee's health from work in hazardous waste operations or emergency response, or from respirator use.

B. The physician's recommended limitations upon the employee's assigned work assignment.

C. A statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions which require further examination or treatment

The written opinion obtained by the employer shall not reveal specific findings or diagnoses unrelated to occupational exposures.

The physician shall provide the results of the medical examination and tests to the employee if requested.

The City's Human Resources Department shall maintain an accurate record of required medical surveillance. This record shall be retained for the length of the employee's career plus 30 years and shall include at least the following information:

A. The name and social security number of the employee.

B. Physician's written opinions, recommended limitations, and results of examinations and tests.

C. Any employee medical complaints related to exposure to hazardous substances.

D. A copy of the information provided to the examining physician by the employer, with the exception of the standard and its appendices.

Appendix I

Engineering and Administrative Controls

Engineering controls, work practices, and personal protective equipment – or a combination of these – shall be implemented in department/division policies to protect employees from exposure to hazardous substances and from safety and health hazards.

Work practices may include, but are not limited to, the removal of all non-essential employees from potential exposure during the opening of drums, the wetting down of dusty operations, and locating employees upwind of possible hazards. A Safety Officer shall be contacted relative to compliance with PELs.

Departments/divisions shall use the published literature and Material Safety Data Sheets as a guide in making a determination as to what level of protection is appropriate for hazardous substances and health hazards for which there is no PEL or published exposure level.

PPE shall be selected and used that will protect employees from the hazards and potential hazards that they are likely to encounter as identified during the site characterization and analysis. PPE selection shall also be based upon an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the site, the task-specific conditions and duration, and the hazards and potential hazards identified at the site.

Positive pressure self-contained breathing apparatus or positive pressure airline respirators equipped with an escape air supply shall be used when chemical exposure levels present will create a substantial possibility of immediate death, immediate serious illness or injury, or impair the ability to escape.

The level of protection provided by PPE selection shall be increased when additional information on site conditions shows that increased protection is necessary to reduce employee exposures below established PELs or published exposure levels for hazardous substances and health hazards.

Departments/divisions shall develop and enforce a written PPE program as a part of the site-specific safety and health plan. The PPE program shall address the elements listed below. When elements, such as donning and doffing procedures, are provided by the manufacturer of a piece of equipment and are attached to the plan, they need not be rewritten into the plan as long as they adequately address the procedure or element.

A. PPE selection based upon site hazards,

B. PPE use and limitations of the equipment,

C. Work mission duration,

D. PPE maintenance and storage,

E. PPE decontamination and disposal,

F. PPE training and proper fitting,

G. PPE donning and doffing procedures,

H. PPE inspection procedures prior to, during, and after use,

I. Evaluation of the effectiveness of the PPE program, and

J. Limitations during temperature extremes, heat stress, and other appropriate medical considerations.

In selecting the correct PPE, Level B PPE should be used when:

A. The type and atmospheric concentration of substances have been identified and require a high level of respiratory protection, but less skin protection; and/or

B. The atmosphere contains less than 19.5% oxygen; or

C. The presence of incompletely identified vapors or gases is indicated by a direct-reading organic vapor detection instrument, but vapors and gases are not suspected of containing high levels or chemicals harmful to skin or capable of being absorbed through the skin.

The following constitutes Level B equipment and shall be used as appropriate:

A. Positive-pressure, fullface-piece, self-contained breathing apparatus (SCBA), or positive-pressure supplied-air respirator with escape SCBA (NIOSH approved).

B. Hooded chemical-resistant clothing (overalls and long-sleeved jacket; chemical splash suit; disposable chemical-resistant overalls).

C. Coveralls (optional, as applicable)

D. Chemical-resistant outer gloves.

E. Chemical-resistant inner gloves.

F. Chemical-resistant steel toe and shank outer boots.

G. Chemical-resistant inner toe and shank outer boot-covers (optional, as applicable).

H. Hard hat (optional, as applicable).

I. Face shield (optional, as applicable).

In the absence of a specific department/division program, the respective department/division

shall comply with applicable City-wide policies.

Appendix J

Monitoring

Monitoring shall be performed where there may be a question of employee exposure to hazardous concentrations of hazardous substances in order to assure proper selection of engineering controls, work practices, and PPE so that employees are not exposed to levels that exceed PELs or published exposure levels for hazardous substances.

Air monitoring shall be used to identify and quantify airborne levels of hazardous substances, and health and safety hazards in order to determine the appropriate level of employee protection needed on site. Upon initial entry, representative air monitoring shall be conducted when the possibility of an IDLH condition of flammable atmosphere has developed or when there is indication that exposures may have risen over PELs or published exposure levels, exposure over a radioactive material's dose limit, or other dangerous situations such as the presence of flammable atmospheres or oxygen-deficient environments.

Periodic monitoring shall be conducted when the possibility of an IDLH condition or flammable atmosphere has developed or when there is indication that exposures may have risen above PELs or published exposure levels since prior monitoring. Situations where it shall be considered whether the possibility that exposures have risen are as follows:

A. When work begins on a different portion of the site.

B. When contaminants other than those previously identified are being handled.

C. When a different type of operation is initiated (e.g., drum opening as opposed to contaminated soil removal)

D. When employees are handling leaking drums or containers or working in areas with obvious liquid contamination (e.g., a spill).

After the actual clean-up phase of any hazardous waste operation commences – for example, when soil, surface water or containers are moved and disturbed – the employer shall monitor those employees likely to have had the highest exposures to hazardous substances and health hazards likely to be present above PELs or published exposure levels by using personal sampling frequently enough to characterize employee exposures. If the employees likely to have the highest exposure are over PELs or published exposure levels, then monitoring shall continue in order to identify all employees likely to be above those limits. Departments/divisions may utilize a representative sampling approach by documenting that the employees and chemicals chosen for monitoring are based on the criteria stated above.

Appendix K

Informational Programs

Departments/divisions shall develop and implement a program to inform employees, contractors, and subcontractors (or their representatives) actually engaged in hazardous waste operations of the nature, level, and degree of exposure likely as a result of participation in such hazardous waste operations. Employees, contractors, and subcontractors working outside of the operations part of a site are not covered by this regulation.

Appendix L

Handling Drums and Containers

Drums and containers used during clean-up operations shall meet the appropriate U.S. Department of Transportation, OSHA, and EPA regulations for the wastes that they contain. When practical, drums and containers shall be inspected and their integrity assured prior to being moved. Drums or containers that cannot be inspected before being moved because of storage conditions (i.e., buried beneath the earth, stacked behind other drums, stacked several tiers high, etc.), shall be moved to an accessible location and inspected prior to further handling. Unlabeled drums and containers shall be considered to contain hazardous substances and handled accordingly until the contents are positively identified and labeled.

