

**CHEVRON USA, INC.
RICHMOND, CALIFORNIA**

**REFINERY
HAZARDOUS WASTE
TREATMENT & STORAGE PERMIT**

April 12, 2016

Prepared By

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I. Part A Application and HWTSF Description

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I. Part A Application and HWTSF Description

A. RCRA Subtitle C Site Identification Form

OMB# 2050-0024; Expires 01/31/2017

<p>SEND COMPLETED FORM TO: The Appropriate State or Regional Office.</p>	<p>United States Environmental Protection Agency RCRA SUBTITLE C SITE IDENTIFICATION FORM</p>		
<p>1. Reason for Submittal</p> <p>MARK ALL BOX(ES) THAT APPLY</p>	<p>Reason for Submittal:</p> <p><input type="checkbox"/> To provide an Initial Notification (first time submitting site identification information / to obtain an EPA ID number for this location)</p> <p><input type="checkbox"/> To provide a Subsequent Notification (to update site identification information for this location)</p> <p><input type="checkbox"/> As a component of a First RCRA Hazardous Waste Part A Permit Application</p> <p><input checked="" type="checkbox"/> As a component of a Revised RCRA Hazardous Waste Part A Permit Application (Amendment # _____)</p> <p><input type="checkbox"/> As a component of the Hazardous Waste Report (if marked, see sub-bullet below)</p> <p><input type="checkbox"/> Site was a TSD facility and/or generator of >1,000 kg of hazardous waste, >1 kg of acute hazardous waste, or >100 kg of acute hazardous waste spill cleanup in one or more months of the report year (or State equivalent LQG regulations)</p>		
<p>2. Site EPA ID Number</p>	<p>EPA ID Number <input type="text" value="C"/> <input type="text" value="A"/> <input type="text" value="D"/> <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="9"/> <input type="text" value="1"/> <input type="text" value="1"/> <input type="text" value="4"/> <input type="text" value="9"/> <input type="text" value="1"/> <input type="text" value="9"/></p>		
<p>3. Site Name</p>	<p>Name: CHEVRON USA, INC. RICHMOND REFINERY</p>		
<p>4. Site Location Information</p>	<p>Street Address: 841 CHEVRON WAY</p> <p>City, Town, or Village: RICHMOND</p> <p>State: CA</p>		<p>County: ContraCosta</p> <p>Country: USA</p> <p>Zip Code: 94801</p>
<p>5. Site Land Type</p>	<p><input checked="" type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other</p>		
<p>6. NAICS Code(s) for the Site (at least 5-digit codes)</p>	<p>A. <input type="text" value="3"/> <input type="text" value="2"/> <input type="text" value="4"/> <input type="text" value="1"/> <input type="text" value="1"/> <input type="text" value="0"/></p>	<p>C. <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/></p>	<p>B. <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/></p> <p>D. <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/></p>
<p>7. Site Mailing Address</p>	<p>Street or P.O. Box: PO BOX 1272</p> <p>City, Town, or Village: RICHMOND</p> <p>State: CA</p> <p>Country: USA</p> <p>Zip Code: 94802</p>		
<p>8. Site Contact Person</p>	<p>First Name: LISA</p> <p>MI: <input type="text" value=""/></p> <p>Last: DUNCAN</p> <p>Title: HAZARDOUS WASTE REGULATORY SPECIALIST</p> <p>Street or P.O. Box: 841 CHEVRON WAY</p> <p>City, Town or Village: RICHMOND</p> <p>State: CA</p> <p>Country: USA</p> <p>Zip Code: 94801</p> <p>Email: LISA.DUNCAN@CHEVRON.COM</p> <p>Phone: (510) 242-5610</p> <p>Ext.: <input type="text" value=""/></p> <p>Fax: 510-242-5564</p>		
<p>9. Legal Owner and Operator of the Site</p>	<p>A. Name of Site's Legal Owner: CHEVRON USA, INC</p> <p>Owner Type: <input checked="" type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other</p> <p>Street or P.O. Box: 6001 BOLLINGER CANYON RD</p> <p>City, Town, or Village: SAN RAMON</p> <p>State: CA</p> <p>Country: USA</p> <p>B. Name of Site's Operator: CHEVRON USA, INC</p> <p>Operator Type: <input checked="" type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other</p>		<p>Date Became Owner: 09/15/1901</p> <p>Phone: 925-842-1000</p> <p>Zip Code: 94583</p> <p>Date Became Operator: 07/13/1902</p>

EPA ID Number C A D | 0 0 9 | 1 1 4 | 9 1 9

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10. Type of Regulated Waste Activity (at your site)
 Mark "Yes" or "No" for all current activities (as of the date submitting the form); complete any additional boxes as instructed.

A. Hazardous Waste Activities; Complete all parts 1-10.

1. Generator of Hazardous Waste
 If "Yes," mark only one of the following – a, b, or c.

a. LQG: Generates, in any calendar month, 1,000 kg/mo (2,200 lbs/mo.) or more of hazardous waste; or Generates, in any calendar month, or accumulates at any time, more than 1 kg/mo (2.2 lbs/mo) of acute hazardous waste; or Generates, in any calendar month, or accumulates at any time, more than 100 kg/mo (220 lbs/mo) of acute hazardous spill cleanup material.

b. SQG: 100 to 1,000 kg/mo (220 – 2,200 lbs/mo) of non-acute hazardous waste.

c. CESQG: Less than 100 kg/mo (220 lbs/mo) of non-acute hazardous waste.

If "Yes" above, indicate other generator activities in 2-10.

2. Short-Term Generator (generate from a short-term or one-time event and not from on-going processes). If "Yes," provide an explanation in the Comments section.

3. United States Importer of Hazardous Waste

4. Mixed Waste (hazardous and radioactive) Generator

5. Transporter of Hazardous Waste
 If "Yes," mark all that apply.

a. Transporter

b. Transfer Facility (at your site)

6. Treater, Storer, or Disposer of Hazardous Waste
 Note: A hazardous waste Part B permit is required for these activities.

7. Recycler of Hazardous Waste

8. Exempt Boiler and/or Industrial Furnace
 If "Yes," mark all that apply.

a. Small Quantity On-site Burner Exemption

b. Smelting, Melting, and Refining Furnace Exemption

9. Underground Injection Control

10. Receives Hazardous Waste from Off-site

B. Universal Waste Activities; Complete all parts 1-2.

1. Large Quantity Handler of Universal Waste (you accumulate 5,000 kg or more) [refer to your State regulations to determine what is regulated]. Indicate types of universal waste managed at your site. If "Yes," mark all that apply.

a. Batteries

b. Pesticides

c. Mercury containing equipment

d. Lamps

e. Other (specify) CATHODE RAY TUBES

f. Other (specify) ELECTRONIC DEVICES

g. Other (specify) _____

2. Destination Facility for Universal Waste
 Note: A hazardous waste permit may be required for this activity.

C. Used Oil Activities; Complete all parts 1-4.

1. Used Oil Transporter
 If "Yes," mark all that apply.

a. Transporter

b. Transfer Facility (at your site)

2. Used Oil Processor and/or Re-refiner
 If "Yes," mark all that apply.

a. Processor

b. Re-refiner

3. Off-Specification Used Oil Burner

4. Used Oil Fuel Marketer
 If "Yes," mark all that apply.

a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner

b. Marketer Who First Claims the Used Oil Meets the Specifications

EPA ID Number C A D 0 0 9 1 1 4 9 1 9

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D. Eligible Academic Entities with Laboratories—Notification for opting into or withdrawing from managing laboratory hazardous wastes pursuant to 40 CFR Part 262 Subpart K

- ❖ You can ONLY Opt into Subpart K if:
 - you are at least one of the following: a college or university; a teaching hospital that is owned by or has a formal affiliation agreement with a college or university; or a non-profit research institute that is owned by or has a formal affiliation agreement with a college or university; AND
 - you have checked with your State to determine if 40 CFR Part 262 Subpart K is effective in your state

Y N 1. Opting into or currently operating under 40 CFR Part 262 Subpart K for the management of hazardous wastes in laboratories
See the item-by-item instructions for definitions of types of eligible academic entities. Mark all that apply:

- a. College or University
- b. Teaching Hospital that is owned by or has a formal written affiliation agreement with a college or university
- c. Non-profit Institute that is owned by or has a formal written affiliation agreement with a college or university

Y N 2. Withdrawing from 40 CFR Part 262 Subpart K for the management of hazardous wastes in laboratories

11. Description of Hazardous Waste

A. Waste Codes for Federally Regulated Hazardous Wastes. Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g., D001, D003, F007, U112). Use an additional page if more spaces are needed.

D001	D002	D003	D004	D006	D007	D008
D009	D010	D011	D018	D023	D024	D025
F037	F038	K049	K050	K051	K052	K169
K170	K171	K172				

B. Waste Codes for State-Regulated (i.e., non-Federal) Hazardous Wastes. Please list the waste codes of the State-Regulated hazardous wastes handled at your site. List them in the order they are presented in the regulations. Use an additional page if more spaces are needed.

121	122	132	135	141	161	162
181	222	223	241	261	331	342
343	352	491	541	581	731	791
792	801					

B. Hazardous Waste Permit Information Form

EPA ID Number | C | A | D | 0 | 0 | 9 | 1 | 1 | 4 | 9 | 1 | 9 |

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United States Environmental Protection Agency HAZARDOUS WASTE PERMIT INFORMATION FORM			
1. Facility Permit Contact	First Name: LISA	MI:	Last Name: DUNCAN
	Contact Title: HAZARDOUS WASTE REGULATORY SPECIALIST		
	Phone: (510) 242-5810	Ext.:	Email: Lisa.Duncan@chevron.com
2. Facility Permit Contact Mailing Address	Street or P.O. Box: 841 CHEVRON WAY		
	City, Town, or Village: RICHMOND		
	State: CA		
	Country: USA	Zip Code: 94801	
3. Operator Mailing Address and Telephone Number	Street or P.O. Box: 6001 BOLLINGER CANYON RD		
	City, Town, or Village: SAN RAMON		
	State: CA	Phone: 925-842-1000	
	Country: USA	Zip Code: 94583	
4. Facility Existence Date	Facility Existence Date (mm/dd/yyyy): 05/16/1983 (Interim Status Document Issued)		
5. Other Environmental Permits			
A. Facility Type <i>(Enter code)</i>	B. Permit Number		C. Description
N	C A 0 0 0 5 1 4 3		NPDES Permit, RWQCB Order R2-2011-0049
E	R 2 - 2 0 1 2 - 0 0 9 6		SF Bay Mercury & PCB Order, RWQCB
E	3 0 2 1		2011/2016 Wastewater Discharge, City of Richmond
E	A 0 0 1 0 - V 1		Title V Air Permit, BAAQMD
R	0 6 - B R K - 1 3		RCRA Trtmnt/Storage Operating Permit, DTSC
E	M 1 9 8 7 . 0 1 5 . 1 5		Shoreline Activities Permit, BCDC
D	M 1 9 8 4 . 0 4 3 . 1 3		Maintenance Dredging Permit, BCDC
D	2 0 0 9 - 0 0 0 5 2 S		Maintenance Dredging Permit, ACOE
E	R 2 - 2 0 1 2 - 0 0 1 5		Refinery Site Cleanup Requirements, RWQCB
E	R 2 - 2 0 0 6 - 0 0 7 8		Castro Cove Cleanup Order, RWQCB
E	R 2 - 2 0 1 1 - 0 0 3 6		Waste Discharge Requirements, RWQCB
E	7 7 0 8 3 7		Annual Business Operation, local CUPA
6. Nature of Business: THE REFINERY IS AN INTEGRATED PETROLEUM REFINERY WHICH PRODUCES A BROAD RANGE OF PETROLEUM PRODUCTS, INCLUDING TRANSPORTATION FUELS AND LUBRICANTS.			

EPA ID Number C A D 0 0 9 1 1 4 9 1 9

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United States Environmental Protection Agency HAZARDOUS WASTE PERMIT INFORMATION FORM												
1. Facility Permit Contact	First Name:			MI:		Last Name:						
	Contact Title:											
	Phone:					Ext.:		Email:				
2. Facility Permit Contact Mailing Address	Street or P.O. Box:											
	City, Town, or Village:											
	State:											
	Country:						Zip Code:					
3. Operator Mailing Address and Telephone Number	Street or P.O. Box:											
	City, Town, or Village:											
	State:						Phone:					
	Country:						Zip Code:					
4. Facility Existence Date	Facility Existence Date (mm/dd/yyyy):											
5. Other Environmental Permits												
A. Facility Type <i>(Enter code)</i>	B. Permit Number										C. Description	
E	P	R	C	8	8	1	8	.	1			Long Wharf Lease, California State Lands Commission
D	0	7	A	U	G	2	0	1	3			Maintenance Dredging Permit, RWQCB
6. Nature of Business:												

EPA ID Number **C | A | D | 0 | 0 | 9 | 1 | 1 | 4 | 9 | 1 | 9**

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7. Process Codes and Design Capacities – Enter information in the Section on Form Page 3

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. If more lines are needed, attach a separate sheet of paper with the additional information. For “other” processes (i.e., D99, S99, T04 and X99), describe the process (including its design capacity) in the space provided in Item 8.

B. PROCESS DESIGN CAPACITY – For each code entered in Item 7.A; enter the capacity of the process.

1. **AMOUNT** – Enter the amount. In a case where design capacity is not applicable (such as in a closure/post-closure or enforcement action) enter the total amount of waste for that process.

2. **UNIT OF MEASURE** – For each amount entered in Item 7.B(1), enter the code in Item 7.B(2) from the list of unit of measure codes below that describes the unit of measure used. Select only from the units of measure in this list.

C. PROCESS TOTAL NUMBER OF UNITS – Enter the total number of units for each corresponding process code.

Process Code	Process	Appropriate Unit of Measure for Process Design Capacity	Process Code	Process	Appropriate Unit of Measure for Process Design Capacity
Disposal			Treatment (Continued)		
D79	Underground Injection Well Disposal	Gallons; Liters; Gallons Per Day; or Liters Per Day	T81	Cement Kiln	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; Liters Per Hour; Kilograms Per Hour; or Million BTU Per Hour
D80	Landfill	Acre-feet; Hectares-meter; Acres; Cubic Meters; Hectares; Cubic Yards	T82	Lime Kiln	
D81	Land Treatment	Acres or Hectares	T83	Aggregate Kiln	
D82	Ocean Disposal	Gallons Per Day or Liters Per Day	T84	Phosphate Kiln	
D83	Surface Impoundment Disposal	Gallons; Liters; Cubic Meters; or Cubic Yards	T85	Coke Oven	
D99	Other Disposal	Any Unit of Measure Listed Below	T86	Blast Furnace	
Storage			T87	Smelting, Melting, or Refining Furnace	
S01	Container	Gallons; Liters; Cubic Meters; or Cubic Yards	T88	Titanium Dioxide Chloride Oxidation Reactor	
S02	Tank Storage	Gallons; Liters; Cubic Meters; or Cubic Yards	T89	Methane Reforming Furnace	
S03	Waste Pile	Cubic Yards or Cubic Meters	T90	Pulping Liquor Recovery Furnace	
S04	Surface Impoundment	Gallons; Liters; Cubic Meters; or Cubic Yards	T91	Combustion Device Used in the Recovery of Sulfur Values from Spent Sulfuric Acid	
S05	Drip Pad	Gallons; Liters; Cubic Meters; Hectares; or Cubic Yards	T92	Halogen Acid Furnaces	
S06	Containment Building Storage	Cubic Yards or Cubic Meters	T93	Other Industrial Furnaces Listed in 40 CFR 260.10	
S99	Other Storage	Any Unit of Measure Listed Below	T94	Containment Building Treatment	Cubic Yards; Cubic Meters; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; BTU Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; Gallons Per Day; Liters Per Day; Metric Tons Per Hour; or Million BTU Per Hour
Treatment			Miscellaneous (Subpart X)		
T01	Tank Treatment	Gallons Per Day; Liters Per Day	X01	Open Burning/Open Detonation	Any Unit of Measure Listed Below
T02	Surface Impoundment	Gallons Per Day; Liters Per Day	X02	Mechanical Processing	Short Tons Per Hour; Metric Tons Per Hour; Short Tons Per Day; Metric Tons Per Day; Pounds Per Hour; Kilograms Per Hour; Gallons Per Hour; Liters Per Hour; or Gallons Per Day
T03	Incinerator	Short Tons Per Hour; Metric Tons Per Hour; Gallons Per Hour; Liters Per Hour; BTUs Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Gallons Per Day; Metric Tons Per Hour; or Million BTU Per Hour	X03	Thermal Unit	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Short Tons Per Day; BTUs Per Hour; Gallons Per Day; Liters Per Hour; or Million BTU Per Hour
T04	Other Treatment	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Short Tons Per Day; BTUs Per Hour; Gallons Per Day; Liters Per Hour; or Million BTU Per Hour	X04	Geologic Repository	Cubic Yards; Cubic Meters; Acre-feet; Hectare-meter; Gallons; or Liters
T80	Boiler	Gallons; Liters; Gallons Per Hour; Liters Per Hour; BTUs Per Hour; or Million BTU Per Hour	X99	Other Subpart X	Any Unit of Measure Listed Below
Unit of Measure		Unit of Measure Code	Unit of Measure		Unit of Measure Code
Gallons	G	Short Tons Per Hour	D	Cubic Yards	Y
Gallons Per Hour	E	Short Tons Per Day	N	Cubic Meters	C
Gallons Per Day	U	Metric Tons Per Hour	W	Acres	B
Liters	L	Metric Tons Per Day	S	Acre-feet	A
Liters Per Hour	H	Pounds Per Hour	J	Hectares	Q
Liters Per Day	V	Kilograms Per Hour	X	Hectare-meter	F
		Million BTU Per Hour	X	BTU Per Hour	I

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7. Process Codes and Design Capacities (Continued)									
EXAMPLE FOR COMPLETING Item 7 (shown in line number X-1 below): A facility has a storage tank, which can hold 533,788 gallons.									
Line Number	A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY		C. Process Total Number of Units	For Official Use Only		
				(1) Amount (Specify)	(2) Unit of Measure				
X 1	S	0	2	533,788	G	001			
1	S	0	1	4620	G	001			
2	S	0	1	13800	G	001			
3	S	0	1	147000	G	001			
4	S	0	1	405	Y	001			
5	S	0	1	210000	G	001			
6									
7									
8									
9									
1 0									
1 1									
1 2									
1 3									
<i>Note: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the line sequentially, taking into account any lines that will be used for "other" process (i.e., D99, S99, T04, and X99) in Item 8.</i>									
8. Other Processes (Follow instructions from Item 7 for D99, S99, T04, and X99 process codes)									
Line Number (Enter #s in sequence with Item 7)	A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY		C. Process Total Number of Units	For Official Use Only		
				(1) Amount (Specify)	(2) Unit of Measure				
X 2	T	0	4	100.00	U	001			
0 6	T	0	4	21000	U	001			
0 7	T	0	4	21000	U	003			
0 8	T	0	4	63000	U	003			
0 9	T	0	4	16200	U	002			
1 0	T	0	4	42000	U	002			
1 1	T	0	4	21000	U	001			
1 2	T	0	4	8100	U	001			

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9. Description of Hazardous Wastes - Enter Information in the Sections on Form Page 5

- A. EPA HAZARDOUS WASTE NUMBER – Enter the four-digit number from 40 CFR, Part 261 Subpart D of each listed hazardous waste you will handle. For hazardous wastes which are not listed in 40 CFR, Part 261 Subpart D, enter the four-digit number(s) from 40 CFR Part 261, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.
- B. ESTIMATED ANNUAL QUANTITY – For each listed waste entered in Item 9.A, estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in Item 9.A, estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.
- C. UNIT OF MEASURE – For each quantity entered in Item 9.B, enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure, taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed hazardous waste: For each listed hazardous waste entered in Item 9.A, select the code(s) from the list of process codes contained in Items 7.A and 8.A on page 3 to indicate all the processes that will be used to store, treat, and/or dispose of all listed hazardous wastes.

For non-listed waste: For each characteristic or toxic contaminant entered in Item 9.A, select the code(s) from the list of process codes contained in Items 7.A and 8.A on page 3 to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

NOTE: THREE SPACES ARE PROVIDED FOR ENTERING PROCESS CODES. IF MORE ARE NEEDED:

1. Enter the first two as described above.
2. Enter "000" in the extreme right box of Item 9.D(1).
3. Use additional sheet, enter line number from previous sheet, and enter additional code(s) in Item 9.E.

2. PROCESS DESCRIPTION: If code is not listed for a process that will be used, describe the process in Item 9.D(2) or in Item 9.E(2).

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER – Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in Item 9.A. On the same line complete Items 9.B, 9.C, and 9.D by estimating the total annual quantity of the waste and describing all the processes to be used to store, treat, and/or dispose of the waste.
2. In Item 9.A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In Item 9.D.2 on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each EPA Hazardous Waste Number that can be used to describe the hazardous waste.

EXAMPLE FOR COMPLETING Item 9 (shown in line numbers X-1, X-2, X-3, and X-4 below) – A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operations. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES													
				(1) PROCESS CODES (Enter Code)						(2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))							
X	1	K 0 5 4	P	T	0	3	D	8	0								
X	2	D 0 0 2	P	T	0	3	D	8	0								
X	3	D 0 0 1	P	T	0	3	D	8	0								
X	4	D 0 0 2															Included With Above

EPA ID Number C A D 0 0 9 1 1 4 9 1 9

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9. Description of Hazardous Wastes (Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)															
Line Number	A. EPA Hazardous Waste No. (Enter code)			B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES					(2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))				
						(1) PROCESS CODES (Enter Code)									
1	D	0	0	1	10000	T	S	0	1	T	0	4			T04-6, -7, -8 -10, & -11
2	D	0	0	2											included with above
3	D	0	0	3											included with above
4	D	0	0	4											included with above
5	D	0	0	6											included with above
6	D	0	0	7											included with above
7	D	0	0	8											included with above
8	D	0	0	9											included with above
9	D	0	1	0											included with above
10	D	0	1	1											included with above
11	D	0	1	8											included with above
12	D	0	2	3											included with above
13	D	0	2	4											included with above
14	D	0	2	5											included with above
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EPA ID Number CA D 0 0 9 1 1 4 9 1 9

OMB#: 2050-0024; Expires 01/31/2017

9. Description of Hazardous Wastes (Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES	
				(1) PROCESS CODES (Enter Code)	(2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))
1	D 0 0 2	10000	T	S 0 1 T 0 4	T04-6, -7, & -8
2	D 0 0 3				included with above
3	D 0 0 4				included with above
4	D 0 0 6				included with above
5	D 0 0 7				included with above
6	D 0 0 8				included with above
7	D 0 0 9				included with above
8	D 0 1 0				included with above
9	D 0 1 1				included with above
1 0	D 0 1 8				included with above
1 1	D 0 2 3				included with above
1 2	D 0 2 4				included with above
1 3	D 0 2 5				included with above
1 4					
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3 6					

EPA ID Number C A D 0 0 9 1 1 4 9 1 9

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9. Description of Hazardous Wastes (Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)													
Line Number	A. EPA Hazardous Waste No. (Enter code)				B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES						(2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))
	(1) PROCESS CODES (Enter Code)												
1	D	0	0	3	1250	T	S	0	1	T	0	4	T04-6, -7, -8, -9, -10 & -11
2	D	0	0	4									included with above
3	D	0	0	6									included with above
4	D	0	0	7									included with above
5	D	0	0	8									included with above
6	D	0	0	9									included with above
7	D	0	1	0									included with above
8	D	0	1	1									included with above
9	D	0	1	8									included with above
10	D	0	2	3									included with above
11	D	0	2	4									included with above
12	D	0	2	5									included with above
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EPA ID Number C A D 0 0 9 1 1 4 9 1 9

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9. Description of Hazardous Wastes (Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)													
Line Number	A. EPA Hazardous Waste No. (Enter code)				B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES						(2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))
	(1) PROCESS CODES (Enter Code)												
1	F	0	3	7	500	T	S	0	1	T	0	4	T04-6, -9, -10 & -12
2	D	0	0	1									included with above
3	D	0	0	3									included with above
4	D	0	0	4									included with above
5	D	0	0	6									included with above
6	D	0	0	9									included with above
7	D	0	1	0									included with above
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9. Description of Hazardous Wastes (Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)														
Line Number	A. EPA Hazardous Waste No. (Enter code)			B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES						(2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))		
						(1) PROCESS CODES (Enter Code)								
1	F	0	3	8	500	T	S	0	1	T	0	4		T04-6, -9, -10 & -12
2	D	0	0	1										included with above
3	D	0	0	3										included with above
4	D	0	0	4										included with above
5	D	0	0	6										included with above
6	D	0	0	9										included with above
7	D	0	1	0										included with above
8	D	0	1	8										included with above
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EPA ID Number C A D 0 0 9 1 1 4 9 1 9

OMB#: 2050-0024; Expires 01/31/2017

9. Description of Hazardous Wastes (Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)														
Line Number	A. EPA Hazardous Waste No. (Enter code)			B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES						(2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))		
						(1) PROCESS CODES (Enter Code)								
1	K	0	4	9	500	T	S	0	1	T	0	4		T04-6, -9, -10 & -12
2	D	0	0	1										included with above
3	D	0	0	3										included with above
4	D	0	0	4										included with above
5	D	0	0	6										included with above
6	D	0	0	9										included with above
7	D	0	1	0										included with above
8	D	0	1	8										included with above
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EPA ID Number CA D 0 0 9 1 1 4 9 1 9

OMB#: 2050-0024; Expires 01/31/2017

9. Description of Hazardous Wastes (Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)													
Line Number	A. EPA Hazardous Waste No. (Enter code)					B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES				(2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))	
	(1) PROCESS CODES (Enter Code)												
1	K	0	5	0	40	T	S	0	1	T	0	4	T04-10, T04-12
2	D	0	0	1									included with above
3	D	0	0	2									included with above
4	D	0	0	3									included with above
5	D	0	0	4									included with above
6	D	0	0	6									included with above
7	D	0	0	8									included with above
8	D	0	0	9									included with above
9	D	0	1	0									included with above
10	D	0	1	8									included with above
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EPA ID Number C A D 0 0 9 1 1 4 9 1 9

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9. Description of Hazardous Wastes (Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)														
Line Number	A. EPA Hazardous Waste No. (Enter code)					B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES						
								(1) PROCESS CODES (Enter Code)					(2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))	
1	K	0	5	1	1300	T	S	0	1	T	0	4		T04-6, -9, -10, & -12
2	D	0	0	3										included with above
3	D	0	0	4										included with above
4	D	0	0	6										included with above
5	D	0	0	9										included with above
6	D	0	1	0										included with above
7	D	0	1	8										included with above
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9. Description of Hazardous Wastes (Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)													
Line Number	A. EPA Hazardous Waste No. (Enter code)					B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES					
								(1) PROCESS CODES (Enter Code)					
1	K	0	5	2	40	T	S	0	1	T	0	4	T04-10 & T04-12
2	D	0	0	1									included with above
3	D	0	0	4									included with above
4	D	0	0	6									included with above
5	D	0	0	7									included with above
6	D	0	0	9									included with above
7	D	0	1	0									included with above
8	D	0	1	8									included with above
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9. Description of Hazardous Wastes (Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)															
Line Number	A. EPA Hazardous Waste No. (Enter code)			B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES					(2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))				
						(1) PROCESS CODES (Enter Code)									
1	K	1	6	9	120	T	S	0	1	T	0	4			T04-6, -9, -10, & -12
2	D	0	0	1											included with above
3	D	0	0	3											included with above
4	D	0	0	4											included with above
5	D	0	0	6											included with above
6	D	0	0	7											included with above
7	D	0	0	8											included with above
8	D	0	0	9											included with above
9	D	0	1	0											included with above
10	D	0	1	8											included with above
11	D	0	2	3											included with above
12	D	0	2	4											included with above
13	D	0	2	5											included with above
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9. Description of Hazardous Wastes (Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)													
Line Number	A. EPA Hazardous Waste No. (Enter code)					B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES				(2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))	
	(1) PROCESS CODES (Enter Code)												
1	K	1	7	0	120	T	S	0	1	T	0	4	T04-6, -9, -10, & -12
2	D	0	0	1									included with above
3	D	0	0	3									included with above
4	D	0	0	4									included with above
5	D	0	0	6									included with above
6	D	0	0	7									included with above
7	D	0	0	8									included with above
8	D	0	0	9									included with above
9	D	0	1	0									included with above
10	D	0	1	8									included with above
11	D	0	2	3									included with above
12	D	0	2	4									included with above
13	D	0	2	5									included with above
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9. Description of Hazardous Wastes (Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)													
Line Number	A. EPA Hazardous Waste No. (Enter code)			B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES							
						(1) PROCESS CODES (Enter Code)				(2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))			
1	K	1	7	1	2000	T	S	0	1	T	0	4	T04-9, -10, -11, & -12
2	D	0	0	1									included with above
3	D	0	0	3									included with above
4	D	0	0	4									included with above
5	D	0	0	6									included with above
6	D	0	0	7									included with above
7	D	0	0	8									included with above
8	D	0	0	9									included with above
9	D	0	1	0									included with above
1	0												
1	1												
1	2												
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EPA ID Number C A D 0 0 9 1 1 4 9 1 9

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9. Description of Hazardous Wastes (Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)																						
Line Number	A. EPA Hazardous Waste No. (Enter code)			B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES					(2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))											
						(1) PROCESS CODES (Enter Code)																
1	K	1	7	2	2000	T	S	0	1	T	0	4									T04-9, -10, -11, & -12	
2	D	0	0	1																	included with above	
3	D	0	0	3																	included with above	
4	D	0	0	4																	included with above	
5	D	0	0	6																	included with above	
6	D	0	0	7																	included with above	
7	D	0	0	8																	included with above	
8	D	0	0	9																	included with above	
9	D	0	1	0																	included with above	
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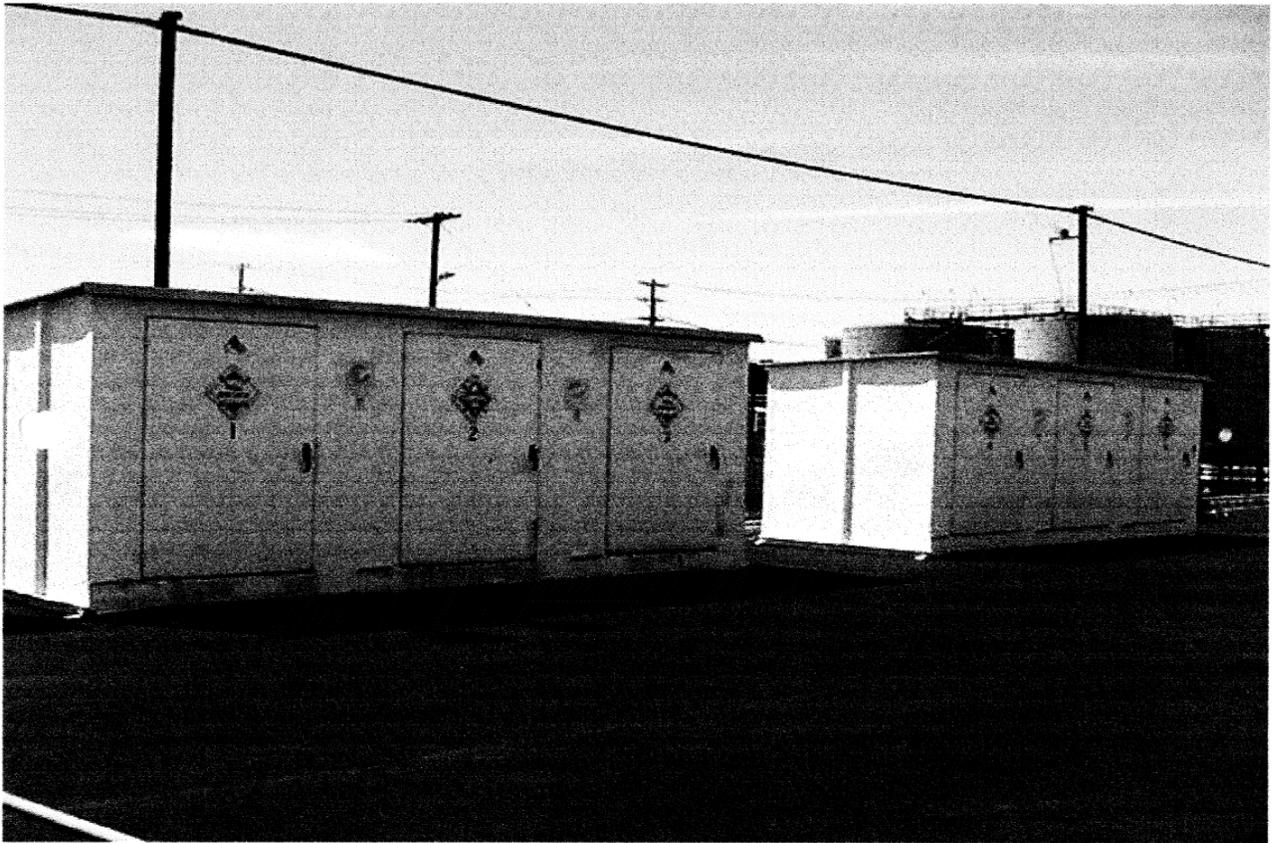
9. Description of Hazardous Wastes (Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)													
Line Number	A. EPA Hazardous Waste No. (Enter code)					B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES					
	(1) PROCESS CODES (Enter Code)		(2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))										
1	F	0	3	7	10	T	S	0	1	T	0	4	T04-12
2	F	0	3	8									included with above
3	K	0	4	9									included with above
4	K	0	5	0									included with above
5	K	0	5	1									included with above
6	K	1	6	9									included with above
7	K	1	7	0									included with above
8	K	1	7	1									included with above
9	K	1	7	2									included with above
1	0	D	0	0	1								included with above
1	1	D	0	0	2								included with above
1	2	D	0	0	3								included with above
1	3	D	0	0	4								included with above
1	4	D	0	0	6								included with above
1	5	D	0	0	7								included with above
1	6	D	0	0	8								included with above
1	7	D	0	0	9								included with above
1	8	D	0	1	0								included with above
1	9	D	0	1	8								included with above
2	0												
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10. Map
Attach to this application a topographical map, or other equivalent map, of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all spring, rivers, and other surface water bodies in this map area. See instructions for precise requirements.
11. Facility Drawing
All existing facilities must include a scale drawing of the facility (see instructions for more detail).
12. Photographs
All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, and disposal areas; and sites of future storage, treatment, or disposal areas (see instructions for more detail).
13. Comments
ITEM 8, LINE 06: Oxidation of sulfidic wastes ITEM 8, LINE 07: Neutralization, pH control/adjustment ITEM 8, LINE 08: Metals reduction, precipitation, flocculation, and/or sedimentation ITEM 8, LINE 09: Oxidation of ignitable, flammable, pyrophoric, self-heating wastes. ITEM 8, LINE 10: De-liquification of semi-solid wastes, Filtration, and/or Phase Separation ITEM 8, LINE 11: Sparging and/or Stripping ITEM 8, LINE 12: Stabilization

C. Photographs



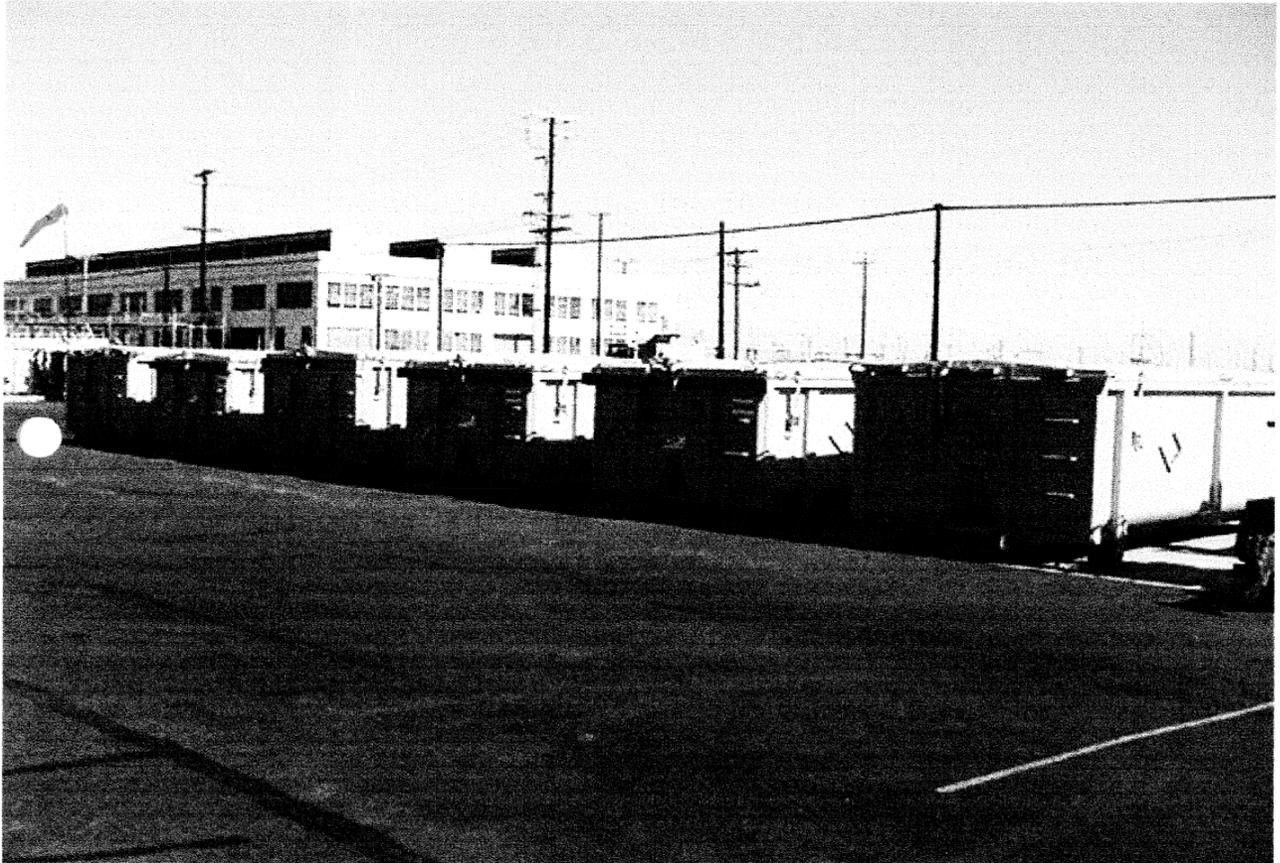
Area I
Process S01 – line 1



Area II
Process S01 – line 2
Process T04 – line 7



Area III
Process S01 – line 3
Process T04 – line 6
Process T04 – line 8
Process T04 – line 11



Area IV

Process S01 – line 4
Process T04 – line 7
Process T04 – line 9
Process T04 – line 11
Process T04 – line 12



Area V
Process S01 – line 5
Process T04 – line 10
Process T04 – line 11



**Fire Water Hose
Self-Contained Breathing Apparatus
Fire Extinguisher
Safety Shower/Eye Wash Unit**



**Personnel Office and
Shower/Change Trailer**



**Storage Sheds
Laboratory**

D. Hazardous Waste Treatment and Storage Facility Identification

The name is the Chevron Hazardous Waste Treatment and Storage Facility (HWTSE). It is located within the Chevron Richmond Refinery (Refinery) in Richmond, California. The Refinery's EPA Identification Number is CAD 009114919.

E. HWTSE Description

The HWTSE is located on a 1.3 acre site within the Refinery, which is a 2900-acre site. This HWTSE is an existing HWTSE, which is not on Indian lands, with a RCRA Part B permit expiring on October 11, 2016. The most recent permit renewal was granted on October 11, 2006. The permit renewal issued prior to that was granted on September 10, 1992. The Interim Status Document was issued for the HWTSE on May 16, 1983 although construction was not completed until October 1983. The Refinery is an integrated petroleum refinery which produces a broad range of petroleum products including transportation fuels and lubricants. The HWTSE is utilized for storage and treatment of many of the hazardous wastes generated at the Refinery. Hazardous wastes not stored or treated at the HWTSE are managed off-site. The HWTSE is arranged into five major storage/treatment areas to avoid the potential for physical contact of different waste types. These areas are more specifically described below. The HWTSE has a small laboratory for performing on-site evaluations of waste and a personnel office and shower/change trailer. There are two sheds for storing safety related items and spill containment, control, and cleanup materials, located along the east boundary of the HWTSE. The administrative offices for the HWTSE are just outside the main entrance gate on the northern boundary of the HWTSE.

F. HWTSE Location

The HWTSE is located at the southeast corner of the intersection of Mill and Channel Streets within the Refinery, as shown on Map #4 in Section XIV. The HWTSE is situated at 37° 55' 19" N latitude and 122° 23' 02" W longitude.

G. Description of Storage and Treatment Operations

The five areas in which hazardous wastes are stored and/or treated at the HWTSE are described in Table VIII-2. The locations of all areas are shown on Map #2 provided in Section XIV.

H. Process Design Capacity

Information on the process design capacity of the storage and treatment processes at the HWTSE is described in Table VIII-2 in Section VIII and in Section IX, Treatment Procedures.

I. Hazardous Wastes at the HWTSE

Information on the types and quantities of hazardous wastes handled at the HWTSE is provided in Section VIII.

J. Identification of Personnel Who Prepared the Operation Plan

This Operation Plan for the HWTSE was prepared by:

Lisa Duncan, Hazardous Waste Regulatory Specialist
Keith Kobara, HWTSE Supervisor

K. Certification and Signature of Preparer

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



Signature
Kory Judd

Printed Name
Regional General Manager

Title
12 April 2016

Date

(This should be a responsible individual authorized to make management decisions which govern the operation of the HWTSE)

L. Waste Minimization Certification

I hereby certify under penalty of law that personnel under my direction and supervision at this Facility are undertaking specific steps in accordance with a program in place to minimize the amount and toxicity of hazardous wastes generated at this Facility to a degree economically practicable and that the method utilized for the treatment, storage, or disposal of hazardous wastes is the practicable method currently available to this Facility which minimizes the present and future threat to human health and the environment. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Shawn Lee

Signature

SHAWN LEE

Printed Name

HES MANAGER

Title

4-12-16

Date

NOTE: This certification shall be renewed annually, following the date given above. These copies shall be retained as part of the HWTSE's written operating record.

II. Security, Signage, and Vehicle Traffic Measures

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- A. General Refinery Security
- B. HWTSF Security
 - 1. Fencing
 - 2. Gates
 - 3. HWTSF Signs
 - 4. Lighting
 - 5. Hours of Operation
- C. Vehicle Traffic at the HWTSF
 - 1. Traffic Patterns and Control
 - 2. Estimated Volume of Traffic

II. Security, Signage, and Vehicle Traffic Measures

A. General Refinery Security

Plant security is provided by the Refinery's plant protection personnel. Security is provided 24 hours, 7 days per week for the entire Refinery, including the HWTSF. This prevents unpermitted public access. Security guards control the gates and routinely patrol the Refinery. Guards are able to communicate with the Plant Protection Dispatcher either by telephone or by two-way radios.

Routine entry for Refinery personnel and approved contractors is through guarded gates. Visitors to the Refinery are either cleared with the gate guard in advance of their arrival or are held at the gate until clearance has been given by an authorized person. All visitors are logged into and out of the Refinery and are issued a visitor's badge. Map #5 outlines the borders of the Refinery and shows the location of the Refinery gates and fencing.

B. HWTSF Security

The security devices used at the HWTSF are shown on Map #3.

1. Fencing

A fence surrounds the entire perimeter of the HWTSF. The fence is ~6 feet high and is of typical chain link construction.

2. Gates

There are a total of six gates at the HWTSF. Those gates designated as S-3 on Map #3 are kept locked at all times except when being used. Gates designated at S-2 on Map #2 allow access into and out of the HWTSF during normal working conditions. Gate S-2A is a 30-foot motorized gate at the main vehicle entrance. Gate S—2B is an electronic gate and used for personnel access. During after-hours the gates are locked.

Both the main entrance gate and the electronic personnel entry gate are designed such that when the evacuation siren is activated, the vehicle gate opens fully and the pedestrian gate unlocks to allow emergency egress from the HWTSF.

3. HWTSF Signs

Warning signs identifying the HWTSF as a hazardous waste site are placed around the perimeter of the site. These warning signs comply with CCR Title 22, §66265.14(c). Diagrams showing typical sign and lettering dimensions are given on Figure X-1. Signs are located on all gates that allow access. The signs are visible from all approaches to the HWTSF and are legible from a distance of 25 feet.

4. Lighting

The HWTSF is routinely operated during hours when natural light is sufficient for operations. For nighttime operations the HWTSF is equipped with light towers along the HWTSF perimeter fence. This

lighting provides sufficient artificial illumination for the entire HWTSE. The light activation switches and locations are shown on Map #3.

5. Hours of Operation

Currently, routine hours of operation are typically 7 a.m. to 4 p.m., Monday through Friday.