Site operations shall be organized to minimize the amount of drum or container movement. Prior to movement of drums or containers, all employees exposed to the transfer operation shall be warned of the potential hazards associated with the contents of the drums or containers. Material handling equipment used to transfer drums and containers shall be selected, positioned, and operated to minimize sources of ignition related to the equipment from igniting vapors released from ruptured drums and containers.

Drums and containers shall be identified and classified prior to packaging for shipment. Drum or container staging areas shall be kept to the minimum number necessary to safely identify and classify materials and prepare them for transport. Such staging areas shall be provided with adequate access and egress routes. Bulking of hazardous wastes shall be permitted only after a thorough characterization of the materials has been completed.

Drums and containers containing radioactive wastes shall not be handled until such time as their hazard to employees is properly assessed.

U.S. Department of Transportation specified salvage drums or containers and suitable quantities of proper absorbent shall be kept available and used in areas where spills, leaks, or ruptures may occur. Where major spills may occur, a spill containment program shall be implemented to contain and isolate the entire volume of the hazardous substance being transferred. Drums and containers that cannot be moved without rupture, leakage, or spillage shall be emptied into a sound container using a device classified for the material being transferred.

A ground-penetrating system or other type of detection system or device shall be used to estimate the location and depth of buried drums or containers. Soil or covering material shall be removed with caution to prevent drum or container rupture.

Fire extinguishing equipment, as specified adequate by the Uniform Fire Code, shall be on hand and ready for use to control incipient fires.

The following procedures shall be followed in areas where drums or containers are being opened:

A. Where an airline respirator system is used, connections to the bank of air cylinders shall be protected from contamination and the entire system shall be protected from physical

damage.

B. Employees not actually involved in opening drums or containers shall be kept a safe distance from the drums or containers being opened.

C. If employees must work near or adjacent to drums or containers being opened, a suitable shield that does not interfere with the work operation shall be placed between the employee and the drums or containers being opened to protect the employee in case of accidental explosion.

D. Controls for drum or container opening equipment, monitoring equipment, and fire suppression equipment shall be located behind the explosion-resistant barrier.

E. When there is a reasonable possibility of flammable atmosphere being present, material handling equipment and hand tools shall be of the type to prevent sources of ignition.

F. Drums and containers shall be opened in such a manner that excess interior pressure will be safely relieved. If pressure cannot be relieved from a remote location, appropriate shielding shall be placed between the employee and the drums or containers to reduce the risk of employee injury.

G. Employees shall be instructed not to stand or work from drums or containers.

Lab packs shall be opened only when necessary and then only by an individual knowledgeable in the inspection, classification, and segregation of the containers within the pack according to the hazards of the wastes. If crystalline material is noted on any container, the contents shall be handled as a shock-sensitive waste until its contents are identified.

Sampling of containers and drums shall be done in accordance with a sampling procedure that is part of the site safety and health plan developed for and available to employees and others at the specific worksite.

Tanks and vaults containing hazardous substances shall be handled in a manner similar to that for drums and containers, taking into consideration the size of the tank or vault. Refer to the site-specific safety and health plan and to the Confined Space policy in the Safety and Health Policies and Procedures Manual relative to entry procedures.

Appendix M

Decontamination

Each affected department/division shall develop a decontamination procedure, to be communicated to employees, and implemented, before any employees or equipment may enter areas on site where potential for exposure to hazardous substances exists. Standard operating procedures shall be developed to minimize employee contact with hazardous substances or with equipment that has contacted hazardous substances.

All employees leaving a contaminated area shall be appropriately decontaminated; all contaminated clothing and equipment leaving a contaminated area shall be appropriately disposed of or decontaminated, cleaned, laundered, or maintained as needed to ensure effectiveness. Commercial laundries or cleaning establishments that decontaminate protective clothing or equipment shall be informed of the potentially harmful effects of exposures to hazardous substances. Employees whose non-impermeable clothing becomes wet with hazardous substances shall immediately remove that clothing and proceed to shower. The clothing shall be disposed of or decontaminated before it is removed from the work zone. The site safety and health supervisor shall monitor decontamination procedures to determine their effectiveness. When such procedures are found to be ineffective, appropriate steps shall be taken to correct any deficiencies.

Unauthorized employees shall be instructed not to remove protective clothing or equipment from change rooms.

Decontamination shall be performed in geographical areas that minimize the exposure of uncontaminated employees or equipment to contaminated employees or equipment. All equipment and solvents used for decontamination shall be decontaminated or disposed of properly.

Appendix N

Emergency Response By Employees At Uncontrolled Hazardous Waste Sites And At Hazardous Substance Releases

Each affected department/division shall develop and implement its own written emergency response plan to address anticipated emergencies prior to the commencement of hazardous waste operations or of emergency response operations. This plan shall be a separate section of the site safety and health plan and shall be compatible and integrated with the disaster, fire, and emergency response plans of local, state, and federal agencies. Each emergency response plan must be available for inspection and copying by employees, their representatives, and other governmental agencies with relevant responsibilities.

Each department/division emergency response plan shall address, as a minimum, the following:

A. Pre-emergency planning

B. Personnel roles, lines of authority, and communication

C. Emergency recognition and prevention

D. Safe distances and places of refuge

E. Site security and control

F. Evacuation routes and procedures

G. Decontamination procedures that are not covered by the site safety and health plan

H. Emergency medical treatment and first aid

I. Emergency alerting and response procedures

J. Critique of response and follow-up

K. Personal protective equipment (PPE) and emergency equipment

L. Site topography, layout, and prevailing weather conditions

M. Procedures for reporting incidents to local, state, and federal agencies.

Emergency response plans shall be rehearsed regularly as part of the overall training program for site operations.

Emergency response plans shall be reviewed periodically and, as necessary, be amended to keep current with new or changing site conditions or information.

The procedures for handling an emergency response are:

A. The senior emergency response official with ultimate site control responsibility shall confirm that the Incident Command System (ICS) is in place and the position of Incident Commander (IC) instituted.

B. The individual in charge of the ICS shall identify, to the extent possible, all hazardous substances or conditions present and shall address, as appropriate, site analysis, use of engineering controls, maximum exposure limits, hazardous substance handling procedures, and use of any new technologies.

C. Based upon the hazardous substances and/or conditions present, the individual in charge of the ICS shall implement appropriate emergency operations, and assure that PPE worn is appropriate for the hazards present.

D. Employees engaged in emergency response and exposed to hazardous substances presenting an inhalation hazard or potential inhalation hazard shall wear positive pressure self-contained breathing apparatus (SBCA) while engaged in emergency response, until such time that the individual in charge of the ICS determines through the use of air monitoring that a decreased level of respiratory protection will not result in hazardous exposures to employees.