C. Vehicle Traffic at the HWTSE

1. Traffic Patterns and Control

Wastes are generally delivered to the HWTSE via Mill and Channel Streets. Trucks hauling wastes from the HWTSE to off-site facilities turn east onto Channel Street, travel about 1000 feet and turn right onto Xylene Street for about 500 feet, and then leave the Refinery area by exiting through controlled access Gate 31 onto Castro Street. Traffic on Channel Street is two-way and not congested so trucks encounter no significant delays in entering or leaving the HWTSE through the motorized sliding gate abutting Channel Street. No stacking lanes are required to facilitate traffic moving past or to or from the HWTSE.

There are no traffic signals or controls specifically provided for traffic associated with the HWTSE. The general traffic rules applicable to all traffic within the Refinery area are considered adequate for traffic associated with the HWTSE.

Access roads to the HWTSE are asphalt paved and designed and constructed to accommodate all truck wheel loads that may legally be used on public highways of California without special permits.

2. Estimated Volume of Traffic

Normal daily traffic within the HWTSE includes about six vacuum trucks. In addition, a flatbed truck makes approximately two trips per day into the HWTSE. A forklift is used to transfer drums from the flatbed truck to Area I, Storage for Drummed Waste.

During non-routine conditions, e.g., major unit shutdowns, traffic patterns to and from the HWTSE may significantly change. Up to 1,000 barrels of spent catalyst may be moved to the HWTSE in 24 to 80 drum loads. This results in an increase of from 13 to 40 additional vehicles over a period of a few days. If the material is being handled in bulk, the HWTSE may experience an increase of 5 to 15 vehicles carrying catalyst bins.

The daily maximum traffic that is expected is shown in the following table:

Truck Type	Max. Daily Volume	Max. Loaded Weight	Max. Waste Volume
Vacuum Trucks	10	40 Tons	130 Barrels
Small Flatbed	5	13 Tons	24 Barrels
Bin Trucks	8	26 Tons	20 Yd ³
Pick-up Truck	20	N/A	N/A

III. Personnel and Vehicle Entry to the HWTSF

Table of Contents

- A. Personnel Entry
- B. Vehicle Entry

List of Enclosures

Figure III-1 Entry Procedure Hazardous Waste Treatment and Storage Facility

III. Personnel and Vehicle Entry to the HWTSF

Figure III-1 is a copy of the typical HWTSF entry procedure.

A. Personnel Entry

- 1) Authorized personnel with access keys typically enter the HWTSF through one of two pedestrian gates or one of three vehicle gates. All visitors must receive permission from the HWTSF Supervisor, Chemical Cleaning Specialist or the HW Technician before entering the HWTSF. An intercom is used for identification of personnel and there are gate control buttons located in the HWTSF Supervisor's office.
- 2) PPE Requirements for HWTSF Entry (Personal Protective Equipment):
 - Visitors: Hard hats and safety glasses meeting OSHA requirements, along with long sleeves and appropriate shoes.
 - HWTSF Personnel Working Within or Around Hazardous Waste Treatment and Storage Areas: Fire retardant coveralls, appropriate shoes, safety glasses or goggles, gloves and a hard hat. See Section VII, Operating Procedures, for additional information on PPE.

Replacement supplies and/or additional supplies are available from storage locations within the HWTSF as indicated on Map #3.

B. Vehicle Entry

Access is typically via a 30-foot motorized gate at the main vehicle entrance (S-2A). Vehicles wait outside until the HWTSF Supervisor or other authorized personnel allow them access. Figure X-2 is a typical sign which can be found at the main vehicle entrance.

Figure III-1

**Example of a Typical Entry Procedure
Hazardous Waste Treatment and Storage Facility**

The following procedure is required to enter the Chevron, Richmond Refinery, Hazardous Waste Treatment and Storage Facility.

- 1) The two personnel and three vehicle gates to the HWTSF will remain closed and locked at all times. They will only be opened by authorized personnel to admit other operating personnel, to receive vehicles delivering approved waste materials, to allow the removal of treated or stored waste materials, and by qualified personnel responding to an emergency.
- 2) Controlled access keys are issued to Plant Protection, Emergency Coordinators, selected Hazardous Waste Section personnel and technicians, selected term contractors and HWTSF operators. Those personnel provided access keys may enter the HWTSF to perform their normal job duties.
- 3) Personnel not issued access keys must obtain approval from the HWTSF Supervisor, or designated back-up, to enter the HWTSF. At no time are the access keys to be duplicated or loaned to unauthorized personnel. If a key is lost, an investigation will be made to determine if a replacement key will be provided to that individual.

I _____ have read and understand the entry requirements for the HWTSF and agree to abide by all aspects of this procedure.

NAME

DATE

IV. Permit Completeness Checklist

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SECTION A.	PART A GENERAL INFORMATION REQUIREMENTS
SECTION B.	FACILITY DESCRIPTION
SECTION C.	WASTE CHARACTERISTICS
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	D2 – TANKS
	D3 – WASTE PILES
	D4 – SURFACE IMPOUNDMENTS
	D5 – INCINERATORS
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	D8 – MISCELLANEOUS TREATMENT
	D9 – BOILERS/INDUSTRIAL FURNACES
	D10 – CONTAINMENT BUILDINGS
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SECTION M.	ARTICLE 27, AIR EMISSION STANDARDS FOR PROCESS VENTS (SUBPART AA)
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SECTION O.	EMISSIONS STANDARDS
SECTION P.	EXPOSURE INFORMATION

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Facility Name: Chevron USA, Inc. . Richmond Refinery

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PERMIT COMPLETENESS CHECKLIST						
SECTION A. PART A GENERAL INFORMATION REQUIREMENTS						
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c	
A-1	Description of Activities Conducted which Require Facility to Obtain a Permit under the Resource Conservation and Recovery Act (RCRA), and Brief Description of Nature of the Business	270.13(a),(m)	66270.13(a),(m)		Part A Application	
A-2	Name, Mailing Address, and Location of Facility for which the Application is Submitted, including a Topographic Map	270.13(b),(l)	66270.13(b),(l)		Part A Application & Section XIV Map #1	
A-3	Up to Four Standard Industrial Classification Codes which Best Reflect the Products or Services Provided by the Facility	270.13(c)	66270.13(c)		Part A Application	
A-4	Operator/Owner's Name, Address, Telephone Number, and Ownership Status	270.13(d),(e)	66270.13(d),(e)	Ownership status must include status as federal, state, private, public, or other entity.	Part A Application	
A-5	Facility is New, Existing, or Located on Indian Lands	270.13(f),(g)	66270.13(f),(g)	Description must include information on whether this is a first or revised application with date of last signed permit application.	Part A Application	
A-6	Description of Processes to be Used for Treating, Storing, and Disposing of Hazardous Waste	270.13(i)	66270.13(i)	Description must include design capacity for these items.	Part A Application	

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Facility Name: Chevron USA, Inc. . Richmond Refinery

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PERMIT COMPLETENESS CHECKLIST						
SECTION A. PART A GENERAL INFORMATION REQUIREMENTS						
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c	
A-7	Specification of the Hazardous Wastes Listed or Designated Under CCR, chapter 11	270.13(j)	66270.13(j)	Specifications must include estimate on quantity of waste to be treated, stored, or disposed of.	Part A Application	
A-8	Listing of all Permits or Construction Approvals Received or Applied for	270.13(k)	66270.13(k)	Permits include the following programs: Hazardous Waste Management under RCRA; Underground Injection Control under the Solid Waste Disposal Act; Prevention of Significant Deterioration, Nonattainment Program, and National Emissions Standards for Hazardous Pollutants under the Clean Air Act; ocean dumping permits under the Marine Protection Research and Sanctuaries Act; dredge and fill permits under Section 404 of the Clean Water Act; or other relevant environmental permits including state permits.	Part A Application	

Notes:

- ^a Considerations in addition to the requirements presented in the regulations.
- ^b For each requirement, this column must indicate one of the following: NA for not applicable, IM for information missing, or the exact location of the information in the application.
- ^c If application is deficient in an area, prepare a comment describing the deficiency, attach it to the checklist, and reference the comment in this column.

SECTA.WPD

Reviewer: _____
Checklist Revision Date (March 1999)

RCRA I.D. No.: CAD009114919

Facility Name: Chevron USA, Inc. . Richmond Refinery

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PERMIT COMPLETENESS CHECKLIST

SECTION B. FACILITY DESCRIPTION

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
B-1 General Description	270.14(b)(1)	66270.14(b)(1)		Part A Application	
B-2 Topographic Map	270.14	66270.14(b)(18)	Show a distance of 1,000 feet around the unit at a scale of 1 inch to not more than 200 feet (multiple maps may be submitted at this scale), and should be similar to Part A topographic map.	Section XIV Map #1	
B-2a General Requirements	270.14(b)(19)	66270.14		Section XIV	
Scale and Date	270.14(b)(19)(i)	66270.14(b)(18)(A)	Other scales may be used if justified.	Section XIV	
The 100-Year Flood Plain Area	270.14(b)(19)(ii)	66270.14(b)(18)(B)		Section XIV	
Surface Waters	270.14(b)(19)(iii)	66270.14(b)(18)(C)		Section XIV	
Surrounding Land Use	270.14(b)(19)(iv)	66270.14(b)(18)(D)		Section XIV	
Wind Rose	270.14(b)(19)(v)	66270.14(b)(18)(E)		Section XIV	
Map Orientation	270.14(b)(19)(vi)	66270.14(b)(18)(F)		Section XIV	
Legal Boundaries	270.14(b)(19)(vii)	66270.14(b)(18)(G)		Section XIV	
Access Control	270.14(b)(19)(viii)	66270.14(b)(18)(H)		Section XIV	
Injection and Withdrawal Wells (On Site and Off Site)	270.14(b)(19)(ix)	66270.14(b)(18)(I)		Section XIV	

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PERMIT COMPLETENESS CHECKLIST

SECTION B. FACILITY DESCRIPTION

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
Buildings and Other Structures	270.14(b)(19)(x)	66270.14(b)(18)(J)	66270.14(b)(19)(x) for example list.	Section XIV	
Drainage and Flood Control Barriers	270.14(b)(19)(xi)	66270.14(b)(18)(K)		Section XIV	
Location of the Treatment or Disposal Unit(s) and Decontamination Areas	270.14(b)(19)(xii)	66270.14(b)(19)(L)		Section XIV	
Location of Solid Waste Management Units	270.14(d)(1)(i)	66270.14(d)(1)(A)		NA	
B-2b Additional Information on the Topographic Map for Land Disposal Facilities	270.14(c)(3)	66270.14(c)(3)		NA	
Uppermost Aquifer and Hydraulically Connected Aquifers Beneath Facility Property	270.14(c)(2)	66270.14(c)(2)		NA	
Groundwater Flow Direction	270.14(c)(2)	66270.14(c)(2)		NA	
Waste Management Areas	270.14(c)(3)	66270.14(c)(3)		NA	
Property Boundaries	270.14(c)(3)	66270.14(c)(3)		NA	
Point of Compliance Location	270.14(c)(3); 264.95	66270.14(c)(3); 66264.95	Point of compliance is defined in 66264.95.	NA	

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PERMIT COMPLETENESS CHECKLIST

SECTION B. FACILITY DESCRIPTION

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
Location of Groundwater Monitoring Wells	270.14(c)(3); 264.97	66270.14(c)(3); 66264.97		NA	
Extent of any Groundwater Contaminant Plume	270.14(c)(4)(i)	66270.14(c)(4)(A)		NA	
B-3 Facility Location Information	270.14(b)(11); 264.18	66270.14(b)(11); 66264.18		Section XV	
B-3a Seismic Requirements	270.14(b)(11)(i), (ii); 264.18(a)	66270.14(b)(11)(A); 66264.18(a)	Seismic requirements applicable only to new facilities.	Section XV	
Political Jurisdiction in which Facility is Proposed to be Located	270.14(b)(11)(i)	66270.14(b)(11)(A)		NA	
New Facility must be Located at Least 200 feet from a Fault which has had Displacement in Holocene Time	270.14(b)(11)(ii); 264.18(a)	66270.14(b)(11)(A); 66264.18(a)		NA	
B-3b Flood Plain Requirements	270.14(b)(11)(iii), (iv); 264.18(b)	66270.14(b)(11)(C), (D); 66264.18(b)		Section XVI	
Copy of Federal Insurance Administration or other Flood Map	270.14(b)(11)(iii)	66270.14(b)(11)(C)	Reference source used to determine whether facility is located in 100-year flood plain.	Section XIV	

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Facility Name: Chevron USA, Inc. . Richmond Refinery

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PERMIT COMPLETENESS CHECKLIST

SECTION B. FACILITY DESCRIPTION

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
B-3b(1) Demonstration that Facility is Designed, Constructed, Operated, and Maintained to Prevent Washout, or Detailed Description of Procedures to be Followed to Remove Hazardous Waste to Safety before Facility is Flooded	270.14(b)(11)(iv); 264.18(b)	66270.14(b)(11)(D); 66264.18(b)	Flood plain requirements applicable if facility is located in 100-year flood plain.	NA	
B-3b(1)(a) Engineering Analysis to Indicate the Various Hydrodynamic and Hydrostatic Forces Expected to Result from the 100-Year Flood Plain	270.14(b)(11)(iv); 264.18(b)	66270.14(b)(11)(D); 66264.18(b)	Flood plain requirements applicable if facility is located in 100-year flood plain.	NA	
Demonstration that no Adverse Effects will Result from Failure to Remove Waste by Providing:	270.14(b)(11)(iv); 264.18(b)(1)	66270.14(b)(11)(D); 66264.18(b)(1)	Flood plain requirements applicable if facility is located in 100-year flood plain.	NA	
Volume and Physical and Chemical Characteristics of the Waste in the Facility	270.14(b)(11)(iv); 264.18(b)(1)(ii)(A)	66264.18(b)(1)	Flood plain requirements applicable if facility is located in 100-year flood plain.	NA	

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PERMIT COMPLETENESS CHECKLIST					
SECTION B. FACILITY DESCRIPTION					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
Concentration of Hazardous Constituents that Would Potentially Affect Surface Waters as a Result of Washout	270.14(b)(11)(iv); 264.18(b)(ii)(B)	66264.18(b)	Flood plain requirements applicable if facility is located in 100-year flood plain.	NA	
Impact of such Concentration on Current or Potential uses of, and Water Quality Standards Established for, the Affected Surface Waters	270.14(b)(11)(iv); 264.18(b)(ii)(C)	66264.18(b)	Flood plain requirements applicable if facility is located in 100-year flood plain.	NA	
Impact of Hazardous Constituents on the Sediments of Affected Surface Waters, or the Soils of the 100-Year Flood Plain, that could Result from Washout	270.14(b)(11)(iv); 264.18(b)(ii)(D)	66264.18(b)	Flood plain requirements applicable if facility is located in 100-year flood plain.	NA	
Plan and Schedule for Future Compliance	270.14(b)(11)(v)	66270.14(b)(11)(E)	Flood plain requirements applicable if facility is located in 100-year flood plain and not in compliance with 66264.18(b).	NA	
B-4 Traffic Patterns	270.14(b)(10)	66270.14(b)(10)	Show turns across traffic lanes and stacking lanes, if appropriate.	Section II-C	

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PERMIT COMPLETENESS CHECKLIST					
SECTION B. FACILITY DESCRIPTION					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
Estimate of Number and Types of Vehicles around the Facility	270.14(b)(10)	66270.14(b)(10)		Section II-C	
Traffic Control Signs and Signals	270.14(b)(10)	66270.14(b)(10)		Section II-C	
Road Surface Composition and Load-Bearing Capacity	270.14(b)(10)	66270.14(b)(10)		Section II-C	

Notes:

- ^a Considerations in addition to the requirements presented in the regulations.
- ^b For each requirement, this column must indicate one of the following: NA for not applicable, IM for information missing, or the exact location of the information in the application.
- ^c If application is deficient in an area, prepare a comment describing the deficiency, attach it to the checklist, and reference the comment in this column.

SECTB.WPD

Reviewer: _____
 Checklist Revision Date (March 1999)

RCRA I.D. No.: CAD009114919Facility Name: Chevron USA, Inc. . Richmond Refinery

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PERMIT COMPLETENESS CHECKLIST

SECTION C. WASTE CHARACTERISTICS

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
C-1 Chemical and Physical Analyses	270.14(b)(2); 264.13(a)	66270.14(b)(2); 66264.13(a)	Data generated by testing the waste, published data on the waste, or data gathered from similar processes may be used.	Table VIII-1	
C-1a Containerized Waste	270.15(b)(1); 264.172	66270.15(b); 66264.172	Demonstrate that waste is compatible with container construction materials and the location is in compliance with the buffer zone requirements.	Section VII-C and Table VIII-2	
C-1b Waste in Tank Systems	270.16(a); 264.190(a); 264.191(b)(2); 264.192(a)(2)	66270.16(a); 66264.190(a); 66264.192(c)(2)	A written assessment by an independent engineer to demonstrate that tank construction materials are compatible with waste stored in tank.	NA	
C-1c Waste in Piles	270.18(a); 264.250(c)(1), (4)	66270.18(a); 66264.250(c)(1), (4)		NA	
C-1d Landfilled Wastes	270.21(a) 264.13(c)(3); 264.314	66270.21(a) 66264.314	Demonstrate that sorbent materials are non-biodegradable.	NA	
C-1e Wastes Incinerated and Wastes used in Performance Tests	270.19(c); 270.62(b); 264.341	66270.19(c); 66270.62(b); 66264.341		NA	
C-1f Wastes to be Land Treated	270.20(b)(4); 264.271(a)(1), (2); 264.272; 264.276, Part 261 Appendix VIII	66270.20(b)(4); 66264.271(a)(1), (2); 66264.272; Chapter 11 Appendix VIII	If food-chain crops will be grown in or on treatment zone, identify hazardous constituents reasonably expected to be in or derived from waste.	NA	
C-1g Wastes in Miscellaneous Treatment Units	270.23(d)	66270.23(d)	Demonstrate the effectiveness of the treatment.	NA	

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PERMIT COMPLETENESS CHECKLIST					
SECTION C. WASTE CHARACTERISTICS					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
C-1h	Wastes in Boilers and Industrial Furnaces	270.66(c); 266.102(b)	66270.66(c); 66266.102(b)	NA	
C-1i	Wastes on Drip Pads	270.26; 264.570	66270.26; 66264.570	NA	
C-2	Waste Analysis Plan	270.14(b)(3); 264.13(b),(c)	66270.14(b)(3); 66264.13(b),(c)	Waste Analysis Plan should be provided in a table format that clearly shows the fingerprint and Waste Profile analyses that will be conducted for each waste stream, the waste management units that will be managing wastes, any applicable concentration limits, sampling methods, etc.	Section VIII
C-2a	Parameters and Rationale	270.14(b)(3); 264.13(b)(1)	66270.14(b)(3); 66264.13(b)(1)	Table VIII-1	
C-2b	Test Methods	270.14(b)(3); 264.13(b)(2)	66270.14(b)(3); 66264.13(b)(2)	Table VIII-1	
C-2c	Sampling Methods	270.14(b)(3); 264.13(b)(3)	66270.14(b)(3); 66264.13(b)(3)	Section VIII-B	
C-2d	Frequency of Analyses	270.14(b)(3); 264.13(b)(4)	66270.14(b)(3); 66264.13(b)(4)	Table VIII-1	
C-2e	Additional Requirements for Wastes Generated Off Site	270.14(b)(3); 264.13 (b)(5), (c); 264.73(b)	66270.14(b)(3); 66264.13 (b)(5), (c); 66264.73(b)	Describe statistical method used to determine a representative sample of incoming waste.	NA
C-2f	Additional Requirements for Ignitable, Reactive, or Incompatible Wastes	270.14(b)(3); 264.13(b)(6); 264.17	66270.14(b)(3); 66264.13(b)(6); 66264.17	Table VIII-1 & Section VII-C	

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PERMIT COMPLETENESS CHECKLIST					
SECTION C. WASTE CHARACTERISTICS					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
C-2g Additional Requirements Pertaining to BIF Facilities	270.22; 266.102(e)(6)(ii) (C),(e)(6)(iii)	66270.22; 66266.102(e)(6)(B)3.(e)(6)(C)		NA	
C-3 Waste Analysis Requirements Pertaining to Land Disposal Restrictions	270.14(b)(3); 264.13; 264.73; Part 268	66270.14(b)(3); 66264.13; 264.73; Chapter 18		NA	
C-3a Waste Analysis	270.14(a); 264.13(a)(1); 268.1; 268.7; 268.9; 268.32 - 268.37; 268.41 - 268.43	66270.14(a); 66264.13(a)(1); 66268.1; 66268.9; 66268.32 - 66268.37; 66268.41 - 66268.43		NA	
C-3a(1) Spent Solvent and Dioxin Wastes	270.14(a); 264.13(a)(1); 268.2(f)(1); 268.7; 268.30; 268.31	66270.14(a); 66264.13(a)(1); 66268.30; 66268.31		NA	
C-3a(2) California List Wastes	270.14(a); 264.13(a)(1); 268.7; 268.32; 268.42(a); RCRA Section 3004(d)	66270.14(a); 66264.13(a)(1); 66268.32; 66268.42(a)		NA	
C-3a(3) Listed Wastes	270.14(a); 264.13(a)(1); 268.7; 268.33 - 268.36; 268.41 - 268.43	66270.14(a); 66264.13(a)(1); 66268.33 - 66268.36; 66268.41 - 66268.43		NA	