E. The individual in charge of the ICS shall limit the number of emergency response personnel at the emergency site in those areas of potential or actual exposure to incident or site hazards, to those who are actively performing emergency operations. However, operations in hazardous areas shall be performed using the buddy system in groups of two or more.

F. Back-up personnel shall stand by with equipment ready to provide assistance or rescue, and shall not engage in activities that will detract from that mission. Back-up personnel shall be protected, at a minimum, at the same level as the entry team. Advance first aid support personnel, at a minimum, shall also stand by with medical equipment and transportation capability.

G. The individual in charge of the ICS shall designate a safety official, who is knowledgeable in the operations being implemented at the emergency response site, and with specific responsibilities to identify and evaluate hazards and to provide direction with respect to the safety of operations for the emergency at hand.

H. When activities are judged by the safety official to be an IDLH condition and/or to involve an imminent danger condition, the safety official shall have the authority to alter, suspend, or terminate, those activities. The safety official shall immediately inform the individual in charge of the ICS of any actions required to correct these hazards.

I. After emergency operations have terminated, the individual in charge of the ICS shall implement appropriate decontamination procedures.

J. When deemed necessary for meeting the tasks at hand, approved SCBA may be used with approved cylinders from other approved SCBA, provided that such cylinders are of the same capacity and pressure rating. All compressed air cylinders used with SCBA shall meet U.S. Department of Transportation (DOT) and National Institute for

Occupational Safety and Health (NIOSH) criteria.

Personnel, not necessarily City employees, who are skilled in the operation of certain equipment, such as mechanized earth moving or digging equipment or crane and hoisting equipment, and who are needed temporarily to perform immediate emergency support work that cannot be reasonably performed in a timely fashion by the department/division's own employees, and who will or may be exposed to the hazards at the emergency response scene, are not required to meet the training required for the department/division's regular employees. Such personnel, however, shall be given an initial briefing at the site prior to their participation in any emergency response. This initial briefing shall include instruction in the wearing of appropriate PPE, in the chemical hazards involved, and in the duties to be performed. All other appropriate safety and health precautions provided to the department/division's own employees shall be used to assure the safety and health of these support personnel.

Employees who, in the course of their regular job duties, work with and are trained in the hazards of the specific hazardous substances, and who will be called upon to provide technical advice or assistance at a hazardous substance release incident, shall receive training or demonstrate competency in the area of their specialization annually.

Training shall be based upon the duties and function to be performed by each responder. The skill and knowledge levels required for all new responders shall be conveyed to them through training before they are permitted to take part in actual emergency operations. Employees who participate, or are expected to participate, in emergency response, shall be given training in accordance with the following standards:

A. First Responder, Awareness Level: These are individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. They take no further action. First responders at the awareness level shall have sufficient training or have had sufficient experience to objectively demonstrate competency in the following areas:

1. An understanding of hazardous substances, and the risks associated with them.
2. An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.
3. The ability to recognize the presence of hazardous substances in an emergency.
4. The ability to identify the hazardous substances, if possible.
5. An understanding of the role of the first responder awareness individual in the employer's emergency response plan (including site security and control) and in the U.S. Department of Transportation's Emergency Response Guidebook.
6. The ability to realize the need for additional resources and to make appropriate notifications.

B. First Responder, Operations Level: These are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment form the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop the release. The function is to contain the release from a safe distance, keep it from spreading, and prevent exposures. First responders at the operational level shall

have received at least eight hours of training or have had sufficient experience to objectively demonstrate competency in the following areas in addition to those listed for the awareness level, and the department/division shall so certify:

1. Knowledge of the basic hazard and risk assessment techniques.
2. Knowledge of how to select and use proper PPE.
3. An understanding of basic hazardous materials terms.
4. Knowledge of how to perform basic control, containment, and/or confinement operations and rescue injured or contaminated persons within the capabilities of the resources and PPE available.
5. Knowledge of how to implement basic equipment, victim and rescue personnel decontamination procedures.
6. An understanding of the relevant standard operating procedures and termination procedures.

C. Hazardous Materials Technician: These are individuals who respond to releases or potential releases of hazardous substances for the purpose of stopping the release. They assume a more aggressive role than a first responder at the operations level in that they will approach the point of release in order to plug, patch, or otherwise stop the release of a hazardous substance. Hazardous materials technicians shall have received at least 24 hours of training of which 8 hours shall be equivalent to the first responder operations level and in addition have competency in the following areas, and the department/division shall so certify:

1. Knowledge of how to implement the employer's emergency response plan.
2. Knowledge of the classification, identification, and verification of known and unknown materials by using field survey instruments and equipment.
3. Ability to function with an assigned role in the ICS.
4. Understanding of hazard and risk assessment techniques.
5. Knowledge of how to select and use proper specialized chemical PPE provided to the hazardous materials technician.
6. Ability to perform advanced control, containment, and/or confinement operations and rescue injured or contaminated persons within the capabilities of the resources and PPE available with the unit.
7. Understanding of and ability to implement equipment, victim, and rescue personnel decontamination procedures.
8. Understanding of termination procedures.
9. Understanding of basic chemical and toxicological terminology and behavior.

D. Hazardous Materials Specialist: These are individuals who respond with and provide support to hazardous materials technicians. Their duties parallel those of hazardous materials technicians, however, those duties require a more directed or specific knowledge of the various substances that they may be called upon to contain. The hazardous materials specialist is also the site liaison with Federal, state, local, and other government authorities in regards to site activities. Hazardous materials specialists shall have received at least 24 hours of training equal to the technician level and have additional competency in the following areas, and the department/division shall so certify:

1. Knowledge of how to implement the local emergency response plan
2. Understanding of the classification, identification, and verification of known and unknown materials by using advanced survey instruments and equipment.
3. Knowledge of the state emergency response plan.
4. Ability to select and use proper specialized chemical PPE provided to the hazardous materials specialist.
5. In-depth understanding of hazard and risk techniques.
6. Ability to perform specialized control, containment, and/or confinement operations within the capabilities of the resources and PPE available.
7. Ability to determine and implement decontamination procedures.
8. Ability to develop a site safety and health control plan
9. Understanding of chemical, radiological, and toxicological terminology and behavior.

E. Incident Commander/On-scene Manager: Incident commanders, who will assume control of the incident scene beyond the first responder awareness level, shall receive at least 24 hours of training equal to the first responder operations level and, in addition, have competency in the following areas, and the department/division shall so certify:

1. Knowledge of and ability to implement the department/division's incident command system.
2. Knowledge and understanding of the hazards and risks associated with employees working in chemical protective clothing.
3. Knowledge of how to implement the department/division's emergency response plan.
4. Knowledge of how to implement the local emergency response plan.
5. Knowledge of the state emergency response plan and of the Federal Regional Response Team.
6. Knowledge and understanding of the importance of decontamination procedures.

First responders and incident commanders shall receive annual refresher training of sufficient content and duration to maintain their competencies, or shall demonstrate competency in those areas at least yearly. The department/division shall keep a record of the methodology used to demonstrate competency.

Based upon the information available at time of the emergency, the employer shall evaluate the incident and the site response capabilities and proceed with the appropriate steps to implement the emergency response plan.

Certain locations will require an employee alarm system to be installed to notify employees of an emergency situation, to stop work activities if necessary, to lower background noise in order to speed communication, and to begin emergency procedures. Departments/divisions shall consult with the City Safety Officer in the preparation of an emergency response plan to determine if the affected site requires an alarm.

Appendix O

Illumination

Areas accessible to employees shall be lit to not less than the following minimum illumination intensities while work is in progress:

Foot Candles	*Area or Operations*
5	General site areas
3	Excavation and waste areas, accessways, active storage areas, loading platforms, refueling, and field maintenance areas
5	Indoors: Warehouses, corridors, hallways, and exitways
5	Tunnels, shafts, and general underground work areas
10	General shops (e.g., mechanical and electrical equipment rooms, active storerooms, barracks or living quarters, locker or dressing rooms, dining areas, and indoor toilets and workrooms)
30	First aid stations, infirmaries, and offices

Appendix P

Sanitation At Temporary Workplaces

Potable Water

An adequate supply of potable water shall be provided on site. Portable containers used to dispense drinking water shall be capable of being tightly closed and equipped with a tap, and shall be otherwise designed, constructed, and serviced so that sanitary conditions are maintained. Water shall not be dipped from containers. Any container used to store, dispense, or distribute drinking water shall be clearly marked as to the nature of its contents and shall not be used for any other purpose.

Where single service cups (to be used only once) are supplied, both a sanitary container for the unused cups and a receptacle for disposing the used cups shall be provided.

Nonpotable Water

Sources for nonpotable water, such as water for industrial or firefighting purposes, shall be identified to indicate clearly that the water is unsafe and not to be used for drinking, washing, or cooking purposes.

There shall be no cross-connection, open or potential, between a system furnishing potable water and a system furnishing nonpotable water.

Toilet Facilities

A minimum of one separate toilet facility shall be provided for each 20 employees or fraction thereof of each sex. Such facilities may include both toilets and urinals provided that the number of toilets shall not be fewer than one-half the minimum required for required number of facilities. An exception exists in instances where there are fewer than 5 employees, in which case separate toilet facilities can be locked from the inside and contain at least one toilet.

Under temporary field conditions, provisions shall be made to assure that at least one toilet facility is available. Hazardous waste sites not provided with a sanitary sewer shall be provided with chemical toilets. The requirement for on-site toilet facilities shall not apply to crews having transportation readily available to nearby toilet facilities.

Doors entering toilet facilities shall be provided with entrance locks controlled from inside the facility. Toilet facilities shall be kept clean, maintained in good working order, and provided with an adequate supply of toilet paper.

Washing Facilities

Affected departments/divisions shall provide adequate washing facilities for employees engaged in operations where hazardous substances may be harmful to employees. Such facilities shall be in near proximity to the worksite; in areas where exposures to PELs and published exposure levels and which are under the control of the employer; and shall be so equipped as to enable employees to remove hazardous substances from themselves.

Appendix Q

New Technology Programs

Affected departments/divisions shall develop and implement procedures for the introduction of effective new technologies and equipment developed for the improved protection of employees working with hazardous waste clean-up operations, and the same shall be implemented as part of a site safety and health program to assure that employee protection is being maintained.

New technologies, equipment, or control measures available to the industry, such as the use of foams, absorbents, adsorbents, neutralizers, or other means to suppress the level of air contaminants while excavating the site or for spill control, shall be evaluated by departments/divisions. Such evaluation shall be done to determine the effectiveness of the new methods, materials, or equipment before implementing their use on a large scale for enhancing employee protection. Information and data from manufacturers or suppliers may be used as part of the employer's evaluation effort.

City of Riverside
Safety and Health Policies and Procedures Manual

Effective Date: 06/2008
Review Date: 06/2010
Prepared by: City Manager/Finance

Approved:

Department

City Manager

SUBJECT:

Hazardous Materials Storage and Use

PURPOSE:

This policy establishes the minimum requirements for the safe storage and use of hazardous materials. The Hazardous Materials Storage and Use Policy is an element in the City's Injury and Illness Prevention Plan (Safety and Health Policies and Procedures Manual, Section I - 001) and enables the City to comply with the requirements of California Code of Regulations (CCR), Title 8, Sections 3220, 5162, 5163, 5164, 5165, 5166, 5167, 5168, 5185, 5189, and 5191.

POLICY:

The safety and health of every City employee is of primary importance. This policy establishes the responsibilities and procedures of all affected City employees relative to the safe storage and use of hazardous materials. All levels of management shall work within their own departments/divisions to ensure that employees are trained in the safe storage and use of hazardous materials.

The responsibility for seeing that this policy and its associated procedures are followed is binding upon all authorized and affected employees. Affected employees subject to the requirements of this policy and to training on their duties within it include, but are not limited to, those individuals whose job duties require working with or in the proximity of known or potentially hazardous materials. Employees who do not work with such materials, but whose responsibilities may reasonably place them in occasional proximity to them, shall be considered "Other Use Employees" and shall be trained on the recognition of hazardous and potentially hazardous materials; on general precautions regarding their use, safe storage, and proximity; and, on the purpose of this policy.

In addition to the requirements defined in this policy and its appendices, the Public Works Department's Sewerage Systems Division and the Public Utilities Department's Water Operations Division shall also comply with the requirements of the California Code of Regulations, Title 8, Section 5189 and each shall develop a process safety management plan for the use of gaseous chorine, the Sewerage Systems and the Police Evidence laboratories shall also comply with the requirements of California Code of Regulations, Title 8, Section 5191, Occupation Exposure to Hazardous Chemicals in Laboratories. Compliance requires a written Chemical Hygiene Plan (Laboratory Safety Plan). Each laboratory shall develop its own plan.

This policy, with its appendices, sets mandatory standards for behavior. Management and Supervision are responsible for ensuring that all elements of this program are implemented and shall enforce its requirements. Discipline for non-compliance shall be in accordance with the Human Resources Policy and Procedures Manual, Section III – 1.