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SECTION C. WASTE CHARACTERISTICS					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
C-3a(4) Characteristic Wastes	270.14(a); 264.13(a)(1); 268.7, 268.9; 268.37; Part 268 Appendix I, IX	66270.14(a); 66264.13(a)(1); 66268.9; 66268.37; Chapter 18, Appendix I, VIII	Characteristic D008 lead nonwastewater and D004 arsenic nonwastewater may use EP toxicity test to determine compliance with treatment standards.	NA	
C-3a(5) Radioactive Mixed Waste	270.14(a); 264.13(a); 268.7; 268.35(c),(d); 268.36(d); 268.42(d)	66270.14(a); 66264.13(a); 66268.35(c),(d); 66268.36(d); 66268.42(d)	Hazardous debris containing radioactive waste must comply with treatment standards specified in 66268.45.	NA	
C-3a(6) Leachates	270.14(a); 264.13(a); 268.35(a)	66270.14(a); 66264.13(a); 66268.35(a)	Leachate that originates from newly identified waste is not coded as F039 waste, but is labeled with newly listed waste code from which it is derived.	NA	
C-3a(7) Lab Packs	270.14(a); 264.13(a); 268.7(a)(7),(8); 268.42(c); Part 268 Appendix IV	66270.14(a); 66264.13(a); 66268.42(c); Chapter 18 Appendix IV	Lab packs containing California list polychlorinated biphenyls (PCB) or dioxins must be treated according to special incineration requirements detailed in 268.42(a).	NA	
C-3a(8) Contaminated Debris	270.13(n); 268.2(g); 268.7; 268.9; 268.36; 268.45	66270.13(n); 66268.9; 66268.36; 66268.45		NA	
C-3a(9) Waste Mixtures and Wastes with Overlapping Requirements	270.14(a); 264.13(a)(1); 268.7; 268.9; 268.41; 268.43; 268.45(a)	66270.14(a); 66264.13(a)(1); 66268.9; 66268.41; 66268.43; 66268.45(a)	Waste that carries more than one characteristic or listed waste code must be treated to the most stringent treatment requirement for each hazardous waste constituent of concern.	NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
C-3a(10) Dilution and Aggregation of Wastes	270.14(a); 268.3	66270.14(a); 66268.3		NA	
C-3b Notification, Certification, and Recordkeeping Requirements	270.14(a); 264.13; 264.73; 268.7; 268.9(d)	66270.14(a); 66264.13; 66264.73; 66268.7 66268.9		NA	
C-3b(1) Retention of Generator Notices and Certifications	270.14(a); 264.13; 268.7(a)	66270.14(a); 66264.13; 66268.7(a)		Section XII-A, Section XII-B	
C-3b(2) Notification and Certification Requirements for Treatment Facilities	270.14(a); 264.13; 268.7(b)	66270.14(a); 66264.13; 66268.7(b)		Section XII-D, Table VIII-1	
C-3b(3) Notification and Certification Requirements for Land Disposal Facilities	270.14(a); 264.13; 268.7(c)(1)	66270.14(a); 66264.13; 66268.7(c)(1)		Section XIX	
C-3b(4) Wastes Shipped to Subtitle C Facilities	270.14(a); 264.13; 268.7(a),(b)(6)	66270.14(a); 66264.13; 66268.7(a),(b)(6)		NA, We do not receive hazardous waste from offsite	
C-3b(5) Wastes Shipped to Subtitle D Facilities	270.14(a); 264.13; 268.7(d); 268.9(d)	66270.14(a); 66264.13; 66268.7(d); 66268.9(d)		NA	

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SECTION C. WASTE CHARACTERISTICS

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
C-3b(6) Recyclable Materials	270.14(a); 264.13; 268.7(b)(7)	66270.14(a); 66264.13; 66268.7(b)(7)		NA	
C-3b(7) Recordkeeping	270.14(a); 264.13; 264.73; 268.7(a) (5),(a)(6),(a)(7), (d)	66270.14(a); 66264.13; 264.73; 66268.7(a) (5),(a)(6),(a)(7), (d)	Recycling facilities must keep records of name and location of each entity receiving hazardous waste-derived product.	NA	
C-3c Requirement Pertaining to the Storage of Restricted Wastes	270.14(a); 264.73; 268.50	66270.14(a); 66264.73; 66268.50		Section XII-B	
C-3c(1) Restricted Wastes Stored in Containers	270.14(a); 264.73; 268.50(a)(2)(i)	66270.14(a); 66264.73; 66268.50(a)(2)(A)		Section VII-C	
C-3c(2) Restricted Wastes Stored in Tanks	270.14(a); 264.73; 268.50(a)(2)(ii)	66270.14(a); 66264.73; 66268.50(a)(2)(B)		NA	
C-3c(3) Storage of Liquid PCB Wastes	270.14(a); 264.73; 268.50(f)	66270.14(a); 66264.73; 66268.50(f)		Section VIII-2, Table VIII-1	
C-3d Exemptions, Extensions, and Variances to Land Disposal Restrictions				NA	
C-3d(1) Case-by-Case Extensions to an Effective Date	270.14(b)(21); 268.5	66270.14(b)(20); 66268.5		NA	
C-3d(2) Exemption from Prohibition	270.14(b)(21); 268.6	66270.14(b)(20); 66268.6		NA	

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SECTION C. WASTE CHARACTERISTICS					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
C-3d(3) Variance from a Treatment Standard	270.14(a); 264.73; 268.7; 268.44	66270.14(a); 66264.73; 66268.7; 66268.44		NA	
C-3d(4) Requirements for Surface Impoundments Exempted from Land Disposal Restrictions	270.14(a); 264.13(b)(7); 268.4; 268.14	66270.14(a)		NA	
C-3d(4)(a) Exemption for Newly Identified or Listed Wastes	270.14(a); 264.13; 268.14	66270.14(a); 66264.13		NA	
C-3d(4)(b) Treatment of Wastes	270.14(a); 264.13; 268.4(a)(1),(b)	66270.14(a); 66264.13		NA	
C-3d(4)(c) Sampling and Testing	270.14(a); 264.13(b)(6); 268.4(a)(2)(i),(iv)	66270.14(a); 66264.13		NA	
C-3d(4)(d) Annual Removal of Residues	270.14(a); 264.13(b)(7)(iii); 268.4(a)(2)(ii)	66270.14(a); 66264.13		NA	
C-3d(4)(e) Design Requirements	270.14(a); 264.13; 268.4(a)(3),(4)	66270.14(a); 66264.13		NA	

Notes:

- ^a Considerations in addition to the requirements presented in the regulations.
- ^b For each requirement, this column must indicate one of the following: NA for not applicable, IM for information missing, or the exact location of the information in the application.
- ^c If application is deficient in an area, prepare a comment describing the deficiency, attach it to the checklist, and reference the comment in this column.

SECTC.WPD

Reviewer: _____

Checklist Revision Date (March 1999)

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SECTION D. PROCESS INFORMATION - CONTAINERS					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
D-1 Containers	270.15; 264.170	66270.15; 66264.170	Applicability		
D-1a Containers with Free Liquids	270.15; 264.175(a),(b)	66270.15; 66264.175(a),(b)	Containers storing waste with free liquids must meet secondary containment requirements of 66264.175(b).	Table VIII-2	
D-1a(1) Description of Containers	270.15(a)(3); 264.171,172	66270.15(a)(3); 66270.14(b)(1); 66264.171,172	Specify numbers of containers, sizes, and specifications.	Table VII-2, Table V-1	
D-1a(2) Container Management	264.173	66264.171; 66264.173; 66270.15(b), (c)	Containers must be kept closed and must not be handled in any manner which could cause them to rupture or leak. Specify aisle space and stacking height.	Section VII-C	
D-1a(3) Secondary Containment System Design and Operation	270.15(a)(1); 264.175(a)-(d)	66270.15(a)(1); 66264.175(a)-(d)	Provide detailed design and profile drawings showing container storage areas.	Attachment VIII-1 & 2, Maps 2, 10-13	
D-1a(3)(a) Requirement for the Base or Liner to Contain Liquids	264.175(b)(1)	66264.175(b)(1)	Demonstrate that base is impervious to waste stored and precipitation.	Table VIII-2	
D-1a(3)(b) Containment System Drainage	270.15(a)(2); 264.175(b)(2)	66270.15(a)(2); 66264.175(b)(2)	Containment system must be designed and operated to remove liquids resulting from leaks, spills, or precipitation.	Table VIII-2	
D-1a(3)(c) Containment System Capacity	270.15(a)(3); 264.175(b)(3)	66270.15(a)(3); 66264.175(b)(3)	Containment system must have capacity to hold 10 percent of container volume or volume of the largest container, whichever is greater.	Table VIII-2, Map #2, Attachment VIII 1 & 2.	

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SECTION D. PROCESS INFORMATION - CONTAINERS					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
D-1a(3)(d) Control of Runon	270.15(a)(4); 264.175(b)(4)	66270.15(a)(4); 66264.175(b)(4)	Runon from storm water must be prevented unless containment system has sufficient excess capacity.	Table VIII-2	
D-1a(3)(e) Removal of Liquids from Containment System	270.15(a)(5); 264.175(b)(5)	66270.15(a)(5); 66264.175(b)(5)	Accumulated liquids must be removed in timely manner to prevent containment system from overflowing.	Table VIII-2	
D-1b Containers without Free Liquids	270.15(b); 264.175(c) and (d)	66264.175(d) and (e)		We do not use this provision.	
D-1b(1) Test for Free Liquids	270.15(b)(1)	66270.15	Documentation that waste does not contain free liquids must be provided by test results or other information.	We do not use this provision.	
D-1b(2) Description of Containers (without free liquid)	264.171; 264.172	66264.171; 66264.172	Describe numbers, sizes, and specifications of containers.	We do not use this provision.	
D-1b(3) Container Management Practices (without free liquid)	264.173	66270.14(a); 66264.173	Same comment as D-1a(2).	We do not use this provision.	
D-1b(4) Container Storage Area Drainage (w/o free liquid)	270.15(b)(2); 264.175(c)(1)	66264.175(b)	Same comment as D-1a(3)(b).	We do not use this provision.	

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Reviewer: _____

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Sections D2 Through E Do Not Apply
To The Treatment and Storage Facility
at the Chevron Richmond Refinery

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PERMIT COMPLETENESS CHECKLIST

SECTION F. PROCEDURES TO PREVENT HAZARDS

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
F-1a Waiver	270.14(b)(4); 264.14	66270.14(b)(4); 66264.14	Owner/operator must prevent unknowing entry, and minimize unauthorized entry of persons or livestock unless can demonstrate:	NA	
F-1a(1) Injury to Intruder	270.14(b)(4); 264.14	66270.14(b)(4); 66264.14(a)(1)	Assure physical contact with waste, structure, or equipment will not injure unknowing intruder.	NA	
F-1a(2) Violation Caused by Intruder	270.14(b)(4); 264.14	66270.14(b)(4); 66264.14(a)(2)	Assure disturbance of waste or equipment by unauthorized intruder will not cause a violation.	NA	
F-1b Security Procedures and Equipment	270.14(b)(4); 264.14	66270.14(b)(4); 66264.14	Unless waiver is granted, facility must have surveillance system or a barrier to entry.	Section II-A, Section II-B	
F-1b(1) 24-Hour Surveillance System	270.14(b)(4); 264.14	66270.14(b)(4); 66264.14(b)(1)	Monitor/camera, guards, or personnel must continuously monitor or control access to active parts of facility.	Section II-A	
F-1b(2)(a) Barrier	270.14(b)(4); 264.14	66270.14(b)(4); 66264.14(b)(2)(A)	This item required if 24-hour surveillance system is not feasible. Describe artificial or natural barrier.	Section II-B	
F-1b(2)(b) Means to Control Entry	270.14(b)(4); 264.14	66270.14(b)(4); 66264.14(b)(2)(B)	This item required if 24-hour surveillance system is not feasible.	Section II-A	
F-1b(3) Warning Signs	270.14(b)(4); 264.14	66270.14(b)(4); 66264.14	Signs in English must be posted at each entrance, and be legible from 25 feet.	Section II-B	
F-2 Inspection Schedule	270.14(b)(5); 264.15	66270.14(b)(5); 66264.15	Inspection is required for monitoring equipment, safety emergency equipment, communication and alarm systems, decontamination equipment, security devices, and operating and structural equipment.	Section X	

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SECTION F. PROCEDURES TO PREVENT HAZARDS

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
F-2a General Inspection Requirements	270.14(b)(5); 264.15(a),(b); 264.33	66270.14(b)(5); 66264.15(a),(b); 66264.33		Section X-A	
F-2a(1) Types of Problems	270.14(b)(5); 264.15(b)(3)	66270.14(b)(5); 66264.15(b)(3)	Inspection checklist must identify types of problem.	Attachment X-1	
F-2a(2) Frequency of Inspections	270.14(b)(5); 264.15(b)(4)	66270.14(b)(5); 66264.15(b)(4)	Based on rate of deterioration of equipment and probability of environmental or human health incident.	Section X-A	
F-2a(3) Schedule of Remedial Action	270.14(b)(5); 264.15(c)	66270.14(b)(5); 66264.15(c)	Owner/operator must immediately remedy any deterioration or malfunction of equipment or structures to ensure problem does not lead to environmental or human health hazard.	Section X-A	
F-2a(4) Inspection Log	270.14(b)(5); 264.15(d)	66270.14(b)(5); 66264.15(d)	Provide example log or summary.	Attachment X-1	
F-2b Specific Process Inspection Requirements	270.14(b)(5)	66270.14(b)(5)		Section X-C	
F-2b(1) Container Inspection	270.14(b)(5); 264.174	66270.14(b)(5); 66264.174	Inspect at least weekly.	Section X-B	
F-2b(2) Tank System Inspection	270.14(b)(5); 264.195	66270.14(b)(5); 66264.195(a)	Owner/operator must develop schedule and inspect at least once daily.	NA	
F-2b(2)(a) Tank System External Corrosion and Releases	270.14(b)(5); 264.195(b)(1)	66270.14(b)(5); 66264.195(b)(1)	Owner/operator must inspect that aboveground portion and check for corrosion.	NA	
F-2b(2)(b) Tank System Construction Materials and Surrounding Area	270.14(b)(5); 264.195(b)(3)	66270.14(b)(5); 66264.195(b)(3)	Observe construction materials and area around external portion for signs of release of hazardous waste.	NA	
F-2b(2)(c) Tank System Overfilling Control Equipment	270.14(b)(5); 264.195(a)	270.14(b)(5); 66264.195(a)	Develop and follow schedule for inspection of overfill controls.	NA	

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SECTION F. PROCEDURES TO PREVENT HAZARDS

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
F-2b(2)(d) Tank System Monitoring and Leak Detection Equipment	270.14(b)(5); 264.195(b)(2)	66270.14(b)(5); 66264.195(b)(2)	Analyze data gathered from monitoring equipment to ensure tank is operating according to design.	NA	
F-2b(2)(e) Tank System Cathodic Protection	270.14(b)(5); 264.195(c)	66270.14(b)(5); 66264.195(c)	Inspect according to schedule.	NA	
F-2b(3) Waste Pile Inspection	270.14(b)(5); 270.18(d); 264.254(b)	66270.14(b)(5); 66270.18(d); 66264.254(b)	Describe how waste pile will be inspected weekly and after storms.	NA	
F-2b(3)(a) Runon and Runoff Control System	270.14(b)(5); 264.254(b)(1)	66270.14(b)(5); 66264.254(b)(1)	Inspections should identify deterioration, malfunction, or improper operation of control system.	NA	
F-2b(3)(b) Wind Dispersal System	270.14(b)(5); 264.254(b)(2)	66270.14(b)(5); 66264.254(b)(2)	Facility should inspect proper function of wind dispersal system.	NA	
F-2b(3)(c) Leachate Collection and Removal System	270.14(b)(5); 270.18 (d); 264.254(b)(3), (c)	66270.14(b)(5); 66270.18 (d); 66264.254(b)(3), (c)	Determine whether there is leachate present in functioning double liner system.	NA	
F-2b(4) Surface Impoundment Inspection	270.14(b)(5); 270.17(c); 264.226(b),(c)	66270.14(b)(5); 66270.17(c); 66264.226(b),(c)	Describe how each surface impoundment will be inspected to meet requirements of monitoring and inspection and waiver requirement.	NA	
F-2b(4)(a) Condition Assessment	270.14(b)(5); 264.226(b)	66270.14(b)(5); 66264.226(b)	Describe how surface impoundment will be inspected weekly and after storms.	NA	
F-2b(4)(a)(1) Overtopping Control System	270.14(b)(5); 264.226(b)(1)	66270.14(b)(5); 66264.226(b)(1)	Inspect for deteriorating, malfunction, or improper operation of control system.	NA	
F-2b(4)(a)(2) Impoundment Contents	270.14(b)(5); 264.226(b)(2)	66270.14(b)(5); 66264.226(b)(2)	Inspect for sudden drop in level of impoundment contents.	NA	

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SECTION F. PROCEDURES TO PREVENT HAZARDS					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
F-2b(4)(a)(3)Dikes and Containment Devices	270.14(b)(5); 264.226(b)(3)	66270.14(b)(5); 66264.226(b)(3)	Inspect for severe erosion in containment devices.	NA	
F-2b(4)(b)Structural Integrity	270.14(b)(5); 264.226(c)	66270.14(b)(5); 66264.226(c)	Specify procedure for assessing integrity of surface impoundments.	NA	
F-2b(4)(c)Leak Detection System	270.14(b)(5); 270.17(c); 264.226(d)	66270.14(b)(5); 66270.17(c); 66264.226(d)	Describe how double liner system and leak detection system will be inspected.	NA	
F-2b(5)(a)Incinerator and Associated Equipment	270.14(b)(5); 264.347(b)	66270.14(b)(5); 66264.347(b)	Describe procedures for daily visual inspection of incinerator and associated equipment.	NA	
F-2b(5)(b)Incinerator Waste Feed Cutoff System and Alarms	270.14(b)(5); 264.347(c)	66270.14(b)(5); 66264.347(c)	Describe procedure and frequency of testing emergency waste feed cutoff system.	NA	
F-2b(6)Landfill Inspection	270.14(b)(5); 264.303(b)	66270.14(b)(5); 66264.303(b)	For operating landfill, describe how it will be inspected weekly and after storms.	NA	
F-2b(6)(a)Runon and Runoff Control System	270.14(b)(5); 264.303(b)(1)	66270.14(b)(5); 66264.303(b)(1)	Deterioration, malfunction, or improper operation of runon and runoff control system.	NA	
F-2b(6)(b)Wind Dispersal Control System	270.14(b)(5); 264.303(b)(2)	66270.14(b)(5); 66264.303(b)(2)	Proper functioning of wind dispersal control systems, where present.	NA	
F-2b(6)(c)Leachate Collection and Removal System	270.14(b)(5); 264.303(b)(3), (c)	66270.14(b)(5); 66264.303(b)(3), (c)	In properly functioning double liner system, is there a presence of leachate? Leak detection required under 66264.301(c) or 66264.301(d) must record amount of leakage from each system weekly.	NA	
F-2b(7)Land Treatment Facility Inspection	270.14(b)(5); 264.273(g)	66270.14(b)(5); 66264.273(g)	Describe how land treatment facility will be inspected weekly and after storms.	NA	
F-2b(7)(a)Runon and Runoff Control System	270.14(b)(5); 264.273(g)(1)	66270.14(b)(5); 66264.273(g)(1)		NA	

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PERMIT COMPLETENESS CHECKLIST					
SECTION F. PROCEDURES TO PREVENT HAZARDS					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
F-2b(7)(b)Wind Dispersal Control System	270.14(b)(5); 264.273(g)(2)	66270.14(b)(5); 66264.273(g)(2)		NA	
F-2b(8)Miscellaneous Unit Inspections	270.14(b)(5); 264.602	66270.14(b)(5); 66264.602	Provide inspection program that ensures compliance with standards in 66264.601 and 66270.23.	NA	
F-2b(9)Boilers and Industrial Furnaces (BIF) Inspection	270.14(b)(5); 264.15; 266.102(a)(2) (ii),(e)(8); 266.111(e)(3)	66270.14(b)(5); 66264.15; 66266.102(a)(2) (B),(e)(8); 66266.111(e)(3)	Demonstrate that BIF will be visually inspected daily, automatic waste feed cutoff inspected at least weekly, and direct transfer area at least once an hour when waste is being transferred.	NA	
F-2b(10)Containment Building Inspection	270.14(b)(5); 264.1101(c)(3), (4)	66270.14(b)(5); 66264.1101(c)(3), (4)	Demonstrate owner/operator will inspect and document at least weekly, monitoring equipment, leak detection equipment, containment building, and surrounding areas for waste releases.	NA	
F-2b(11)Drip Pad Inspection	270.14(b)(5); 264.574	66270.14(b)(5); 66264.574	Demonstrate that the drip pad owner/operator will inspect and document at least weekly and after storms, the leak detection and collection equipment, the drip pad surface, and the runoff and runoff control systems for evidence of deterioration, malfunction, improper operation, or leakage of hazardous waste.	NA	
F-3Waiver or Documentation of Preparedness and Prevention Requirements	270.14(b)(6) 264.32(a) - (d)	66270.14(b)(6) 66264.32(a) - (d)	Facility must submit justification for any waiver to requirements of this section.	NA	
F-3(a) Equipment Requirements	270.14(b); 264.32	66270.14(b); 66264.32		Section VI	

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SECTION F. PROCEDURES TO PREVENT HAZARDS					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
F-3(a)(1) Internal Communication	270.14(b); 264.32(a)	66270.14(b); 66264.32(a)	Describe internal communication or alarm system used to provide immediate emergency instruction to personnel.	Section VI-B	
F-3(a)(2) External Communication	270.14(b); 264.32(b)	66270.14(b); 66264.32(b)	Describe device for summoning emergency assistance from local police, fire, or state/local emergency response.	Section VI-B	
F-3(a)(3) Emergency Equipment	270.14(b); 264.32(c)	66270.14(b); 66264.32(c)	Demonstrate that portable fire extinguishers, fire control equipment, spill control equipment, and decontamination equipment are available.	Tables VI-1 & VI-2	
F-3(a)(4) Water and Fire Control	270.14(b); 264.32(d)	66270.14(b); 66264.32(d)	Demonstrate facility has adequate fire control systems, water volume and pressure, foaming equipment, automatic sprinklers, etc.	Section VI-D	
F-3(a)(5) Testing and Maintenance of Equipment	270.14(b); 264.33	66270.14(b); 66264.33	Demonstrate communication, alarm, fire control equipment, spill control equipment, and decontamination equipment are tested and maintained.	Section X-D	
F-3(a)(6) Access to Communication or Alarm System	270.14(b); 264.34	66270.14(b); 66264.34	When waste is being hauled, all personnel must have access to internal alarm or communication device.	Section VI-B	
F-3(b) Aisle Space Requirement	270.14(b); 264.35	66270.14(b); 66264.35	Aisle space is required for unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment in case of emergency.	Section VII-C	
F-3(c) Documentation of Arrangements with:	270.14(b); 264.37	66270.14(b); 66264.37	Owner/operator must make arrangements, as appropriate, with type of waste and hazard potential, for the potential need for services.	Section XIII-9	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
F-3(c)(1) Police/Fire Department	270.14(b); 264.37(a)(1)	66270.14(b); 66264.37(a)(1)	Arrange to familiarize local fire department and police with facility.	Section XIII-9	
F-3(c)(2) Emergency Response Teams	270.14(b); 264.37(a)(2), (a)(3)	66270.14(b); 66264.37(a)(2), (a)(3)		Section XIII-3	
F-3(c)(3) Local Hospitals	270.14(b); 264.37(a)(4)	66270.14(b); 66264.37(a)(4)	Arrange to familiarize local hospital with properties of hazardous waste and possible types of injury or illness to expect.	Section XIII-9	
F-3(c)(4) Document Agreement Refusal	270.14(b); 264.37(b)	66270.14(b); 66264.37(b)	Document refusal to enter into a coordination agreement.	NA	
F-4 Prevention Procedures, Structures, and Equipment	270.14	66270.14		Section VII	
F-4(a) Unloading Procedures	270.14(b)(8)(i)	66270.14(b)(8)(A)	Describe procedure used to prevent hazards in unloading operations. Identify possible loading and unloading hazards, and document steps taken to minimize or eliminate possibility of these hazards.	Table V-2, Section VII-C	
F-4(b) Runoff	270.14(b)(8)(ii)	66270.14(b)(8)(B)	Describe procedure used to prevent runoff from hazardous waste handling areas.	Table VIII-2	
F-4(c) Water Supplies	270.14(b)(8) (iii)	66270.14(b)(8) (C)	Describe procedure, structures, equipment used to prevent contamination of water supply.	Section VI-D	
F-4(d) Equipment and Power Failure	270.14(b)(8) (iv)	66270.14(b)(8) (D)	Describe procedure used to mitigate the effects of equipment failure and power outages.	Section VI-B	
F-4(e) Personnel Protection Procedures	270.14(b)(8)(v)	66270.14(b)(8)(E)	Describe procedure, structures, equipment used to prevent contamination of personnel to hazardous waste.	Section VII-A	