PROCEDURE:

Responsibility	Action
City Manager	1. Implement the City policy for hazardous materials storage and use.
	2. Ensure that department heads are held responsible and accountable for the performance and actions of their departments/divisions relative to the safe storage and use of hazardous materials.
Department Heads	3. Periodically review the requirements of the hazardous materials storage and use policy with Division Heads and Supervisors and document that review.
Division Heads/Supervisors	4. Evaluate the workplace to identify all hazardous materials to which employees might reasonable be exposed.
	5. Identify, by job classification, those individuals who are either authorized or affected employees in accordance with this policy.
	6. Ensure that all employees receive training, suitable to need, on the hazardous materials storage and use policy.
	7. Ensure that all training records, with dates and original signatures for all employers and trainers, are maintained.
	8. Ensure that all requirements of the hazardous materials storage and use policy are followed.
	9. Ensure that an accurate inventory of hazardous chemicals is maintained at the storage locations and that a copy is provided to the Safety Officer.
	10. Ensure that any chemical storage that requires inclusion in a Business Emergency Plan is incorporated into such a plan and that the plan is submitted to the Riverside Fire Department.
All City Employees	11. Follow all applicable requirements for hazardous materials storage and use.
Safety Officer	12. Assist in coordinating training.
	13. Maintain master inventory of hazardous materials stored and used by City departments/divisions.
	14. Monitor effectiveness of the hazardous materials storage and use policy and provide amendments as necessary.
	15. Review policy for effectiveness every two years.

Attachments:

1. Appendix A – Definition of Terms
2. Appendix B – General Requirements for the Storage and Use of Hazardous Materials
3. Appendix C – Changing and Charging of Storage Batteries
4. Appendix D – Emergency Eyewash and Shower Equipment
5. Appendix E – List of Acutely Hazardous Chemicals, Toxics and Reactives

Appendix A

Definition of Terms

Action Level – A concentration designated in Title 8, California Code of Regulations, for a specific material, calculated as an eight (8)-hour time weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance.

Acutely Hazardous Material – A material possessing toxic, reactive, flammable, or explosive properties.

Closed – As applied to containers, closed means vapor-tight.

Combustible Liquid – Any liquid having a flash point at or above 100 F (37.8 C), but below 200 F (93.3 C), except any mixture having components with flashpoints of 200 F (93.3 C) or higher, the total volume of which makes up 99 percent or more of the total volume of the mixture.

Combustible Material – Any material that, after ignition, will continue to burn in air.

Container – Any tank, vat, drum, or other vessel in which a material is placed for storage, use, processing, or transportation, but the term excludes underground storage tanks, all pipelines, and all highway and air-borne transportation vehicles and equipment.

Corrosive – A liquid or solid that causes visible destruction or irreversible alterations in human skin tissue at the site of contact.

Covered – As applied to containers, covered means providing with a closure that will not normally prevent spillage or splashing or contents, but is not necessarily liquid or vapor tight; approved safety cans will be considered covered containers. Equipment listed by the Underwriters' Laboratories or bearing the approval label of other testing laboratories will be acceptable under this definition.

Drum – A portable metal container or barrel, provided with removable plugs or other means by which it can be closed; and having a capacity not less than 15 U.S. gallons nor more than 110 U.S. gallons, but the term does not include fuel tanks or other equipment on highway or air-borne transportation vehicles.

Explosive – A material identified in Title 49, Part 172 of the Code of Federal Regulations.

Facility – The buildings, containers, or equipment that contain a process.

Flammable – A liquid that has a flash point below 100 F (37.8 C).

Hazardous Material – A substance, material, or mixture that, by reason of being explosive, flammable, poisonous, corrosive, oxidizing, an irritant, or otherwise harmful, is likely to cause injury or illness. Hazardous materials includes hazardous waste as defined in the City's Hazardous Waste Operations and Emergency Response Policy, Safety and Health Policies and Procedures Manual, VI – 02.

Hot Work – Any construction, alteration, repair, or demolition involving welding, burning, or similar fire-producing operations. Grinding, drilling, sand or shot blasting, or similar spark-producing operations shall be considered hot work, except when circumstances do not necessitate such classification, i.e., there are no flammable materials present that could be ignited by a spark.

Irritant – A material that can cause an inflammatory response or reaction in the eyes, the skin, or the respiratory system.

Laboratory – A generally recognized subdivision of a plant where the primary purpose is testing, analysis, or inspection.

Major Accident – Any event involving fire, explosion, or release of a material that results in a fatality or a serious injury to persons in the workplace.

Normally Unoccupied Remote Facility – A facility operated, maintained, and serviced by employees who visit the unmanned facility only periodically to check its operation and perform necessary operating or maintenance tasks. No employees are permanently stationed at this facility. Facilities meeting this definition are not contiguous with, and must be geographically remote from, all other buildings, processes and persons.

Process Safety Management – The application of management programs, which are not limited to engineering guidelines, when dealing with the risks associated with handling or working near acutely hazardous materials, flammables, or explosives.

Replacement In Kind – A replacement that satisfies the design specification.

Open – As applied to containers, open means not covered or closed.

Oxidizer – A material other than a blasting agent or explosive that initiates or promotes combustion in other materials, thereby causing fire, either of itself or through the release of oxygen or other gases.

Poison – A material that, when taken in small quantities or low concentrations by mouth, inhaled, or absorbed through the skin rapidly jeopardizes life by other than mechanical or physical action.

Reproductive Toxins – Chemicals that affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis).

Select Carcinogen – Any material that meets one of the following criteria:

(A) It is regulated by Cal/OSHA as a carcinogen; or

(B) It is listed under the category, "known to be carcinogens" in the Annual Report on Carcinogens published by the National Toxicology Program (1985 edition); or

(C) It is listed under Group 1 ("carcinogenic to humans") by the International Agency for Research on Cancer Monographs (Volumes 1–48 and Supplements 1-8); or

(D) It is listed in either Group 2A or 2B by the International Agency for Research on Cancer Monographs or under the category, "reasonably anticipated to be carcinogens" by the National Toxicology Program, and causes statistically significant tumor incidence in experimental animals in accordance with the following criteria:

(1) After inhalation exposure of 6-7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m3;

(2) After repeated skin application of less than 300 mg/kg of body weight per week; or

(3) After oral dosages of less than 50 mg/kg of body weight per day.

Station – A building, room, or section of a room in which a specific operation or part of a process is performed.

Appendix B

General Requirements for the Storage and Use of Hazardous Materials

Storage of Hazardous Materials

Materials that, when mixed, react violently, or evolve toxic vapors or gases, or which, in combination, become hazardous by reason of toxicity, oxidizing power, flammability, explosibility, or other properties, shall be evaluated for compatibility before storing. Incompatible materials shall be separated from each other in storage by distance, or by partitions, or otherwise, so as to preclude accidental contact between them. Some typical examples of such incompatible materials are oxidizing agents and combustible materials; acids and alkalis. Refer to label information and Material Safety Data Sheets.

Hazardous materials shall be stored in containers, such as those approved by the U.S. Department of Transportation, that are chemically inert to and appropriate for the type and quantity of the hazardous material.