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SECTION F. PROCEDURES TO PREVENT HAZARDS					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
F-4(f) Procedures to Minimize Releases to the Atmosphere	270.14(b)(8)(vi)	66270.14(b)(8)(F)	Describe procedure, structures, equipment used to prevent hazardous waste releases to the atmosphere.	Section VII-D	
F-5 Prevention of Reaction of Ignitable, Reactive, and Incompatible Waste	270.14(b)(9)	66270.14(b)(9)		VII-C	
F-5a Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Wastes	270.14(b)(9); 264.17(a),(b)	66270.14(b)(9); 66264.17(a),(b)	Waste must be protected from sources of ignition or reaction. Describe precautions taken by facility to prevent actual ignition, including sources of spontaneous ignition and radiant heat. Owner/operator must designate safe areas for smoking and open flames. Post signs where hazard exists.	Section VII-C	
F-5b General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste	270.14(b)(9); 264.17(a)	66270.14(b)(9); 66264.17(a)	Describe precautions taken by facility to prevent reactions that generate heat, produce flammable byproducts, cause risk of fire or explosion, threaten structural integrity, or pose threat to human life or the environment.	Section VII-C	
F-5b(1) Documentation of Adequacy of Procedures	270.14(b); 264.17(c)	66270.14(b); 66264.17(c)	Published literature, trial test, waste analyses, or similar processes may be used.	Table VIII-1, Section VII-C	
F-5c Management of Ignitable or Reactive Wastes in Containers	270.15(c); 264.176	66270.15(b); 66264.176	Demonstrate that ignitable containers are at least 15 meters from facility property line.	Section VII-C, Map #4	
F-5d Management of Incompatible Wastes in Containers	270.15(d); 264.177	66270.15(c); 66264.177	Describe procedures that ensure incompatible wastes and materials are not placed in same container.	Section VII-C	

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SECTION F. PROCEDURES TO PREVENT HAZARDS

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
F-5e Management of Ignitable or Reactive Wastes in Tank Systems	270.16(j); 264.198	66270.16(j); 66264.198	Describe operation procedures and how facility treats waste so it is no longer ignitable or how facility stores ignitable or reactive waste.	NA	
F-5f Management of Incompatible Wastes in Tank Systems	270.16(j); 264.199	66270.16(j); 66264.199	Demonstrate that incompatible waste and materials are not stored in same tank.	NA	
F-5g Management of Ignitable or Reactive Wastes Placed in Waste Piles	270.18(g); 264.256	66270.18(g); 66264.256	If waste is reactive or ignitable, describe how handling process will render waste pile nonreactive and/or nonignitable.	NA	
F-5h Management of Incompatible Wastes Placed in Waste Piles	270.18(h); 264.257	66270.18(h); 66264.257	Document how hazardous waste piles of incompatible materials are separated to render them nonreactive.	NA	
F-5i Management of Ignitable or Reactive Wastes in Surface Impoundments	270.17(h); 264.229	66270.17(h); 66264.229	If waste is reactive or ignitable, describe how handling process will render surface impoundments nonreactive and/or nonignitable.	NA	
F-5j Management of Incompatible Wastes in Surface Impoundments	270.17(h); 264.230	66270.17(h); 66264.230	Document how hazardous surface impoundments of incompatible materials are separated to render them nonreactive.	NA	
F-5k Management of Ignitable or Reactive Wastes Placed in Landfills	270.21(f); 264.312	66270.21(f); 66264.312	If waste is reactive or ignitable, describe how handling process will prevent reaction or ignition to landfills.	NA	
F-5l Management of Incompatible Wastes Placed in Landfills	270.21(g); 264.313	66270.21(g); 66264.313	Document how hazardous landfills of incompatible materials are separated to render them nonreactive.	NA	
F-5m Management of Ignitable or Reactive Wastes Placed in Land Treatment Units	270.20(g); 264.281	66270.20(g); 66264.281	If waste is reactive or ignitable, describe how handling process will render land treatment units nonreactive and/or nonignitable.	NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
F-5n Management of Incompatible Wastes Placed in Land Treatment Units	270.20(h); 264.282	66270.20(h); 66264.282	Document how land treatment unit piles of incompatible materials are separated to render them nonreactive.	NA	
F-5o Management of Incompatible Wastes Placed in Containment Buildings	270.14(a); 264.1101(a)(3)	66270.14(a); 66264.1101(a)(3)	Subsections include design, primary and secondary containment, barriers to prevent migration, leak detection, and facility logs.	NA	

Notes:

- ^a Considerations in addition to the requirements presented in the regulations.
- ^b For each requirement, this column must indicate one of the following: NA for not applicable, IM for information missing, or the exact location of the information in the application.
- ^c If application is deficient in an area, prepare a comment describing the deficiency, attach it to the checklist, and reference the comment in this column.

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PERMIT COMPLETENESS CHECKLIST

SECTION G. CONTINGENCY PLAN

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
G-1 Contingency Plan	270.14(b)(7)	66270.14(b)(7)		Section XIII	
G-2 Emergency Coordinators	270.14(b)(7); 264.52(d); 264.55	66270.14(b)(7); 66264.52(d); 66264.55	There must at least be one primary emergency coordinator available at all times.	Section XIII-3	
G-3 Implementation	270.14(b)(7); 264.52(a); 264.56(d)	66270.14(b)(7); 66264.52(a); 66264.56(d)	Emergency coordinator to determine that facility has had a release, fire, or explosion that could threaten human health or the environment outside facility.	Section XIII-3	
G-4 Emergency Actions	270.14(b)(7); 264.56	66270.14(b)(7); 66264.56		Section XIII	
G-4a Notification	270.14(b)(7); 264.56(a)	66270.14(b)(7); 66264.56(a)	Describe the method for immediate notification of facility personnel and necessary state and local agencies.	Section XIII-4	
G-4b Identification of Hazardous Materials	270.14(b)(7); 264.56(b)	66270.14(b)(7); 66264.56(b)	Observation, records or manifest, or chemical analysis may be used by emergency coordinator.	Section XIII-5	
G-4c Assessment	270.14(b)(7); 264.56(c),(d)	66270.14(b)(7); 66264.56(c),(d)	Direct and indirect effects must be considered.	Section XIII-6	
G-4d Control Procedures	270.14(b)(7); 264.52(a)	66270.14(b)(7); 66264.52(a)	Contingency plan must describe actions facility personnel must take in response to fires, explosions, or any unplanned release of hazardous waste to air, soil, or surface water.	Section XIII-7	
G-4e Prevention of Recurrence of Spread of Fires, Explosions, or Releases	270.14(b)(7); 264.56(e)	66270.14(b)(7); 66264.56(e)	Measures must include stopping processes and operations, collecting and containing release of waste, and removing or isolating containers.	Section XIII-7	

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SECTION G. CONTINGENCY PLAN

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
G-4e(1) Monitor for Leaks, Pressure Buildup, Gas Generation or Ruptures of Released Material	270.14(b)(7); 264.56(f)	66270.14(b)(7); 66264.56(f)	This item applies if facility stops operations.	Section XIII-7	
G-4f Storage, Treatment, and Disposal of Released Material	270.14(b)(7); 264.56(g)	66270.14(b)(7); 66264.56(g)	After emergency, emergency coordinator must provide for treating, storing, and disposing of recovered waste.	Section XIII-7	
G-4g Incompatible Waste	270.14(b)(7); 264.56(h)(1)	66270.14(b)(7); 66264.56(h)(1)	Until cleanup is complete, assure that incompatible waste is not stored together.	Section XIII-7	
G-4h Post-Emergency Equipment Management	270.14(b)(7); 264.56(h)(2)	66270.14(b)(7); 66264.56(h)(2)	Decontamination is required for emergency equipment.	Section XIII-7	
G-4h(1) Notification of Federal, State and Local Authorities before Resuming Operations	270.14(b)(7); 264.56(i)	66270.14(b)(7); 66264.56(i)	Federal or state authorities must be notified within 15 days of occurrence.	Section XIII-4	
G-4i Container Spills and Leakage	270.14(b)(7); 264.52; 264.71	66270.14(b)(7); 66264.52; 66264.71	Specify procedures to be used when responding to container spills and leakage.	Section XIII-7	
G-4j Tank Spills and Leakage			For a tank or containment system from which there has been a leak or spill:	NA	
G-4j(1) Stopping Waste Addition	270.14(b)(7); 264.196(a)	66270.14(b)(7); 66264.196	Document that the owner/operator will immediately stop the flow of hazardous waste.	NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
G-4j(2) Removing Waste	270.14(b)(7); 264.196(b)	66270.14(b)(7); 66264.196	Owner/operator will, within 24 hours after leak detected, remove waste and allow inspection and repair of the tank system to be performed.	NA	
G-4j(3) Containment of Visible Releases	270.14(b)(7); 264.196(c)	66270.14(b)(7); 66264.196	Specify that a visual inspection of a release will be conducted, demonstrate further mitigation of leak will be prevented, and visible contamination will be removed and disposed of properly.	NA	
G-4j(4) Notification Reports	270.14(b)(7); 264.196(d)	66270.14(b)(7); 66264.196	Demonstrate that any release to the environment will be reported to regional administrator within 24 hours of detection.	NA	
G-4j(5) Provisions of Secondary Containment, Repair, or Closure	270.14(b)(7); 264.196(e)	66270.14(b)(7); 66264.196	Provision of secondary containment repair, otherwise closure is required.	NA	
G4-k Surface Impoundment Spills and Leakage	270.14(b)(7); 264.227	66270.14(b)(7); 66264.227	Surface impoundments must be removed from service when:	NA	
G4-k(1) Emergency Repairs	270.14(b)(7); 264.227	66270.14(b)(7); 66264.227	Describe procedures for removing surface impoundments from service.	NA	
G4-k(1)(a) Stopping Waste Addition	270.14(b)(7); 264.227(b)(1)	66270.14(b)(7); 66264.227(b)(1)	Procedures for stopping waste addition to the impoundment.	NA	
G4-k(1)(b) Containing Leaks	270.14(b)(7); 264.227(b)(2)	66270.14(b)(7); 66264.227(b)(2)	Procedures for containing leak.	NA	
G4-k(1)(c) Stopping Leaks	270.14(b)(7); 264.227(b)(3)	66270.14(b)(7); 66264.227(b)(3)	Procedures for stopping leak.	NA	

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SECTION G. CONTINGENCY PLAN					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
G4-k(1)(d) Preventing Catastrophic Failure	270.14(b)(7); 264.227(b)(4)	66270.14(b)(7); 66264.227(b)(4)	Procedures to stop or prevent catastrophic failure.	NA	
G4-k(1)(e) Emptying the Impoundment	270.14(b)(7); 264.227(b)(5)	66270.14(b)(7); 66264.227(b)(5)	Procedures for emptying impoundment, if necessary.	NA	
G4-k(2) Certification	270.14(b)(7); 264.226(c); 264.227(d)(1)	66270.14(b)(7); 66264.226(c); 66264.227(d)(1)	Procedures for recertifying a dike's structural integrity if impoundment is removed from service due to actual or imminent failure.	NA	
G4-k(3) Repairs as a Result of Sudden Drop	270.14(b)(7); 264.227(d)(2)	66270.14(b)(7); 66264.227(d)(2)	Procedures to follow if impoundment is removed from service due to sudden drop in liquid level of the following:	NA	
G4-k(3)(a) Existing Portions of Surface Impoundment	270.14(b)(7); 264.227(d)(2)(i)	66270.14(b)(7); 66264.227(d)(2)(A)	Installation of liner for any existing portion of impoundment.	NA	
G4-k(3)(b) Other Portions of the Surface Impoundment	270.14(b)(7); 264.227(d)(2)(ii)	66270.14(b)(7); 66264.227(d)(2)(B)	Certification by qualified engineer for other than existing portions of the impoundment.	NA	
G4-l Containment Building Leaks	270.14(b)(7); 264.1101(c)(3)	66270.14(b)(7); 66264.1101(c)(3)	Through active life of building if owner/operator detects condition that could lead to release of hazardous waste.	NA	
G-4l(1) Repair of Containment Building	270.14(b)(7); 264.1101(c)(3)	66270.14(b)(7); 66264.1101(c)(3)	Within 7 days of detection, owner/operator must contact regional administrator. Enter record of discovery, remove contaminated portion of building from service, determine repair steps, and establish schedule for repair.	NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
G-4l(2) Certification Following Repair	270.14(b)(7); 264.1101(c)(3)(iii)	66270.14(b)(7); 66264.1101(c)(3)	Upon completion of repairs owner/operator must notify regional administrator.	NA	
G-4m Drip Pad Spills and Leakage	270.14(b)(7); 264.573(m)	66270.14(b)(7); 66264.573(m)	Throughout the active life of the drip pad, if a condition is detected that may have or has caused a release of hazardous waste, it must be repaired within a reasonably prompt period of time.	NA	
G-4m(1) Stopping Waste Addition	270.14(b)(7); 264.573(m)(1)(ii)	66270.14(b)(7); 66264.573(m)(1)(B)	Upon detection of leakage in the leak detection system, immediately remove the affected portion of the drip pad from service.	NA	
G-4m(2) Determine Appropriate Cleanup and Repair	270.14(b)(7); 264.573(m)(1)(iii)	66270.14(b)(7); 66264.573(m)(1)(C)	Establish a schedule for accomplishing the repairs.	NA	
G-4m(3) Notification	270.14(b)(7); 264.573(m)(1)(iv)	66270.14(b)(7); 66264.573(m)(1)(D)	Within 24 hours after discovery of the condition, notify the Regional Administrator or state director. Within 10 working days, provide written notice and a description of the repairs to be made to the drip pad.	NA	
G-4m(4) Certification	270.14(b)(7); 264.573(m)(3)	66270.14(b)(7); 66264.573(m)(3)	Upon completing all repairs and clean up, provide certification signed by an independent, qualified registered PE.	NA	
G-5 Emergency Equipment	270.14(b)(7); 264.52(e)	66270.14(b)(7); 66264.52(e)			

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SECTION G. CONTINGENCY PLAN					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
G-6 Arrangements with Local Authorities	270.14(b)(7); 264.37; 264.52(c)	66270.14(b)(7); 66264.37; 66264.52(c)	Police and fire departments, hospitals, and emergency response teams must be notified by owner/operator. Document refusal to enter into a coordination agreement.	Section XIII-9	
G-7 Evacuation Plan for Facility Personnel	270.14(b)(7); 264.52(f)	66270.14(b)(7); 66264.52(f)	Evacuation plans must include evacuation signals and primary and alternate evacuation routes.	Section XIII-10	
G-8 Required Report Procedures for Recordkeeping and Reporting to Federal Authority	270.14(b)(7); 264.56(j)	66270.14(b)(7); 66264.56(j)	Owner/operator must note on operation record the time, date and details of incidents which require implementation of contingency plan.	Section XIII-4	
G-9 Location and Distribution of Contingency Plan	270.14(b)(7); 264.53	66270.14(b)(7); 66264.53	Copy of contingency plan must be maintained at facility and submitted to local authorities.	Maintained on-site at the HWTSE office & on Refinery's intra-net. This Refinery has its own fire department.	

Notes:

- ^a Considerations in addition to the requirements presented in the regulations.
- ^b For each requirement, this column must indicate one of the following: NA for not applicable, IM for information missing, or the exact location of the information in the application.
- ^c If application is deficient in an area, prepare a comment describing the deficiency, attach it to the checklist, and reference the comment in this column.

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Reviewer: _____

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PERMIT COMPLETENESS CHECKLIST						
SECTION H. PERSONNEL TRAINING						
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c	
H-1	Outline of Introductory and Continuing Training Programs	270.14(b)(12); 264.16(a)(1)	66270.14(b)(12); 66264.16(a)(1)	Facility personnel must successfully complete classroom or on-the-job training which will allow them to responsibly perform in their positions.	Attachment XI-1	
H-1a	Job Title/Job Description	270.14(b)(12); 264.16(d)(1), (d)(2)	66270.14(b)(12); 66264.16(d)(1), (d)(2)	Owner or operator must maintain records of job titles, names of employees, job descriptions, and types and amounts of training given to employees.	Section XI-B	
H-1b	Description of How Training will be Designed to Meet Actual Job Tasks	270.14(b)(12); 264.16(c),(d) (3)	66270.14(b)(12); 66264.16(c),(d) (3)	Training must be conducted by a qualified person; there must also be an annual review of the training.	Section XI-B	
H-1c	Training Director	270.14(b)(12); 264.16(a)(2)	66270.14(b)(12); 66264.16(a)(2)	Program must be directed by person trained in hazardous waste procedures.	Section XI-A	
H-1d	Relevance of Training to Job Position	270.14(b)(12); 264.16(a)(2)	66270.14(b)(12); 66264.16(a)(2)	Training must include instruction on hazardous waste procedures relevant to each employee's position.	Section XI-C	
H-1e	Training for Emergency Response	270.14(b)(12); 264.16(a)(3)	66270.14(b)(12); 66264.16(a)(3)	Personnel must minimally be familiar with emergency procedures, emergency equipment, and emergency systems.	Section XI-B	

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SECTION H. PERSONNEL TRAINING					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
H-2 Maintenance of Training Records/Copy of Personnel Training Documents	270.14(b)(12); 264.16(b),(d) (4),(e)	66270.14(b)(12); 66264.16(b),(d) (4),(e)	Training records on current personnel must be kept until closure of facility. Training must be completed within 6 months after date of employment.	Section XI-D	

Notes:

- ^a Considerations in addition to the requirements presented in the regulations.
- ^b For each requirement, this column must indicate one of the following: NA for not applicable, IM for information missing, or the exact location of the information in the application.
- ^c If application is deficient in an area, prepare a comment describing the deficiency, attach it to the checklist, and reference the comment in this column.

SECTH.WPD

Reviewer: _____
Checklist Revision Date (March 1999)

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SECTION I. CLOSURE POST-CLOSURE FINANCIAL REQUIREMENTS

Section and Requirement	Federal Regulation	State Regulation	Review Consideration^a	Location in Application^b	See Attached Comment Number^c
I-1 Closure Plans	270.14(b)(13)	66270.14(b)(13)		Section XVII	
I-1a Closure Performance Standard	270.14(b)(13); 264.111	66270.14(b)(13); 66264.111	Describe how closure: minimizes the need for further maintenance; controls, minimizes, or eliminates the post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere; and complies with the closure requirements of Chapter 14, Article 7 and unit-specific closure requirements.	Section XVII	
I-1b Time and Activities Required for Partial Closure and Final Closure Activities	270.14(b)(13); 264.112(b)(1) through 264.112(b)(7)	66270.14(b)(13); 66264.112(b)(1) through 66264.112(b)(7)	Describe the time and all activities required for: partial closure, if applicable; final closure; and maximum extent of operation that will be active during life of facility.	Section XVII-B, Section XVII-C	
I-1c Maximum Waste Inventory	270.14(b)(13); 264.112(b)(3)	66270.14(b)(13); 66264.112(b)(3)		Section XVII-A, Table VIII-2	
I-1d Schedule for Closure	270.14(b)(13); 264.112(b)(6)	66270.14(b)(13); 66264.112(b)(6)		Section XVII-B	
I-1(d)(1) Time Allowed for Closure	270.14(b)(13); 264.112(b)(2); 264.113(a) and (b)	66270.14(b)(13); 66264.112(b)(2); 66264.113(a) and (b)		Section XVII-B	
I-1d(1)(a) Extension for Closure Time	270.14(b)(13); 264.113(a) and (b)	66270.14(b)(13); 66264.113(a) and (b)		Section XVII-B	

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SECTION I. CLOSURE POST-CLOSURE FINANCIAL REQUIREMENTS					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
I-1e Closure Procedures	270.14(b)(13); 264.112; 264.114	66270.14(b)(13); 66264.112; 66264.114		Section XVII-C	
I-1e(1) Inventory Removal	270.14(b)(13); 264.112(b)(3)	66270.14(b)(13); 66264.112(b)(3)	Discuss methods for removing, transporting, treating, storing, or disposing of all hazardous wastes and identify the type(s) of off-site hazardous waste management units to be used.	Section XVII-C	
I-1e(2) Disposal or Decontamination of Equipment, Structure, and Soils	270.14(b)(13); 264.112(b)(4); 264.114	66270.14(b)(13); 66264.112(b)(4); 66264.114	Provide a detailed description of the steps needed to decontaminate or dispose of all facility equipment and structures.	Section XVII-C	
I-1e(3) Closure of Disposal Units/Contingent Closures	270.14(b)(13)	66270.14(b)(13)		NA	
I-1e(3)(a) Disposal Impoundments	270.14(b)(13); 264.228(a)(2)	66270.14(b)(13); 66264.228(a)(2)		NA	
I-1e(3)(a)(i) Elimination of Liquids	270.14(b)(13)	66270.14(b)(13); 66264.228(a)(2)(A)		NA	
I-1e(3)(a)(ii) Waste Stabilization	270.14(b)(13); 264.228(a)(2) (ii)	66270.14(b)(13); 66264.228(a)(2) (B)		NA	
I-1e(3)(b) Cover Design	270.14(b)(13); 264.228(a)(2) (iii);264.310 (a)	66270.14(b)(13); 66264.228(a)(2) (C); 66264.310 (a)		NA	