Containers of hazardous materials shall not be stored in such locations or a manner as to result in physical damage to, or deterioration of, the container. Containers shall not be stored where they are exposed to heat sufficient to rupture the containers or to cause leakage.

Depending upon the material, it may be necessary to store specific hazardous material on leak containment pallets or within hazardous materials cabinets. Consult Safety Officer relative to storage requirements for specific hazardous materials.

Containers used to package a material that gives off toxic, poisonous, corrosive, asphyxiant, suffocant, or anesthetic fumes, gases, or vapors in hazardous amounts (e.g., chlorine, or other compressed or liquefied toxic gases) shall not be stored in locations where it could be reasonably anticipated that employees would be exposed. This requirement does not apply to small quantities of such materials kept in closed containers.

Containers shall be labeled to identify contents using the most effective means possible; e.g., permanent marker, gummed label, etc. The label shall identify the chemical contained.

Dispensing Devices for Hazardous Materials

Carboys and drums shall not be emptied by air pressure greater than atmospheric pressure except as produced by hand pumps or bulbs.

Cleaning, Repairing, or Altering Containers

Departments/divisions shall provide specific information regarding safe procedures and other precautions before cleaning or subsequent use or disposal of a container. Departments/divisions shall ensure that these procedures and precautions are followed.

No welding, cutting, or other hot work shall be performed on used drums, barrels, tanks, or other containers until they have been cleaned so thoroughly as to make absolutely certain that there are no flammable materials present or any materials such as greases, tars, acids, or other materials that, when subjected to heat, might produce flammable or toxic vapors. Any pipelines or connections to the drum or vessel shall be disconnected or blanked.

Equipment and Processes Involving Hazardous Materials

Whenever it is necessary to agitate or mix one or more hazardous materials that splatter, splash, spray, boil-over, or create temperature extremes on being mixed, employees shall be protected from harmful contact or exposure by shielding or other means appropriate to the hazards presented.

Controls shall be so located that any employee operating them shall not be exposed to or come into contact with the hazardous material.

Static Electricity

Nozzles for air, inert gas, and steam lines or hoses, when used in the cleaning or ventilation of tanks and vessels that may contain hazardous concentrations of flammable gases or vapors, shall be bonded to the tank or vessel shell. Bonding devices shall be neither attached nor detached in hazardous concentrations of flammable gas or vapors.

Bonding and grounding devices that are temporarily clamped or clipped to movable equipment shall have a conductor of ample length to assure the effective attachment of the device.

When attaching bonding and grounding clamps or clips, a secure and positive metal-to-metal contact shall be made. Such attachments shall be made before closures are opened and material movements are started and shall not be broken until after material movements are stopped and closures are made.

Spill and Overflow Control

Where a corrosive material is handled in an open container, safe means shall be taken to neutralize or dispose of spills or overflows promptly.

Where an oxidizer may be spilled on wooden floors, benches, or other combustible material, safe means shall be available and used to effectively remove the oxidizing material. If a solution of an oxidizing agent or a liquid oxidizing agent is spilled on wooden floors or benches, the contaminated area shall be thoroughly flushed with water. Combustible waste material contaminated with such oxidizing agents shall be disposed of in a prompt and safe manner.

Appendix C

Changing and Charging of Storage Batteries

Battery charging installations shall be located in areas designated for that purpose. Employees assigned to work with storage batteries shall be instructed in such emergency procedures as neutralizing and cleaning up accidental acid spills.

The area shall be adequately ventilated to prevent concentrations of flammable gases from exceeding 20% of the lower explosive limit, and to prevent harmful concentration of mist from the electrolyte.

Carboy tilter, siphon, hand-operated bulb or hand-operated pump shall be provided and used for dispensing electrolyte or acid.

Facilities shall be provided for protecting charging apparatus from damage by mobile equipment.

Appropriate mechanical lifting and material handling devices or equipment shall be provided for handling batteries.

Smoking shall be prohibited in the charging area.

Precautions shall be taken to prevent open flames, sparks, or electric arcs in battery charging areas. When racks are used for support of batteries, they shall be made of materials nonconductive to spark generation or coated or covered to achieve this objective. Tools and other metallic objects shall be kept away from the top of uncovered batteries. Chargers shall be turned off when leads are being connected or disconnected.

Electrolyte (acid or base, and distilled water) for battery cells shall be mixed in a well-ventilated room. Acid or base shall be poured gradually into the water while stirring. Water shall never be poured into concentrated (greater than 75%) acid solutions.

Mobile equipment shall be properly positioned and the brake applied before attempting to change or charge batteries.

When charging batteries, vent caps shall be kept firmly in place to avoid electrolyte spray. Care shall be taken to assure that vent caps are functioning. The battery compartment cover(s) shall be open to dissipate heat.

Facilities for quick drenching or flushing of the eyes and body shall be provided. (See Appendix D)

Electrolyte shall only be placed in suitable containers and shall not be stirred with metal objects.

When a jumper battery is connected to a battery in a vehicle, the ground lead shall connect to ground away from the vehicle's battery. Ignition, lights and accessories on the vehicle shall be turned off before connections are made.

Vent caps shall be in place when batteries are being moved.

Appendix D

Emergency Eyewash and Shower Equipment

Plumbed or self-contained eyewash or eye/facewash equipment which meets the requirements of sections 5, 7, or 9 of ANSI Z358.1-1981, Emergency Eyewash and Shower Equipment, shall be provided at all work areas where, during routine operations or foreseeable emergencies, the eyes of the employee may come into contact with a material that can cause corrosion, severe irritation, or permanent tissue damage, or which is toxic by absorption. Water hoses, sink faucets, or showers are not acceptable eyewash facilities.

An emergency shower that meets the requirements of section 4 or 9 of ANSI Z358.1.1981 shall be provided at all work areas where, during routine operations or foreseeable emergencies, an area of the body may come into contact with a material that is corrosive or severely irritating to the skin or that is toxic by skin absorption.

Emergency eyewash facilities and deluge showers shall be in accessible locations that require no more than 10 seconds for the injured person to reach. If both an eyewash and shower are needed, they shall be located in a manner that allows both to be used at the same time by one person. The area of the eyewash and shower equipment shall be maintained free of items that obstruct their use.

Plumbed eyewash equipment shall supply potable water at 2.4 gallons of water per minute, 15 p.s.i. Plumbed drench shower equipment shall supply potable water at no less than 20 gallons of water per minute, 30 p.s.i. Self-contained eyewash equipment shall supply potable water or other eye-flushing solution approved by a consulting physician at .4 gallons per minute for 15 minutes. Potable water in self-contained eyewash equipment shall be treated with a water preservative to prevent the growth of bacteria. Control valves shall be designed so that water flow remains on without requiring the use of the operator's hands, and so that the valve remains activated until intentionally shut off.

Plumbed and self-contained eyewash and shower equipment shall be activated at least monthly to flush the line and to verify proper operation. Attached inspection tags shall be marked to indicate the date of inspections and the identity of inspectors.

Appendix E

List of Acutely Hazardous Chemicals, Toxics and Reactives

See the list on pages that follow.

Any department/division that uses or contemplates the use of any chemical identified within this list shall notify the appropriate Safety Officer to obtain guidance in proper handling and storage.

Subchapter 7. General Industry Safety Orders
Group 16. Control of Hazardous Substances
Article 109. Hazardous Substances and Processes

New query

---

§5189. Process Safety Management of Acutely Hazardous Materials, Appendix A - List of Acutely Hazardous Chemicals, Toxics and Reactives (Mandatory)

This Appendix contains a listing of substances which present a potential for a catastrophic event at or above the threshold quantity (TQ).

CHEMICAL NAME	CAS*	TQ**
Acetaldehyde	75-07-0	2500
Acrolein (2-Propenal)	107-02-8	150
Acrylyl Chloride	814-68-6	250
Allyl Chloride	107-05-1	1000
Allylamine	107-11-9	1000
Alkylaluminums	Varies	5000
Ammonia, Anhydrous	7664-41-7	10000
Ammonia solutions (greater than 44% ammonia by weight)	7664-41-7	15000
Ammonium Perchlorate	7790-98-9	7500
Ammonium Permanganate	7787-36-2	7500
Arsine (also called Arsenic Hydride)	7784-42-1	100
Bis(Chloromethyl) Ether	542-88-1	100
Boron Trichloride	10294-34-5	2500
Boron Trifluoride	7637-07-2	250
Bromine	7726-95-6	1500
Bromine Chloride	13863-41-7	1500
Bromine Pentafluoride	7789-30-2	2500
Bromine Trifluoride	7787-71-5	15000
3-Bromopropyne (also called Propargyl Bromide)	106-96-7	100
Butyl Hydroperoxide (Tertiary)	75-91-2	5000
Butyl Perbenzoate (Tertiary)	614-45-9	7500
Carbonyl Chloride (see Phosgene)	75-44-5	100
Carbonyl Fluoride	353-50-4	2500
Cellulose Nitrate (concentration greater than 12.6% nitrogen	9004-70-0	2500
Chlorine	7782-50-5	1500
Chlorine Dioxide	10049-04-4	1000
Chlorine Pentrafluoride	13637-63-3	1000
Chlorine Trifluoride	7790-91-2	1000
Chlorodiethylaluminum (also called		

Diethylaluminum Chloride)	96-10-6	5000
1-Chloro-2,4-Dinitrobenzene	97-00-7	5000
Chloromethyl Methyl Ether	107-30-2	500
Chloropicrin	76-06-2	500
Chloropicrin and Methyl Bromide mixture	None	1500
Chloropicrin and Methyl Chloride mixture	None	1500
Commune Hydroperoxide	80-15-9	5000
Cyanogen	460-19-5	2500
Cyanogen Chloride	506-77-4	500
Cyanuric Fluoride	675-14-9	100
Diacetyl Peroxide (concentration greater than 70%)	110-22-5	5000
Diazomethane	334-88-3	500
Dibenzoyl Peroxide	94-36-0	7500
Diborane	19287-45-7	100
Dibutyl Peroxide (Tertiary)	110-05-4	5000
Dichloro Acetylene	7572-29-4	250
Dichlorosilane	4109-96-0	2500
Diethylzinc	557-20-0	10000
Diisopropyl Peroxydicarbonate	105-64-6	7500
Dilauroyl Peroxide	105-74-8	7500
Dimethyldichlorosilane	75-78-5	1000
Dimethylhydrazine, 1,1-	57-14-7	1000
Dimethylamine, Anhydrous	124-40-3	2500
2,4-Dinitroaniline	97-02-9	5000
Ethyl Methyl Ketone Peroxide (also Methyl Ethyl Ketone Peroxide; concentration greater than 60%)	1338-23-4	5000
Ethyl Nitrite	109-95-5	5000
Ethylamine	75-04-7	7500
Ethylene Fluorohydrin	371-62-0	100
Ethylene Oxide	75-21-8	5000
Ethyleneimine	151-56-4	1000
Fluorine	7782-41-4	1000
Formaldehyde (Formalin)	50-00-0	1000
Furan	110-00-9	500
Hexafluoroacetone	684-16-2	5000
Hydrochloric Acid, Anhydrous	7647-01-0	5000
Hydrofluoric Acid, Anhydrous	7664-39-3	1000
Hydrogen Bromide	10035-10-6	5000
Hydrogen Chloride	7647-01-0	5000
Hydrogen Cyanide, Anhydrous	74-90-8	1000
Hydrogen Fluoride	7664-39-3	1000
Hydrogen Peroxide (52% by weight or greater)	7722-84-1	7500
Hydrogen Selenide	7783-07-5	150
Hydrogen Sulfide	7783-06-4	1500
Hydroxylamine	7803-49-8	2500
Iron, Pentacarbonyl	13463-40-6	250
Isopropylamine	75-31-0	5000
Ketene	463-51-4	100
Methacrylaldehyde	78-85-3	1000
Methacryloyl Chloride	920-46-7	150
Methacryloyloxyethyl Isocyanate	30674-80-7	100
Methyl Acrylonitrile	126-98-7	250

Methylamine, Anhydrous	74-89-5	1000
Methyl Bromide	74-83-9	2500
Methyl Chloride	74-87-3	15000
Methyl Chloroformate	79-22-1	500
Methyl Ethyl Ketone Peroxide (concentration greater than 60%)	1338-23-4	5000
Methyl Fluoroacetate	453-18-9	100
Methyl Fluorosulfate	421-20-5	100
Methyl Hydrazine	60-34-4	100
Methyl Iodide	74-88-4	7500
Methyl Isocyanate	624-83-9	250
Methyl Mercaptan	74-93-1	5000
Methyl Vinyl Ketone	79-84-4	100
Methyltrichlorosilane	75-79-6	500
Nickel Carbonly (Nickel Tetracarbonyl)	13463-39-3	150
Nitric Acid (94.5% by weight or greater)	7697-37-2	500
Nitric Oxide	10102-43-9	250
Nitroaniline (para Nitroaniline	100-01-6	5000
Nitromethane	75-52-5	2500
Nitrogen Dioxide	10102-44-0	250
Nitrogen Oxides (NO; NO(2); N2O4; N2O3)	10102-44-0	250
Nitrogen Tetroxide (also called Nitrogen Peroxide)	10544-72-6	250
Nitrogen Trifluoride	7783-54-2	5000
Nitrogen Trioxide	10544-73-7	250
Oleum (65% to 80% by weight; also called Fuming Sulfuric Acid)	8014-94-7	1000
Osmium Tetroxide	20816-12-0	100
Oxygen Difluoride (Fluorine Monoxide)	7783-41-7	100
Ozone	10028-15-6	100
Pentaborane	19624-22-7	100
Peracetic Acid (concentration greater 60% Acetic Acid; also called Peroxyacetic Acid)	79-21-0	1000
Perchloric Acid (concentration greater than 60% by weight)	7601-90-3	5000
Perchloromethyl Mercaptan	594-42-3	150
Perchloryl Fluoride	7616-94-6	5000
Peroxyacetic Acid (concentration greater than 60% Acetic Acid; also called Peracetic Acid)	79-21-0	1000
Phosgene (also called Carbonyl Chloride)	75-44-5	100
Phosphine (Hydrogen Phosphide)	7803-51-2	100
Phosphorus Oxychloride (also called Phosphoryl Chloride)	10025-87-3	1000
Phosphorus Trichloride	7719-12-2	1000
Phosphoryl Chloride (also called Phosphorus Oxychloride)	10025-87-3	1000
Propargyl Bromide	106-96-7	100
Propyl Nitrate	627-3-4	2500
Sarin	107-44-8	100