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SECTION I. CLOSURE POST-CLOSURE FINANCIAL REQUIREMENTS

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
I-1e(3)(c) Minimization of Liquid Migration	270.14(b)(13); 264.228(a)(2) (iii)(A); 264.310(a)(1)	66270.14(b)(13); 66264.228(a)(2) (C)1; 66264.310(a)(1)	Draft RCRA Guidance Document entitled <u>Landfill (Design--Liner Systems and Final Cover</u> (1982), suggests the following design for landfill cover systems (from top to bottom): a vegetated top cover, with a minimum of 24 inches of topsoil; a middle drainage layer (at least one foot thick with a saturated conductivity of not less than 1×10^{-3} cm/sec) overlain by a geotextile filter fabric or graded granular filter; and a low permeability bottom layer consisting of two components: an upper component of at least a 20 mil synthetic membrane protected above and below by at least six inches of bedding material, a lower component of at least 24 inches of low permeability (maximum hydraulic conductivity of 1×10^{-7} cm/sec) soil emplaced in lifts not exceeding six inches. For cover designs different than EPA-recommended designs, provide engineering calculations showing the proposed cover will provide long-term minimization of liquid migration through the cover.	NA	
I-1e(3)(d) Maintenance Needs	270.14(b)(13); 264.228(a)(2) (iii)(B); 264.310(a)(2)	66270.14(b)(13); 66264.228(a)(2) (C)2; 66264.310(a)(2)		NA	

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SECTION I. CLOSURE POST-CLOSURE FINANCIAL REQUIREMENTS

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
I-1e(3)(e) Drainage and Erosion	270.14(b)(13); 264.228(a)(2)(iii)(C); 264.310(a)(3)	66270.14(b)(13); 66264.228(a)(2)(C)3; 66264.310(a)(3)	The following information should be provided: data demonstrating that the proposed final slopes will not cause significant cover erosion; description of drainage materials and their permeabilities; engineering calculations demonstrating free drainage of precipitation off of and out of the cover; and estimation of the potential for drainage-layer clogging.	NA	
I-1e(3)(f) Settlement and Subsidence	270.14(b)(13); 264.228(a)(2)(iii)(D); 264.310(a)(4)	66270.14(b)(13); 66264.228(a)(2)(C)4; 66264.310(a)(4)	Include the following information: potential foundation compression; potential soil liner compression; and potential waste consolidation and compression resulting from waste dewatering, biological oxidation and chemical conversion of solids to liquids.	NA	
I-1e(3)(g) Cover Permeability	270.14(b)(13); 264.228(a)(2)(iii)(E); 264.310(a)(5)	66270.14(b)(13); 66264.228(a)(2)(C)5; 66264.310(a)(6)		NA	
I-1e(3)(h) Freeze/Thaw Effects	270.14(b)(13); 264.228(a)(2)(iii); 264.310(a)	66270.14(b)(13); 66264.310(a)	Identify the average depth of frost penetration and describe the effects of freeze/thaw cycles on the cover.	NA	
I-1e(4) Closure of Containers	270.14(b)(13); 264.178; 264.112(b)(3); 270.14(b)(13)	66270.14(b)(13); 66264.178; 66264.112(b)(3)	Address the following: hazardous waste removal and disposal; container decontamination and disposal; site decontamination and disposal including linings, soil, and washes; maximum inventory.	Section XVII-C	

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SECTION I. CLOSURE POST-CLOSURE FINANCIAL REQUIREMENTS

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
I-1e(5) Closure of Tanks	270.14(b)(13); 264.197; 264.112(b)(3)	66270.14(b)(13); 66264.197	The description should address the following: waste removal from tanks and equipment; decontamination of all components; verification of decontamination; disposal of wastes and residues; and maximum inventory.	NA	
I-1e(6) Closure of Waste Piles	270.14(b)(13); 270.18(h); 264.258	66270.14(b)(13); 66270.18(h); 66264.258	The description must address the following: procedure and criteria for determining whether or not decontamination has been successful; and sampling and analytical techniques.	NA	
I-1e(7) Closure of Surface Impoundments	270.14(b)(13); 270.17(f); 264.228(a)(1), (2), and (b)	66270.14(b)(13); 66270.17(f); 66264.228(a)(1), (2), and (b)	Surface impoundments without liners or with liners that do not meet the requirements must also provide contingent plans for closure in place and a contingent post-closure plan, except for impoundments requesting a liner exemption in accordance with D-4b.	NA	
I-1e(8) Closure of Incinerators	270.14(b)(13); 264.351	66270.14(b)(13); 66264.351	Describe how, at closure, all hazardous waste and hazardous waste residues (including, but not limited to, ash, scrubber waters, and scrubber sludges) will be removed from the incinerator, associated ductwork, piping, air pollution control equipment, sumps, and any other structures or operating equipment such as pumps, valves, etc., that have come into contact with the hazardous waste. Alternatively, describe how the incinerator and associated units and equipment will be dismantled and disposed of as a hazardous waste.	NA	
I-1e(9) Closure of Landfills	270.14(b)(13); 270.21(e); 264.310(a)	66270.14(b)(13); 66270.21(e); 66264.310(a)	Provide detailed plans and engineering report that describes the final cover components in detail. Cover installation and construction quality assurance procedures should be thoroughly described.	NA	

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SECTION I. CLOSURE POST-CLOSURE FINANCIAL REQUIREMENTS

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
I-1e(10) Closure of Land Treatment Facilities	270.14(b)(13); 264.280(a); 270.20(f)	66270.14(b)(13); 66264.280(a); 66270.20(f)		NA	
I-1e(10)(a) Continuance of Treatment	270.14(b)(13); 264.280(a)(1) through (7)	66270.14(b)(13); 66264.280(a)(1) through (7)		NA	
I-1e(10)(b) Vegetative Cover	270.14(b)(13); 270.20(f); 264.280(a)(8)	66270.14(b)(13); 66270.20(f); 66264.280(a)(8)		NA	
I-1e(11) Closure of Miscellaneous Units	270.14(b)(13); 270.23(a)(2)	66270.14(b)(13); 66270.23(a)(2); 66264.601		NA	
I-1e(12) Closure of Boilers and Industrial Furnaces	270.14(b)(13); 266.102(a)(2) (vii)	66270.14(b)(13); 66266.102(a)(2) (G)	Describe how, at closure, all hazardous waste and hazardous waste residues (including, but not limited to, ash, scrubber waters, and scrubber sludges) will be removed from the BIF unit, associated ductwork, piping, air pollution control equipment, sumps and any other structures or operating equipment such as pumps, valves, etc., that have come into contact with hazardous wastes. Alternatively, describe how the BIF and associated equipment will be dismantled and disposed of. If any wastes, waste residues, contaminated components, subsoils, structures or equipment remain after closure, provide plans for closing the BIF unit as a landfill and provide a post-closure care plan.	NA	

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SECTION I. CLOSURE POST-CLOSURE FINANCIAL REQUIREMENTS

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
I-1e(13) Closure of Containment Buildings	270.14(b)(13); 264.1102	66270.14(b)(13); 66264.1102	Show that at closure all hazardous waste, hazardous waste residues, contaminated containment system, contaminated subsoils, and all structures and equipment contaminated with waste and leachate will be removed. If any wastes, waste residues, contaminated components, subsoils, structures or equipment remain after closure, provide plans for closing the containment building as a landfill and provide a post-closure care plan.	NA	
I-2 Post-Closure Plans	270.14(b)(13)	66270.14(b)(13)		Section XVII-H	
I-2a Inspection Plan	270.14(b)(13); 264.118(a); 264.197(b); 264.197(c)(2); 264.226(d)(2); 264.228(b); 264.228(c)(1)(ii); 264.258(b); 264.258(c)(1)(ii); 264.303(c); 264.310(b)	66270.14(b)(13); 66264.118(a); 66264.197(b); 66264.197(c)(2); 66264.226(d)(2); 66264.228(b); 66264.228(c)(1)(B); 66264.258(b); 66264.258(c)(1)(B); 66264.303(c); 66264.310(b)	Rationale for determining the length of time between inspections should be provided.	NA	

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SECTION I. CLOSURE POST-CLOSURE FINANCIAL REQUIREMENTS					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
I-2b Monitoring Plan	270.14(b)(13); 264.118(b)(1); 264.197(b); 264.197(c)(2); 264.226(d)(2); 264.228(b); 264.228(c)(1)(ii); 264.258(b); 264.258(c)(1)(ii); 264.303(c); 264.310(b)	66270.14(b)(13); 66264.118(b)(1); 66264.197(b); 66264.197(c)(2); 66264.226(d)(2); 66264.228(b); 66264.228(c)(1)(B); 66264.258(b); 66264.258(c)(1)(B); 66264.303(c); 66264.310(b)		NA	
I-2c Maintenance Plan	270.14(b)(13); 264.118(b)(2); 264.197(b); 264.197(c)(2); 264.228(b); 264.228(c)(1)(ii); 264.258(b); 264.258(c)(1)(ii); 264.310(b)	66270.14(b)(13); 66264.118(b)(2); 66264.197(b); 66264.197(c)(2); 66264.228(b); 66264.228(c)(1)(B); 66264.258(b); 66264.258(c)(1)(B); 66264.310(b)	Describe the preventative and corrective maintenance procedures, equipment procedures, equipment requirements and material needs.	NA	
I-2d Land Treatment	270.14(b)(13); 264.280(c)	66270.14(b)(13); 66264.280(c)	Describe the operation, inspection, and maintenance programs to be used at the closed facility.	NA	
I-2e Post-Closure Care for Miscellaneous Units	270.14(b)(13); 270.23(a)(3); 264.603	66270.14(b)(13); 66270.23(a)(3); 66264.603		NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
I-2f Post-Closure Security	270.14(b)(13); 264.117(b) and (c)	66270.14(b)(13); 66264.117(b) and (c)	Demonstrate that for property where hazardous wastes remain after partial or final closure, post-closure use must never be allowed to disturb the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the facility's monitoring system.	NA	
I-2g Post-Closure Contact	270.14(b)(13); 264.118(b)(3)	66270.14(b)(13); 66264.118(b)(3)		NA	
I-3 Notices Required for Disposal Facilities	270.14(b)(13)	66270.14(b)(13)		NA	
I-3a Certification of Closure	270.14(b)(13); 264.115; 264.280	66270.14(b)(13); 66264.115; 66264.280(b)		Section XVII-G	
I-3b Survey Plat	270.14(b)(13); 264.116	66270.14(b)(13); 66264.116		NA	
I-3c Post-Closure Certification	270.14(b)(13); 264.120	66270.14(b)(13); 66264.120		NA	
I-3d Post-Closure Notices	270.14(b)(13); 270.14(b)(14); 264.119	66270.14(b)(13); 66270.14(b)(14); 66264.119		NA	

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SECTION I. CLOSURE POST-CLOSURE FINANCIAL REQUIREMENTS

Section and Requirement	Federal Regulation	State Regulation	Review Consideration^a	Location in Application^b	See Attached Comment Number^c
I-4 Closure Cost Estimate	270.14(b)(15); 264.142	66270.14(b)(15); 66264.142	Estimate must equal final cost estimate. Estimate must be based on third party closing facility and may use on-site disposal if capacity will exist over life of facility. Estimate must be adjusted for annual inflation as stated in 66264.142(b). Estimates may not assume zero cost for hazardous waste handling, and may not incorporate salvage value, facility structures/equipment, land, or other facility assets as offsets.	Section XVII-H, Figure XVII-2, Attachment XVII-1	
I-5 Financial Assurance for Closure	270.14(b)(15); 264.143; 264.151	66270.14(b)(15); 66264.143		Section XVIII	
I-5a Closure Trust Fund	270.14(b)(15); 264.143(a); 264.151(a)(1)	66270.14(b)(15); 66264.143(a)	Provide copy of fund agreement.	NA	
I-5b Surety Bond	270.14(b)(15); 264.143(b), (c); 264.151 (b),(c)	66270.14(b)(15); 66264.143(b), (c)		NA	
I-5b(1) Surety Bond Guaranteeing Payment into a Closure Trust Fund	270.14(b)(15); 264.143(b); 264.151(b)	66270.14(b)(15); 66264.143(b)	Must provide bond or standby trust agreement. Bond must guarantee owner/operator will fund standby trust fund or provide financial assurance equal to penal sum.	NA	
I-5b(2) Surety Bond Guaranteeing Performance of Closure	270.14(b)(15); 264.143(c); 264.151(c)	66270.14(b)(15); 66264.143(c)		NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
I-5(c) Closure Letter of Credit	270.14(b)(15); 264.143(d); 264.151(d)	66270.14(b)(15); 66264.143(d)	Requires letter of credit for 1 year equal to amount of closure.	NA	
I-5(d) Closure Insurance	270.14(b)(15); 264.143(e); 264.151(e)	66270.14(b)(15); 66264.143(e)		NA	
I-5(e) Financial Test and Corporate Guarantee for Closure	270.14(b)(15); 264.143(f); 264.151(f),(h)	66270.14(b)(15); 66264.143(f)	Signed letter by owner/operator or chief financial officer as specified in 66264.151(f),(h) of applicant financial statement. If a parent corporation is guaranteeing closure care, corporate guarantee must accompany.	Section XVIII	
I-5(f) Alternative Financial Mechanism	270.14(b)(15); 264.143(g)	66270.14(b)(15); 66264.143(g)	Financial assurance instruments must meet requirements stated in 66264.143 (a),(b),(c),(d) or (e) that include trust funds, surety bonds, letter of credit, and insurance, respectively.	NA	
I-5(g) Use of Multiple Financial Mechanism for Multiple Facilities	270.14(b)(15); 264.143(h)	66270.14(b)(15); 66264.143(h), (i)	Provide financial assurance mechanism showing amount of funds assured.	NA	
I-6 Post-Closure Cost Estimate	270.14(b)(16); 264.144	66270.14(b)(16); 66264.144	Estimate must be based on third party closing facility and may use on-site disposal if capacity will exist over life of facility. Estimate must be adjusted for annual inflation as stated in 66264.142(b).	NA	
I-7 Financial Assurance Mechanism for Post Closure Care	270.14(b)(16); 264.145; 264.151	66270.14(b)(16); 66264.145		NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
I-7a Post-Closure Trust Fund	270.14(b)(16); 264.145(a); 264.151(a)(1)	66270.14(b)(16); 66264.145(a)		NA	
I-7b Surety Bond	270.14(b)(16); 264.145(b),(c); 264.151(b),(c)	66270.14(b)(16); 66264.145(b),(c)	66264.145(b),(c) spells out requests for owner/operator for adjusting estimates, inflation, and reporting to regional administrator.	NA	
I-7b(1) Surety Bond Guaranteeing Payment into a Post-Closure Trust Fund	270.14(b)(16); 264.145(b); 264.151(b)	66270.14(b)(16); 66264.145(b)	Must provide bond or standby trust agreement before beginning final closure of the facility. Bond must guarantee owner/operator will fund a standby trust fund or provide financial assurance equal to penal sum.	NA	
I-7b(2) Surety Bond Guaranteeing Performance of Closure	270.14(b)(16); 264.145(c); 264.151(c)	66270.14(b)(16); 66264.145(c)		NA	
I-7(c) Post-Closure Letter of Credit	270.14(b)(16); 264.145(d); 264.151(d)	66270.14(b)(16); 66264.145(d)	Requires letter of credit for 1 year equal to amount of post-closure cost.	NA	
I-7(d) Post-Closure Insurance	270.14(b)(16); 264.145(e); 264.151(e)	66270.14(b)(16); 66264.145(e); 66264.151(e)		NA	
I-7(e) Financial Test and Corporate Guarantee for Post-Closure Care	270.14(b)(16); 264.145(f); 264.151(f),(h)	66270.14(b)(16); 66264.145(f)		NA	
I-7(f) Alternative Financial Mechanism for Postclosure Care	270.14(b)(16); 264.145(g)	66270.14(b)(16); 66264.145(g)	Provide copy of financial assurance mechanisms. Combined financial assurance must be at least equal to post-closure cost estimate.	NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration^a	Location in Application^b	See Attached Comment Number^c
I-7(g) Use of Multiple Financial Mechanism per facility	270.14(b)(16); 264.145(h)	66270.14(b)(16); 66264.145(h)	Provide copy of financial assurance mechanisms for more than one facility. Amount must be no less than sum of funds that would be available if separate mechanism had been established and maintained for each facility. NOTE: Use subsection 66264.145(i) for a financial mechanism for multiple facilities for postclosure care.	NA	
I-8 Liability Requirements	270.14(b)(17); 264.147	66270.14(b)(17); 66264.147		NA	
I-8a Coverage for Sudden Accidental Occurrences	270.14(b)(17); 264.147(a)	66270.14(b)(17); 66264.147(a)	Coverage must be maintained for sudden accidental occurrences in the amount of \$1 million per occurrence with an annual agreement of at least \$2 million.	NA	
I-8a(1) Endorsement of Certification	270.14(b)(17); 264.147(a)(1)	66270.14(b)(17); 66264.147(a)(1)		NA	
I-8a(2) Financial Test and Corporate Guarantee for Liability Coverage	270.14(b)(17); 264.147(a)(2), (f),(g); 264.151(f),(g)	66270.14(b)(17); 66264.147(a)(2), (f),(g);		NA	
I-8a(3) Use of Multiple Financial Mechanism	270.14(b)(17); 264.147(a)(3)	66270.14(b)(17); 66264.147(a)(3)	Submit items demonstrating liability coverage specified in I-8a(1) and I-8a(2). Amount of coverage must total at least minimum amount required by 66264.147(a).	NA	

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SECTION I. CLOSURE POST-CLOSURE FINANCIAL REQUIREMENTS						
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c	
I-8b	Coverage for Nonsudden Accidental Occurrences	270.14(b)(17); 264.147(b)	66270.14(b)(17); 66264.147(b)	For high risk storage facilities, surface impoundments, land disposal, land treatment facilities, liability coverage must be maintained in the amount of at least \$3 million per occurrence. Annual aggregate at least \$6 million.	NA	
I-8b(1)	Endorsement or Certification	270.14(b)(17); 264.147(b)(1)	66270.14(b)(17); 66264.147(b)(1)	Submit signed duplicate original of Hazardous Waste Facility Liability Endorsement.	NA	
I-8b(2)	Financial Test or Corporate Guarantee for Liability Coverage	270.14(b)(17); 264.147(b)(2); 264.151(f),(g)	66270.14(b)(17); 66264.147(b)(2);		NA	
I-8b(3)	Use of Multiple Insurance Mechanism	270.14(b)(17); 264.147(b)(3)	66270.14(b)(17); 66264.147(b)(3)	Submit items demonstrating liability coverage specified in I-8a(1) and I-8a(2). Amount of coverage must total at least minimum amount required by 66264.147(b).	NA	
I-8c	Requests for Variance	270.14(b)(17); 264.147(c)	66270.14(b)(17); 66264.147(c)	Request for adjusted level of required liability must be supported by information which demonstrates 66264.147(a) or (b) are not consistent with degree and duration of risk associated with treatment, storage, or disposal at facility or group of facilities.	NA	
I-9	Use of State Required Mechanisms	270.14(b)(18)	66270.14(b)(18)		NA	
I-9a	Use of State Required Mechanisms	270.14(b)(18); 264.149	66270.14(b)(18); 66264.149	When state has regulations equivalent or greater liability requirements for financial assurance for closure post-closure submit copy of state-required financial mechanism.	NA	

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SECTION I. CLOSURE POST-CLOSURE FINANCIAL REQUIREMENTS

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
I-9b State Assumption of Responsibility	270.14(b)(18); 264.150	66270.14(b)(18);	If state assumes legal responsibility for compliance with closure, post-closure, or liability requirements there must be a letter submitted from state specifying assumption of responsibilities and amounts of liability. coverage assured by state.	NA	

Notes:

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^c If application is deficient in an area, prepare a comment describing the deficiency, attach it to the checklist, and reference the comment in this column.