Selenium Hexafluoride	7783-79-1	1000
Stibine (Antimony Hydride)	7803-52-3	500
Sulfur Dioxide	7446-09-5	1000
Sulfur Pentafluoride	5714-22-7	250
Sulfur Tetrafluoride	7783-60-0	250
Sulfur Trioxide (also called Sulfuric Anhydride)	7446-11-9	1000
Sulfuric Anhydride (also called Sulfur Trioxide)	7446-11-9	1000
Tellurium Hexafluoride	7783-80-4	250
Tetrafluoroethylene	116-14-3	5000
Tetrafluorohydrazine	10036-47-2	5000
Tetramethyl Lead	75-74-1	1000
Thionyl Chloride	7719-09-7	250
Trichloro (chloromethyl) Silane	1558-25-4	100
Trichloro (dichlorophenyl) Silane	27137-85-5	2500
Trichlorosilane	10025-78-2	5000
Trifluorochloroethylene	79-38-9	10000
Trimethyoxysilane	2487-90-3	1500

* Chemical Abstract Service Number

** Threshold Quantity in Pounds (Amount necessary to be covered by this standard)

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Sections 142.3 and 7856, Labor Code.

Go Back to Article 109 Table of Contents

64, 65 & 66

Technical Area: Water Resources
Author: Casey Weaver

Riverside Energy Resource Center Units 3&4
06-SPPE-1

Data Request 64, 65 & 66

BACKGROUND

Descriptions of the project stormwater drainage controls are presented in the application and by reference in the 2004 RERC Units 1&2 Storm Water Pollution Prevention Plan (SWPPP). Generally, all stormwater occurring on the project site is directed to drop inlets or swales and conveyed to a subgrade retention basin.

Statements contained within both of the documents regarding parameters used in design of the stormwater collection and retention system are conflicting. The main conflicting issues are whether the design storm is a 100-year storm or a 50-year storm, and whether the system was designed for the whole volume collected from the design storm or some portion thereof.

The stormwater runoff calculations presented in the 2004 SWPPP and the information used to base the calculations described in both the application and the SWPPP are conflicting. It is not clear how the system was designed and how it will operate during construction and operation.

DATA REQUEST

64. Please clarify what design parameters the stormwater system is designed to manage and how it will operate.

65. a. Please provide the rationale for selecting the volume used in the calculations of the retention basin; and

    b. the selection of the 50-year storm event (as opposed to the 100-year event) and why only a one-hour storm duration was selected.

66. If the design of the drainage control features included using only a percentage of the entire flow expected from the design storm, please explain why that reduced volume was used and where the remainder of the volume will go.

ADDITIONAL INFORMATION

64, 65 & 66.

Provide citation of criteria used to design the pond.

During the development of RERC Units 1&2, the Project utilized criteria that were commonly accepted in the industry to estimate preliminary or approximate sizing of the detention basin for purposes of laying out the site and developing a General Arrangement. During the preliminary phase it was assumed that the pond would contain the difference between the pre-

development and post-development runoff for a 50-year, one-hour storm event. During the same time frame, these same criteria were also being used to size a detention basin for another project in Southern California also under CEC jurisdiction.

The citation for use of these criteria is the Los Angeles County Department of Public Works Hydrology and Sedimentation Manual (1991).

In light of the CEC's questions with regard to the development of Units 3&4, we looked at the difference between pre-development and post-development runoff, added in the additional impervious area as a result of the build-out of the two additional units and used the 100-year one-hour storm value (1.28 in.). Based on these criteria we have determined the size of pond required for the additional two units to be 10,605 cubic feet. See also paragraph two in the response below.

Design criteria seems to conflict with the purpose of the pond.

The design criteria utilized during the design phase by the design engineer (Bibb & Associates, Inc.) was to contain onsite the volume of storm water that represents the difference between the pre-development and post-development runoff for a 100-year, one hour storm. Generally, the purpose of the pond is to retain that volume.

The calculations developed during the design phase of RERC Units 1&2 by the design engineer resulted in a containment volume of just over 6000 cubic feet. During the construction phase of the project, discussions between RERC and the downstream property owner, Riverside Regional Water Quality Control Plant (RRWQCP), resulted in the decision to construct the pond larger than the minimum volume calculated by the design engineer. The resultant as-built volume of the pond is approximately 25,000 cubic feet.

Based on the as-built volume of the pond, and considering the calculations discussed above, we believe that the pond is adequately sized for the build-out of Units 3&4, and that no modification to the pond is required.

Provide a more clear explanation of the purpose of the pond.

The pond works in combination with the grading of the RERC site. All storm water falling on the site is directed by surface flow or underground storm water piping to the detention pond. Pre-development conditions of the site resulted in all of the water generated onsite during a storm event flowing onto the adjoining RRWQCP property unabated. The existing pond provides several advantages to pre-development conditions. For most storm events, the pond captures the storm water and stores it onsite. In these instances, there is no storm water passed onto the adjacent property. The purpose served here is to eliminate any impact from storm water generated onsite to the downstream property. On rare occasions the pond does overflow. In

these instances the purpose of the pond is to slow down the surface flow and reduce the velocity of storm water as it flows to the adjacent property, provide some detention time to settle out sediment and reduce sediment transport, and to spread out the flow as it enters the downstream property rather than having the flow concentrated in one location.

Explain if the pond is or is not designed to handle contact storm water.

The pond does not collect any contact storm water from the project site. Contact storm water is contained at the sources. The contact storm water is collected in a separate stream and is directed to an onsite oil/water separator (OWS). Treated water from the OWS is directed to the raw water tank and is reused in the generation process.