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PERMIT COMPLETENESS CHECKLIST						
SECTION J. SOLID WASTE MANAGEMENT UNITS						
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c	
J-1	Characterize the Solid Waste Management Unit (SWMU)	270.14(d)(1)	66270.14(d)(1)	Describe methodology used to determine that no existing or former SWMUs exist at facility if applicable.	NA	
J-2	Releases	270.14(d)(2)	66270.14(d)(2)	Provide following information concerning releases: date of release; type, quantity, and nature of release; groundwater monitoring and other analytical data; physical evidence of stressed vegetation; historical evidence of releases; any state, local, or federal enforcement action that may address releases; any public citizen complaints that indicate a release; and any other information showing the migration of the release. Describe methodology used to determine that releases from SWMUs are not present.	NA	

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SECTION K. OTHER FEDERAL LAWS

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See attached Comment Number ^c
K-1 Other Federal Laws	270.14(b)(20), 270.3	66270.14(b)(19), 66270.3	Demonstrate compliance with requirements of applicable Federal laws such as the Wild and Scenic Rivers Act, National Historic Preservation Act of 1966, Endangered Species Act, Coastal Zone Management Act, and Fish and Wildlife Coordination Act.	NA	

Notes:

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SECTION L. PART B CERTIFICATION					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
L-1 Part B Certification	270.11	66270.11		Part A Application	

Notes:

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PERMIT COMPLETENESS CHECKLIST					
SECTION M. ARTICLE 27, AIR EMISSION STANDARDS FOR PROCESS VENTS (SUBPART AA)					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
M-1 Definition of Process Vent	270.14(a); 264.1030; 264.1031	66260.10; 66270.14(a); 66264.1030	A process vent is any open-ended pipe or stack that is vented to atmosphere either directly, through a vacuum-producing system, or through a tank.	NA	
M-2 Applicability—Process Vents Associated with the Following Six Operations that Manage Hazardous Waste with Organic Concentrations of at Least 10 Parts per Million by Weight if these Operations are Conducted in; a Unit Subject to the Permitting Requirements of 270; a Unit (including a Hazardous Waste Recycling Unit) that is Not Exempt from Permitting Under 262.34(a) and is Located at a Hazardous Waste Management Facility Otherwise Subject to Permitting Requirements; and a Unit that is Exempt from Permitting Under 262.34(a)	270.14(a); 264.1030(b); 264.1031	66260.10; 66270.14(a); 66264.1030(b)	Concentrations should be determined by a time-weighted average annually or when waste or process changes.	NA	
M-2a Distillation—a Batch or Continuous Operation Which Separates One or More Feed Stream(s) into Two or More Exit Streams, Each Exit Stream Having Component Concentrations Different from Those in the Feed Stream(s)	270.24(b)(3); 264.1030(b); 264.1031	66260.10; 66270.24(b)(3); 66264.1030(b)	Include process description.	NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration^a	Location in Application^b	See Attached Comment Number^c
M-2b Fractionation—a Distillation Operation or Method Used to Separate a Mixture of Several Volatile Components of Different Boiling Points in Successive Stages	270.24(b)(3); 264.1030(b); 264.1031	66260.10; 66270.24(b)(3); 66264.1030(b)	Include process description.	NA	
M-2c Thin-Film Evaporation—a Distillation Operation that Employs a Heating Surface Consisting of a Large Diameter Tube that May be Either Straight or Tapered, Horizontal or Vertical	270.24(b)(3); 264.1030(b); 264.1031	66260.10; 66270.24(b)(3); 66264.1030(b)	Include process description.	NA	
M-2d Solvent Extraction—an Operation or Method of Separation in Which a Solid or Solution Contacts a Liquid Solvent (The Two Being Mutually Insoluble) to Preferentially Dissolve and Transfer One or More Components into the Solvent	270.24(b)(3); 264.1030(b); 264.1031	66260.10; 66270.24(b)(3); 66264.1030(b)	Include process description.	NA	
M-2e Air Stripping—a Desorption Operation Employed to Transfer One or More Volatile Components from a Liquid Mixture into a Gas (Air) Either with or Without the Application of Heat to the Liquid	270.24(b)(3); 264.1030(b); 264.1031	66260.10; 66270.24(b)(3); 66264.1030(b)	Include process description.	NA	

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SECTION M. ARTICLE 27, AIR EMISSION STANDARDS FOR PROCESS VENTS (SUBPART AA)					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
M-2f Stream Stripping—a Distillation Operation in Which Vaporization of the Volatile Constituents of a Liquid Mixture Takes Place by the Introduction of Steam Directly into the Charge.	270.24(b)(3); 264.1030(b); 264.1031	66260.10; 66270.24(b)(3); 66264.1030(b)	Include process description.	NA	
M-3a Reduce Total Organic Emission below 1.4 Kilogram per Hour (3 Pounds per Hour) and 2.8 Million Grams per Year (3.1 Tons per Year), <u>or</u>	270.24(b); 264.1032(a) (1),(c)	66270.24(b); 66264.1032(a) (1),(c)	Engineering calculations or performance tests may be used to determine vent emissions and emissions reductions or total organic compound concentrations achieved by add-on control devices.	NA	
M-3b Reduce Total Organic Emissions of 95 Percent by Weight with the Use of a Control Device	270.24(b); 264.1032(a) (2),(b)	66270.24(b); 66264.1032(a) (2),(b)	Engineering calculations or performance tests may be used to determine vent emissions and emissions reductions or total organic compound concentrations achieved by add-on control devices.	NA	
M-3c Reduce Emissions for Various Control Devices with Closed-vent Systems under the Following Operational Conditions:	270.24(b); 264.1032(a) - b); 264.1033 (b - j)	66270.24(b); 66264.1032(a - b); 66264.1033 (b - j)	Closed-vent systems are optional devices, but shall comply with regulations if they are used.	NA	
M-3c(1) Control Device Involving Vapor Recovery (Condenser or Adsorber) Shall Recover at Least 95 Percent by Weight of the Organic Vapors	270.24(b); 264.1032(a) (1),(b)	66270.24(b); 66264.1032(a) (1),(b)	A less than 95 percent recovery is permissible if control devices meet emission limits set in 66264.1032(a)(1).	NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
M-3c(2) Enclosed Combustion Device (A Vapor Incinerator, Boiler, or Process Heater) Shall Recover at Least 95 Percent by Weight of Organic Emissions	270.24(d); 264.1033(c)	66270.24(d); 66264.1033(c)	The device shall achieve 20 parts per million by weight or 1/2 second residence time at 760 <input type="checkbox"/>	NA	
M-3c(3) A Flare Shall Operate under the Following Four Conditions: (1) No Visible Emissions, (2) a Flame Present at all Times, (3) an Acceptable Net Heating Value, and (4) Appropriate Exit Velocity	270.24(d); 264.1033(d)	66270.24(d); 66264.1033(d)		NA	
M-4 Inspection Readings Shall Be Conducted at Least Daily. Vent Stream Flow Information Shall be Provided at Least Hourly.	270.24(d); 264.1033(f)(1),(3)	66270.24(d); 66264.1033(f)(1),(3)		NA	
M-4a Continuous Monitoring for the Following Control Devices:	270.24(d); 264.1033(f)(2)	66270.24(d); 66264.1033(f)(2)		NA	
M-4a(1) Thermal Vapor Incinerator (One Temperature Sensor).	270.24(d); 264.1033(f)(2)(i)	66270.24(d); 66264.1033(f)(2)(A)	Sensor shall have accuracy of ± 1 percent <input type="checkbox"/> C or \pm whichever is greater.	NA	
M-4a(2) Catalytic Vapor Incinerator (Two Temperature Sensor)	270.24(d); 264.1033(f)(2)(i)	6270.24(d); 66264.1033(f)(2)(A)	Sensor shall have accuracy of ± 1 percent <input type="checkbox"/> C or \pm whichever is greater.	NA	
M-4a(3) Flare (Heat Sensing Device)	264.1033(f)(2)(iii)	66264.1033(f)(2)(C)		NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
M-4a(4) Boiler or Process Heater with Heater Input Capacity Equal or Greater than 44 Megawatts (Recorder Which Indicates Good Combustion Practices)	270.24(d); 264.1033(f)(2)(v)	66270.24(d); 66264.1033(f)(2)(E)		NA	
M-4a(5) Condenser (Device with Recorder to Measure the Concentration of Organic Compounds in the Condenser Exhaust Vent Stream or Temperature Monitoring Device Equipped with Recorder to Measure Temperature in the Condenser Exhaust Vent Stream)	270.24(d); 264.1033(f)(2)(vi)	66270.24(d); 66264.1033(f)(2)(F)	Sensor shall have accuracy of ± 1 percent <input type="checkbox"/> C or \pm whichever is greater.	NA	
M-4a(6) Carbon Adsorption System (Device to Measure Organic Vapors or a Recorder that Verifies Predetermined Regeneration Cycle)	270.24(d); 264.1033(f)(2)(vii)	66270.24(d); 66264.1033(f)(2)(G)		NA	
M-4b Alternate Monitoring of Control Device	270.24(c); 264.1033(i)	66270.24(c); 66264.1033(i)	Describe measurement of applicable monitoring parameters.	NA	
M-4c Inspection of the Following Control Devices:	270.24(d); 264.1033(g - h)	66270.24(d); 66264.1033(g - h)		NA	
M-4c(1) Regenerable Carbon Adsorption System	270.24(d); 264.1033(g)	66270.24(d); 66264.1033(g)	Carbon replacement schedule must be acceptable.	NA	

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SECTION M. ARTICLE 27, AIR EMISSION STANDARDS FOR PROCESS VENTS (SUBPART AA)					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
M-4c(2) Nonregenerable Carbon Adsorption System	270.24(d); 264.1033(h)	66270.24(d); 66264.1033(h)	Carbon shall be replaced when breakthrough is observed or on an acceptable schedule.	NA	
M-5 Basic Design and Operation				NA	
M-5a The Closed-Vent System Shall be Designed to Operate According to Either of the Following:	270.24(d); 264.1033(k)	66270.24(d); 66264.1033(k)		NA	
M-5a(1) With No Detectable Emissions	270.24(d); 264.1033(k)(1)	66270.24(d); 66264.1033(k)(1)	Emissions shall be less than 500 parts per million above background.	NA	
M-5a(2) At a Pressure below Atmospheric Pressure	270.24(d); 264.1033(k)(2)	66270.24(d); 66264.1033(k)(2)	System shall be equipped with at least one pressure gauge or other measurement device that can be read from a readily accessible location to verify negative pressure is being maintained in system during operation.	NA	
M-5b Owner/operator Shall Monitor and Inspect Each System	270.24(d); 264.1033(1)	66270.24(d); 66264.1033(1)		NA	
M-5c Closed-Vent System Shall be Operated at all Times When Emissions May be Vented to Them.	270.24(d); 264.1033(m)	66270.24(d); 66264.1033(m)		NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
M-5d Carbon Adsorption System Used to Control Air Pollutant Emissions	270.24(d); 264.1033(n)	66270.24(d); 66264.1033(n)	Owner/operator must document that all carbon that is a hazardous waste and removed from the control device is managed in one of these approved manners: 66264.1033(n)(1), (2), or (3).	NA	
M-6 Any Components of a Closed-Vent System that are Designated as Unsafe to Monitor are Exempt from the Monitoring Requirements of 66264.1033(l)(1)(A)2. if Certain Conditions are Met.	270.24(d); 264.1033(o)	66270.24(d); 66264.1033(o)	66270.24 applies to system if its components are unsafe to monitor and it adheres to written plan that requires monitoring using the procedures in 66264.1033(l)(1)(B)2. as frequently as practicable during safe-to-monitor times.	NA	
M-7a Owner/operator Complies with Record Keeping Requirements	270.24(d); 264.1033; 264.1035	66270.24(d); 66264.1033; 66264.1035	Depending on the type of control devices and closed vent systems used, various records must be maintained in the facility operating record.	NA	
M-7b Semiannual Report is Submitted According to Subpart AA Requirements	270.14(a); 264.1036	66270.14(a); 66264.1036	A semiannual report is only required if a control device operates outside the design specifications.	NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
M-7c Implementation Schedule is Provided	270.24(a); 264.1033(a)(2)	66270.24(a); 66264.1033(a)(2)	A schedule shall be provided when facilities cannot install a closed-vent system and control device to comply with Chapter 14 on date facility is subject to requirements.	NA	
M-7d Performance Test Plan is Provided	270.24(c); 264.1035(b)(3)	66270.24(c); 66264.1035(b)(3)	A performance test plan shall be provided where owner/operator applies for permission to use control device other than thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system, and chooses to use test data to determine organic removal efficiency achieved by control device.	NA	

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SECTION N. ARTICLE 28, AIR EMISSION STANDARDS FOR EQUIPMENT LEAKS (SUBPART BB)

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
N-1a Applicability	270.14(a); 270.25; 264.1050(b),(d)	66270.14(a); 66270.25; 66264.1050(b),(d)	Except as otherwise specified, this subpart applies to equipment that contains or contacts hazardous waste with organic concentrations of at least 10 percent by weight that are managed in one of the following: if these operations are conducted in; a unit subject to the permitting requirements of chapter 20; a unit (including a hazardous waste recycling unit) that is not exempt from permitting under 66262.34(a) and is located at a hazardous waste management facility otherwise subject to permitting requirements; and a unit that is exempt from permitting under 66262.34(a) such as a 90-day tank or container.	NA	
N-1b Definition of Equipment	270.14(a); 270.25; 264.1031; 264.1051	66260.10; 66270.14(a); 66270.25; 66264.1051	Examples include: valve, pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, or flange.	NA	
N-1c Equipment in a Vacuum or Equipment that Contains or Contacts Hazardous Waste with an Organic Concentration of at Least 10 Percent by Weight for a Period of Less than 300 Hours per Calendar Year is Excluded from Requirements at 66264.1052 to 66264.1060.	270.14(a); 270.25; 264.1050(f)	66270.14(a); 66270.25; 66264.1050(f)	Equipment shall be identified in a log in facility's operating record as required by 66264.1064(g) in order to qualify for exclusion.	NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
N-2a Monthly Monitoring for Leaks	270.25(d); 264.1052(a)(1)	66270.25(d); 66264.1052(a)(1)		NA	
N-2b Visual Inspection for Pump Seal Leakage on a Weekly Basis	270.25(d); 264.1052(a)(2)	66270.25(d); 66264.1052(a)(2)		NA	
N-2c Leak Detection	270.25(d); 264.1052(b); 264.1063	66270.25(d); 66264.1052(b); 66264.1063	Leak detected if: (1) leak detection instrument reads 10,000 parts per million (ppm) or greater, or (2) there are indications of liquid dripping from the pump seal.	NA	
N-2d Leak Repair as Soon as Practicable	270.25(d); 264.1052(c); 264.1059	66270.25(d); 66264.1052(c); 66264.1059	Repairs are to be made within 15 calendar days after detection. Repair extensions are allowed under conditions specified in 66264.1059.	NA	
N-2e Specific Exceptions to these Standards	270.25(d); 264.1052(d - f)	66270.25(d); 66264.1052(d - f)	Exceptions to these standards are dual mechanical seal systems or no detectable emissions.	NA	
N-3a Barrier Fluid Pressure Greater than the Compressor Stuffing Box Pressure	270.25(d); 264.1053(b)(1)	66270.25(d); 66264.1053(b)(1)		NA	
N-3b Barrier Fluid System Connected by a Closed-Vent System to a Control Device as Described in Article 27	270.25(d); 264.1053(b)(2)	66270.25(d); 66264.1053(b)(2)		NA	

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SECTION N. ARTICLE 28, AIR EMISSION STANDARDS FOR EQUIPMENT LEAKS (SUBPART BB)

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
N-3c No Detectable Atmospheric Emissions of Hazardous Contaminants from the Barrier System	270.25(d); 264.1053(b)(3)	66270.25(d); 66264.1053(b)(3)		NA	
N-3d Sensors Checked Daily or an Audible Alarm Checked Monthly	270.25(d); 264.1053(d - c)	66270.25(d); 66264.1053(d - c)		NA	
N-3e Leak Detection	270.25(d); 264.1053(f)	66270.25(d); 66264.1053(f)	A leak is detected if sensor indicates failure of: (1) seal system, or (2) barrier fluid system.	NA	
N-3f Leak Repair as Soon as Practicable	270.25(d); 264.1053(g) (1); 264.1059	66270.25(d); 66264.1053(g) (1); 66264.1059	Repairs are to be made within 15 calendar days after detection. Repair extensions are allowed under conditions specified in 66264.1059.	NA	
N-3g Specific Exceptions to these Standards	270.25(d); 264.1053(h - i)	66270.25(d); 66264.1053(h - i)	Exceptions to these standards are certain closed vent systems or no detectable emissions.	NA	
N-4a Except During Pressure Releases, No Pressure Relief Device Shall Release Detectable Emissions	270.25(d); 264.1054(a)	66270.25(d); 66264.1054(a)	Emissions shall be less than 500 ppm above background levels.	NA	

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SECTION N. ARTICLE 28, AIR EMISSION STANDARDS FOR EQUIPMENT LEAKS (SUBPART BB)					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
N-4b As soon as practicable, but no later than 24 hrs after a Pressure Release, No Detectable Emissions Shall Emanate from Pressure Released Device. 40 CFR states within 5 Calendar Days after a Pressure Release, No Detectable Emissions shall Emanate from Pressure Released Device	270.25(d); 264.1054(b)	66270.25(d); 66264.1054(b)	Emissions shall be less than 500 ppm above background levels.	NA	
N-4c Specific Exceptions to These Standards	270.25(d); 264.1054(c)	66270.25(d); 66264.1054(c)	Exceptions to these standards are certain closed vent systems.	NA	
N-5a Each Sampling Connecting System Shall Be Equipped with a Closed-Purge, Closed Loop, or Closed-Vent System. Closed-Vent Systems and Control Devices are also Subject to 66264.1033	270.25(d); 264.1055 (a - b); 264.1060	66270.25(d); 66264.1055 (a - b); 66264.1060	Each closed-purge, closed-loop, or closed-vent system shall either: (1) return purged process fluid directly to process line, (2) collect and recycle purged process liquid, or (3) be designed and operated to capture and transport all purged process fluid to a waste management unit or control device that satisfies applicable requirements.	NA	
N-5b Exemption for Qualified Sampling Systems	270.25(d); 264.1055(c)	66270.25(d); 66264.1055(c)	In situ sampling systems and sampling systems without purges are exempt from requirements of 66264.1055(a),(b).	NA	
N-6a Open-Ended Valve or Line	270.25(d); 264.1056(a), (c)	66270.25(d); 66264.1056(a), (c)	A double block or bleed system must comply with the open-ended valve or line requirements.	NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
N-6b Second Valve	270.25(d); 264.1056(b)	66270.25(d); 66264.1056(b)	A second valve shall be operated such that primary valve shall be closed before second valve is opened.	NA	
N-7 Monitoring Schedule Based on Detection of Leaks and Predetermined Schedule	270.25(d); 264.1057(a - e)	66270.25(d); 66264.1057(a - e)	A reading of 10,000 ppm denotes a detected leak.	NA	
N-7d Specific Exceptions to the Monitoring Schedule	270.25(d); 264.0157 (f - h); 264.1061; 264.1062	66270.25(d); 66264.1052 (f - h); 66264.1061; 66264.1062	Exceptions to schedule include unsafe-to-monitor valves, no detectable emissions, and difficult-to-monitor valves.	NA	
N-8a Monitoring	270.25(d); 264.1058(a); 264.1063(b)	66270.25(d); 66264.1058(a); 66264.1063(b)	Monitoring is required within 5 days after leak is found by sight, sound, smell, or other detection method.	NA	
N-8b Leak Detection	270.25(d); 264.1058(b)	66270.25(d); 66264.1058(b)	A leak is detected if a leak detection instrument reads 10,000 ppm or greater.	NA	
N-8c Leak Repair as Soon as Practicable	270.25(d); 264.1058(c); 264.1059	66270.25(d); 66264.1058(c); 66264.1059	Repairs are to be made within 15 calendar days after detection. The first attempt at repair shall be made no later than 5 calendar days after each leak is detected. Repair extensions are allowed under conditions specified in 66264.1059.	NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
N-8d Any Connector that is Inaccessible or is Ceramic or Ceramic-Lined is Exempt from the Monitoring Requirements of 66264.1058(a) and 66264.1064	270.25(d); 264.1058(e)	66270.25(d); 66264.1058(e)	Examples of ceramic-lined connectors include porcelain, glass, or glass-lined connectors.	NA	
N-9 Specific Allowances for Delay of Repair for Various Types of Equipment	270.25(d); 264.1059	66270.25(d); 66264.1059		NA	
N-10 When Closed-Vent Systems and Control Devices are Used, they Must Comply with the Requirements in Article 27	270.25(e); 264.1033; 264.1060	66270.25(e); 66264.1033; 66264.1060		NA	
N-11 An Owner/Operator may Elect to Comply with this Alternative Monitoring Program	270.25(e); 264.1061	66270.25(e); 66264.1061	No greater than 2 percent of the valves are allowed to leak per monitoring period.	NA	
N-12 An Owner/Operator may Elect to Comply with this Alternative Work Practice	270.25(e); 264.1062	66270.25(e); 66264.1062	Relief of monitoring frequency is allowed if less than 2 percent of the valves are leaking.	NA	
N-13 Owner Complies with Recordkeeping Requirements	270.25(a); 264.1064	66270.25(a); 66264.1064	Depending on the type of requirement, various records must be maintained in the facility operating record.	NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
N-13a Semiannual Report	270.25(a); 264.1065	66270.25(a); 66264.1065	A semiannual report is only required if leaks from equipment have gone unrepaired or a control device operates outside the design specifications.	NA	
N-13b Implementation Schedule	270.25(b)	66270.25(b)	An implementation schedule shall be provided if facility cannot install closed-vent system and control device to comply with provisions of Chapter 14, Article 28, on the effective date that facility becomes subject to provisions of Chapter 14 and 15.	NA	
N-13c Performance Test Plan	270.25(c)	66270.25(c)	A performance test plan shall be provided if the owner/operator applies for permission to use a control device for other than a thermal vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system and chooses to use test data to determine the organic removal efficiency achieved by the control device.	NA	

Notes:

- ^a Considerations in addition to the requirements presented in the regulations.
- ^b For each requirement, this column must indicate one of the following: NA for not applicable, IM for information missing, or the exact location of the information in the application.
- ^c If application is deficient in an area, prepare a comment describing the deficiency, attach it to the checklist, and reference the comment in this column.

SECTN.WPD

Reviewer: _____

Checklist Revision Date (March 1999)

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PERMIT COMPLETENESS CHECKLIST**SECTION O. AIR EMISSION STANDARDS FOR CONTAINERS, TANKS, AND SURFACE IMPOUNDMENTS (SUBPART CC)**

Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
O-1 Standards Apply to All Facilities That Treat, Store, or Dispose of Hazardous Waste in Tanks, Surface Impoundments, or Containers Subject to chapter 14, articles 9, 10 or 11, Except as Provided Otherwise	270.14(a); 270.27; 264.1080 (a) - (d)	66270.14(a); 66270.27; 66264.1080 (a) - (d)	Exclusions from 66264.1080(a) are listed at 66264.1080(b) (e.g., a container that has a design capacity less than or equal to 0.1 cubic meters [m ³]).	Part B Permit.	
O-2 Following is a List of Units that are Exempt from the 66264.1084-66264.1087 Standards:	270.14(a); 270.27; 264.1082(c)	66270.14(a); 66270.27; 66264.1082(c)		NA	
O-2a A Tank, Surface Impoundment, or Container for Which All Hazardous Waste Entering the Unit Has an Average Volatile Organic Concentration at the Point of Waste Origination of less than 500 Parts per Million by Weight (ppmw)	270.14(a); 270.27; 264.1082(c)(1)	66270.14(a); 66270.27; 66264.1082(c)(1)	Waste determination procedures are specified at 66264.1083.	Section VII-D	
O-2b A Tank, Surface Impoundment, or Container for Which the Organic Content of all the Hazardous Waste Entering the Waste Management Unit has been Reduced by an Organic Destruction or Removal Process that Achieves Specified Criteria	270.14(a); 270.27; 264.1082(c)(2)	66270.14(a); 66270.27; 66264.1082(c)(2)	Waste determination procedures are specified at 66265.1084(b)(2)-(b)(9).	Section VII-D	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
O-2c A Tank Used for Biological Treatment of Hazardous Waste that Destroys or Degrades the Organics Contained in the Hazardous Waste such that the Requirements of 66264.1082(c)(2)(D) are Met	270.14(a); 270.27; 264.1082(c)(3)	66270.14(a); 66270.27; 66264.1082(c)(3)	Waste determination procedures are specified at 66264.1083(b) and 66264.1083(a).	NA	
O-2d A Tank, Surface Impoundment or Container for Which all Hazardous Waste Placed in the Unit Meets Applicable Organic Concentration Limits or has been Treated by Appropriate Treatment Technology	270.14(a); 270.27; 264.1082(c)(4)	66270.14(a); 66270.27; 66264.1082(c)(4)	Waste determination procedures are specified at chapter 18.	Section VII-D	
O-2e A Tank Located Inside an Enclosure Vented to a Control Device that is Used for Bulk Feed of Hazardous Waste to a Waste Incinerator that Meets Specified Criteria	270.14(a); 270.27; 264.1082(c)(5)	66270.14(a); 66270.27; 66264.1082(c)(5)	Design and operation of the control device and enclosure shall satisfy 40 CFR, Part 61, Subpart FF; 52.741, Appendix B; and other conditions as specified.	NA	
O-3 Several Waste Determination Procedures are Explained in Detail and Must be Followed in Order to Demonstrate the Various article 30 and/or Control Requirements	270.14(a); 270.27; 264.1083; 265.1084	66270.14(a); 66270.27; 66264.1083; 66265.1084	In general, an owner or operator need <u>not</u> undergo waste determination procedures unless they are pursuing an exemption from the chapter14, Article 30 (Subpart CC regulations.)	Section VII-D	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
O-4 Tanks that Satisfy the Conditions at 264.1084(b)(1)(i-iii) Can Use Tank Level 1 or Tank Level 2 Controls. Tanks that do not Satisfy Conditions Shall Use Tank Level 2 Controls	270.14(a); 270.27; 264.1084(b)(1), (2)	66270.14(a); 66270.27; 66264.1084(b)(1), (2)		NA	
O-5a The Conditions at 66264.108(b)(1)(A-C) Provide that Hazardous Waste in the Tank Shall:	270.14(a); 270.27; 264.1084(b)(1)	66270.14(a); 66270.27; 66264.1084(b)(1)		NA	
O-5a(1) Have Maximum Organic Vapor Pressure Which is less than Maximum Organic Vapor Pressure Limit for Tank's Design Capacity Category	270.14(a); 270.27; 264.1084(b)(1)(i)	66270.14(a); 66270.27; 66264.1084(b)(1)(A)		NA	
O-5a(2) Not be Heated to Temperature Greater than Temperature at Which Maximum Organic Vapor Pressure of Waste is Determined for Purposes of Compliance	270.14(a); 270.27; 264.1084(b)(1)(ii)	66270.14(a); 66270.27; 66264.1084(b)(1)(B)		NA	
O-5a(3) Not be Treated Using a Waste Stabilization Process, as Defined in 66260.10	270.14(a); 270.27; 264.1084(b)(1)(iii)	66270.14(a); 66270.27; 66264.1084(b)(1)(C)	A waste stabilization process includes mixing hazardous waste with binders or other materials, and curing resulting hazardous waste and binder mixture.	NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
O-5b Maximum Organic Vapor Pressure Determination	270.14(a); 270.27; 264.1084(c) (1)	66270.14(a); 66270.27; 66264.1084(c)(1)	Must be determined before first time waste placed in tank, and retested whenever changes could cause it to increase above the maximum vapor pressure limit [66264.1084(b)(1)(A)].	NA	
O-5b(1) Tank Level 1. Owner/Operator Shall Equip Tanks with Fixed Roof and Closure Devices as Needed	270.14(a); 270.27; 264.1084(c)(2), (3)	66270.14(a); 66270.27; 66264.1084(c)(2), (3)	Fixed roof/closure devices shall form continuous barrier over entire waste in tank; contain no visible open spaces between roof section joints or between interface of roof edge and tank wall; contain openings with closure devices or closed-vent system; and be made of suitable materials.	NA	
O-5b(2) Tank Level 2. Owner/Operator Shall Use One of the Following Tanks:	270.14(a); 270.27; 264.1084(d)	66270.14(a); 66270.27; 66264.1084(d)		NA	
O-5b(2)(i) Fixed Roof Tank Equipped with Internal Floating Roof	270.27(a)(1); 264.1084(d)(1), (e)	66270.27(a)(1); 66264.1084(d)(1), (e)	Internal floating roof shall be designed to float on liquid surface, except when supported by leg supports; be equipped with continuous seal between tank wall and floating roof edge; and meet other design specifications.	NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
O-5b(2)(ii) Tank Equipped with an External Floating Roof	270.27(a)(1); 264.1084(d)(2), (f)	66270.27(a)(1); 66264.1084(d)(2), (f)	External floating roof shall be designed to float on all liquid surface, except when supported by leg supports; be equipped with two continuous seals; and meet other design specifications.	NA	
O-5b(3) Tank Vented Through Closed-Vent System to a Control Device	270.14(a); 270.27; 264.1084(d)(3), (g)	66270.14(a); 66270.27; 66264.1084(d)(3), (g)	Fixed roof/closure devices shall form continuous barrier over entire liquid surface; be made of suitable materials; and satisfy 66264.1087 standards.	NA	
O-5c Pressure Tank	270.14(a); 270.27; 264.1084(d)(4), (h)	66270.14(a); 66270.27; 66264.1084(d)(4), (h)	Tank shall be designed not to bend to atmosphere as result of compression of vapor headspace in tank, and be equipped with closure devices as needed.	NA	
O-5d Tank Located Inside an Enclosure that is Vented Through a Closed-Vent System to an Enclosed Combustion Control Device	270.14(a); 270.27; 264.1084(d)(5), (1)	66270.14(a); 66270.27; 66264.1084(d)(5), (1)	Tank shall be located in enclosure that is vented through closed vent system to enclosed combustion device, and enclosure shall be equipped with safety devices as needed.	NA	
O-5e Tank Level 1. Owner/Operator Shall:	270.14(a); 270.27; 264.1084(c)(1),(3)	66270.14(a); 66270.27; 66264.1084(c)(1),(3)		NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
O-5e(1) Determine Maximum Organic Vapor Pressure for Hazardous Waste Initially and Whenever Changes could Cause the Vapor Pressure to Increase Above the Maximum Organic Vapor Pressure Limit	270.14(a); 270.27; 264.1084(c)(1)	66270.14(a); 66270.27; 66264.1084(c)(1)	Maximum organic vapor pressure shall be determined using 66264.1083(c) procedures.	NA	
O-5e(2) Ensure that, Whenever Hazardous Waste is in Tank, the Fixed Roof is Installed with Each Closure Device Secured in Closed Position			Exceptions are listed at 66264.1084(c)(3)(A-C).	NA	
O-5e(3) Inspect the Air Emission Control Equipment	270.14(a); 270.27; 264.1084(c)(4)	66270.14(a); 66270.27; 66264.1084(c)(4)		NA	
O-5f Tank Level 2. Owner/Operators Shall Adhere to the Following Operating Procedures for Each Unit Type:	270.14(a); 270.27; 264.1084(e)	66270.14(a); 66270.27; 66264.1084(e)		NA	
O-5f(1) Fixed Roof Tank Equipped with Internal Floating Roof	270.14(a); 270.27; 264.1084(e) (2),(3)	66270.14(a); 66270.27; 66264.1084(e)(2),(3)	When floating roof is resting on leg supports, filling, emptying, or refilling shall be continuous and completed as soon as practical; when roof is floating, automatic bleeder vents shall be set closed; and prior to filling, openings in roof shall be secured. Inspect the floating roof.	NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
O-5f(2) Tank Equipped with an External Floating Roof	270.14(a); 270.27; 264.1084(f)(2),(3)	66270.14(a); 66270.27; 66264.1084(f)(2),(3)	When floating roof is resting on leg supports, filling, emptying, or refilling shall be continuous and completed as soon as practical; when closure device is open for access, equipment and devices shall be closed and secured as specified; and seals shall provide a continuous and complete cover as specified. Inspect the floating roof.	NA	
O-5f(3) Tank Vented Through Closed-Vent System to a Control Device	270.14(a); 270.27; 264.1084(g)(2), (3)	66270.14(a); 66270.27; 66264.1084(g)(2), (3)	When hazardous waste is in tank, fixed roof shall be installed with closure devices secured in closed position and vapor headspace underneath fixed roof vented to control device, except as specified. Inspect and monitor the air emission control equipment.	NA	
O-5f(4) Pressure Tank	270.14(a); 270.27; 264.1084(h)(2), (3)	66270.14(a); 66270.27; 66264.1084(h)(2), (3)	When hazardous waste is in tank, it shall be operated as closed system that does not vent to atmosphere, except to avoid an unsafe condition.	NA	
O-5f(5) Tank Located Inside an Enclosure that is Vented Through a Closed-Vent System to an Enclosed Combustion Control Device	270.27(a)(3), 264.1084(i)	66270.27(a)(3), 66264.1084(i)	Enclosure shall be operated in accordance with 40 CFR, 52.741, Appendix B, and comply with applicable closed-vent requirements. Safety devices may be operated as needed. Inspect and monitor the system and control device.	NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
O-5f(6) Shall be Conducted Using Continuous Hard-Piping or Another Closed System that Does Not Allow Exposure of Hazardous Waste to Environment	270.14(a); 270.27; 264.1084(j)(1)	66270.14(a); 66270.27; 66264.1084(j)(1)	Requirements do not apply under the conditions specified at 66264.1084(j)(2).	NA	
O-6a Owner/Operators Shall Install Either of the Following Controls:	270.14(a); 270.27; 264.1085(b)(d)	66270.14(a); 66270.27; 66264.1085(b)(d)		NA	
O-6a(1) Floating Membrane Cover	270.27(a)(4); 264.1085 (b)(1), (c)(1)	66270.27(a)(4); 66264.1085 (b)(1), (c)(1)	Floating membrane cover shall float on liquid surface and form continuous barrier over entire liquid; be made of synthetic membrane material; contain no visible open spaces; and be equipped with closure devices and cover drains as needed.	NA	
O-6a(2) Cover That Is Vented Through a Closed-Vent System to a Control Device	270.14(a); 270.27; 264.1085(b)(2) and (d)(2)	66270.14(a); 66270.27; 66264.1085(b)(2) and (d)(2)	Cover/closure devices shall form continuous barrier over entire liquid surface; be equipped with closure device; be made of suitable material; and be designed in compliance with 66264.1087.	NA	
O-6b Owner/Operators Shall Adhere to the Following Operating Procedures for Each Control Type:	270.14(a); 270.27; 264.1085(c), (d)	66270.14(a); 66270.27; 66264.1085(c), (d)		NA	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
O-6b(1) Floating Membrane Cover	270.14(a); 270.27; 264.1085(c)(2), (3)	66270.14(a); 66270.27; 66264.1085(c)(2), (3)	When hazardous waste is in surface impoundment, floating membrane cover shall float on liquid, and each closure device shall be secured in closed position, except as specified. Inspect the cover.	NA	
O-6b(2) Cover that is Vented Through a Closed-Vent System to a Control Device	270.14(a); 270.27; 264.1085(d) (2), (3)	66270.14(a); 66270.27; 66264.1085(d) (2), (3)	When hazardous waste is in surface impoundment, cover shall be installed with each closure device secured in closed position and vapor headspace underneath the cover vented to control device, except as specified. Closed-vent system and control device shall be operated in accordance with 66264.1087. Inspect and monitor the control device.	NA	
O-7 Shall be Conducted Using Continuous Hard-Piping or Another Closed System	270.14(a); 270.27; 264.1085(c)(1)	66270.14(a); 66270.27; 66264.1085(c)(1)	Requirements do not apply under conditions specified at 66264.1085(e)(2).	NA	
O-8a Container Level 1 Standards Apply to:	270.14(a); 270.27; 264.1086(b)(1)	66270.14(a); 66270.27; 66264.1086(b)(1)		NA	
O-8a(1) Container with Design Capacity Greater than 0.1 m ³ and less than or Equal to 0.46 m ³	270.14(a); 270.27; 264.1086(b)(1)(i)	66270.14(a); 66270.27; 66264.1086(b)(1)(A)		Section VII-D	

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SECTION O. AIR EMISSION STANDARDS FOR CONTAINERS, TANKS, AND SURFACE IMPOUNDMENTS (SUBPART CC)					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
O-8a(2) Container with Design Capacity Greater than 0.46 m ³ that is not in Light Material Service	270.14(a); 270.27; 264.1086(b)(1)(ii)	66270.14(a); 66270.27; 66264.1086(b)(1)(B)		Section VII-D	
O-8ab Container Level 2 Standards Apply to Container with a Design Capacity Greater than 0.46 m ³ that is in Light Material Service	270.14(a); 270.27; 264.1086(b)(1)(iii)	66270.14(a); 270.27; 66264.1086(b)(1)(C)		Section VII-D	
O-8c Container Level 3 Standards Apply to Container with Design Capacity Greater than 0.1 m ³ that is Used for Stabilization	270.14(a); 270.27; 264.1086(b)(2)	66270.14(a); 66270.27; 66264.1086(b)(2)	Level 3 standards apply at those times during waste stabilization process when hazardous waste in container is exposed to atmosphere.	Section VII-D	
O-9 Identify Each Container Area Subject to Article 30 (Subpart CC)	270.27(a)(2)	66270.27(a)(2)		Section VII-D	
O-9a Container Level 1. A Container Using Level 1 Controls is Defined as One of the Following:	270.27(a)(2); 264.1086(c)(1)	66270.27(a)(2); 66264.1086(c)(1)		Section VII-D	
O-9a(1) Container that Meets Department of Transportation Regulations on Packaging	270.27(a)(2); 264.1086(c)(1)(i),(f)	66270.27(a)(2); 66264.1086(c)(1)(A),(f)	Container shall meet Part 178 or Part 179 and be managed in accordance with Parts 107, 172, 173, and 180.	Section VII-D, Table V-1	
O-9a(2) Container Equipped with Cover and Closure Devices	270.27(a)(2); 264.1086(c)(1)(ii),(2)	66270.27(a)(2); 66264.1086(c)(1)(B),(2)	Container shall be equipped with covers and closure devices, as needed.	Section VII-D	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
O-9a(3) Open-Top Container Equipped with Organic-Vapor Suppressing Barrier	270.27(a)(2); 264.1086(c) (1)(iii),(2)	66270.27(a)(2); 66264.1086(c) (1)(C),(2)	Container shall be equipped with covers and closure devices, as needed.	Section VII-D	
O-9b Container Level 2. A Container Using Level 2 Controls is Defined as One of the Following:	270.27(a)(2); 264.1086 (d)(1)(f),(g)	66270.27(a)(2); 66264.1086(d)(1)(f), (g)		Section VII-D	
O-9b(1) Container that Needs Department of Transportation (DOT) Regulations on Packaging	270.27(a)(2); 264.1086(d)(1) (i),(f)	66270.27(a)(2); 66264.1086(d)(1)(A), (f)	Containers shall meet Part 178 or Part 179, and be managed in accordance with Parts 107, 172, 173, and 180.	Section VII-D, Table V-1	
O-9b(2) Container that Operates with No Detectable Organic Emissions	270.27(a)(2); 264.1086(d)(1) (ii),(g)	66270.27(a)(2); 66264.1086(d)(1)(B), (g)	Owner/operator shall follow the procedures at 66264.1086(g) and 66265.1084(d) to determine no detectable organic emissions.	Section VII-D	
O-9b(3) Container that has been Demonstrated Within the Preceding 12 Months to be Vapor-Tight	270.27(a)(2); 264.1086(d)(1) (iii) and (h)	66270.27(a)(2); 66264.1086(d)(1)(C) and (h)	Owner/operator shall follow procedures at 66264.1086(h) and 40 CFR, Part 60, Appendix A, Method 27 to demonstrate container is vapor-tight.	Section VII-D	
O-9c Container Level 3. A Container Using Level 3 Controls is Defined as One of the Following:	270.27(a)(2); 264.1086(e)(1), (2)	66270.27(a)(2); 66264.1086(e)(1), (2)		Section VII-D	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
O-9c(1) Container that is Vented Directly Through a Closed-Vent System to a Control Device	270.27(a)(2); 264.1086(e)(1)(i)	66270.27(a)(2); 66264.1086(e)(1)(A)	The closed-vent system and control device shall be designed in accordance with 66264.1087. Safety devices may be installed as needed.	Section VII-D	
O-9c(2) Container that is Vented Inside an Enclosure Which is Exhausted Through a Closed-Vent System to a Control Device	270.27(a)(2); 270.27(a)(3); 264.1086(e)(1)(ii)	66270.27(a)(2); 66270.27(a)(3); 66264.1086(e)(1)(B)	The container/enclosure must be designed in accordance with 40 CFR, 52.741, Appendix B and 66264.1087. Safety devices may be installed as needed.	Section VII-D	
O-10a Container Level 1. Owner/Operators Shall Install Covers and Closure Devices for the Container and Secure and Maintain Each Closure Device in Closed Position, Except as Specified	270.14(a); 270.27; 264.1086(c)(3), (4)	66270.14(a); 66270.27; 66264.1086(c)(3), (4)	The closure device or cover may be opened for the purpose of adding or removing hazardous waste or for maintenance or to avoid unsafe conditions.	Section VII-D	
O-10b Container Level 2. Owner/Operator Shall Install All Covers and Closure Devices for the Container and Maintain and Secure Each Closure Device in Closed Position, Except as Specified	270.14(a); 270.27; 264.1086(d)(2), (3)	66270.14(a); 66270.27; 66264.1086(d)(2), (3)	Transfer of hazardous waste in or out of container shall be conducted in such a manner as to minimize exposure to atmosphere, as practical. The closure device or cover may be opened for the purpose of adding or removing hazardous waste or for maintenance or to avoid unsafe conditions.	Section VII-D	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
O-10c Container Level 3. Owner/Operators Shall Operate the System in Accordance with 52.741, Appendix B; 66264.1087; and 66265.1081, as Needed	270.14(a); 270.27; 264.1086(e) (3),(4), (5)	66270.14(a); 66270.27; 66264.1086(e)(3),(4) & (5)		Section VII-D	
O-11a Standards Apply to Each Closed-Vent System and Control Device Used to Control Air Emissions under Chapter 14; Article 30	270.14(a); 270.27; 264.1087(a)	66270.14(a); 66270.27; 66264.1087(a)		Section VII-D	
O-11(b) Closed-Vent Systems Shall:	270.27(a)(5); 264.1087(b)	66270.27(a)(5); 66264.1087(b)		Section VII-D	
O-11b(1) Route Gases, Vapors, and Fumes to Control Device	270.27(a); 264.1087(b)(1)	66270.27(a); 66264.1087(b)(1)		Section VII-D	
O-11b(2) Be Designed and Operated in Accordance with 66264.1033(k)	270.27(a); 264.1087(b)(2)	66270.27(a); 66264.1087(b)(2)	The Chapter 14, Article 27 standards for closed-vent systems must be satisfied.	Section VII-D	
O-11b(3) Meet the Requirements for Bypass Devices, if Applicable	270.27(a); 264.1087(b)(3)	66270.27(a); 66264.1087(b)(3)	Each bypass device shall be equipped with either a flow indicator or a seal or locking device.	Section VII-D	
O-12a The Control Device Shall be One of the Following:	270.27(a)(5); 264.1087(c)(1)	66270.27(a)(5); 66264.1087(c)(1)		Section VII-D	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
O-12a(1) A Control Device Designed and Operated to Reduce Total Organic Content on Inlet Vapor Stream Vented to the Control Device by at Least 95 Percent by Weight	270.27(a)(5); 264.1087(c)(1)(i)	66270.27(a)(5); 66264.1087(c)(1)(A)	Owner/operator shall demonstrate compliance using either performance test or design analysis, except as specified.	Section VII-D	
O-12a(2) An Enclosed Combustion Device	270.27(a)(5); 264.1087(c)(1)(ii)	66270.27(a)(5); 66264.1087(c)(1)(B)	Owner/operator shall demonstrate compliance using either performance test or design analysis, except as specified. Control device shall be designed and operated in accordance with 66264.1033(c).	Section VII-D	
O-12a(3) A Flare	270.27(a)(5); 264.1087(c)(1)(iii)	66270.27(a)(5); 66264.1087(c)(1)(C)	Owner/operator shall demonstrate compliance using either performance test or design analysis, except as specified.	Section VII-D	
O-12b Each Closed-Vent System and Control Device Shall Comply with the Operating Requirements of 66264.1087(c)(2)	270.27(a)(5); 264.1087(c)(2)	66270.27(a)(5); 66264.1087(c)(2)	Planned routine maintenance of control device shall not exceed 240 hours per year; system malfunctions shall be corrected as soon as practicable; and system shall be operated such that gases, vapors, or fumes are not actively vented to control device during planned maintenance or system malfunction, except as specified.	Section VII-D	
O-12c A Carbon Adsorption System	270.27(a)(5); 264.1087(c)(3)	66270.27(a)(5); 66264.1087(c)(3)	Carbon replacement and removal shall follow prescribed requirements in 66264.1033(g), (h), and (n).	Section VII-D	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
O-12d Each Control Device Shall be Operated and Maintained in Accordance with 66264.1033(j), Except for Certain Devices Identified (e.g., Flare)	270.27(a)(5); 264.1087(c)(4)	66270.27(a)(5); 66264.1087(c)(4)	66264.1033(j) requires the owner/operator to prepare documentation describing the control device's operation and to identify the process parameter(s) that indicate its proper operation and maintenance.	Section VII-D	
O-12e The Owner/Operator Shall Demonstrate that a Control Device Achieves the Performance Requirements Using a Performance Test or Design Analysis, Except for Specific Devices Identified (e.g., flare)	270.27(a)(5); 264.1087(c)(5)	66270.27(a)(5); 66264.1087(c)(5)	For performance test, owner/operator shall use the test specified at 66264.103(c). For design analysis, owner/operator shall use an analysis that meets requirements specified at 66264.1035(b)(4)(C).	Section VII-D	
O-12f If Design Analysis is Not Sufficient, then a Performance Test is Required	270.27(a)(5); 264.1087(c) (6)	66270.27(a)(5); 66264.1087(c)(6)		Section VII-D	
O-12h Inspect and Monitor the Control Device	270.27(a)(5); 264.1087(c) (7)	66270.27(a)(5); 66264.1087(c)(7)	Control devices shall be inspected and monitored at least once a day.	Section VII-D	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
O-13 Each Tank, Surface Impoundment and Container Shall be Inspected, Monitored, and Repaired in Accordance with the Chapter 14, Article 30 Requirements	270.27; 264.1088	66270.27; 66264.1088	Inspection, monitoring and repair requirements specific to each unit are located in the standards sections of the regulation 66264.1084 through 66264.1087. Owner/operator shall develop and implement written plan and schedule to perform inspections and monitoring required. The plan and schedule shall be incorporated into facility's inspection plan.	Section VII-D	
O-14 Each Owner/Operator Shall Comply with the Recordkeeping Requirements Specified at 66264.1089	270.27; 264.1089	66270.27; 66264.1089	Except as specified, records shall be maintained in facility's operating record for a minimum of 3 years. Various records are required depending on the type of unit and control device.	Section VII-D	
O-14a Each of the Following Owner/Operators Shall Comply with the Reporting Requirements at 66264.1090:	270.27; 264.1090	66270.27; 66264.1090		Section VII-D	
O-14a(1) Each Owner/Operator Managing Hazardous Waste in a Tank, Surface Impoundment, or Container Exempted from Using Air Emission Controls under 66264.1082(c)	270.27; 264.1090(a)	66270.27; 66264.1090(a)	Owner/operator shall report to DTSC each noncompliance identified under 66264.1082(c).	Section VII-D	

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Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
O-14a(2) Each Owner/operator Using Air Emission Controls on a Tank in Accordance with 66264.1084(c)	270.27; 264.1090(b)	66270.27; 66264.1090(b)	Owner/operator shall report to DTSC each noncompliance identified under 66264.1084(b).	NA	
O-14a(3) Each Owner/operator Using a Control Device in Accordance with 66264.1087	270.27; 264.1090 (c),(d)	66270.27; 66264.1090(c),(d)	Owner/operator shall submit semiannual written report to DTSC, except as specified.	Section VII-D	
O-14b Each Owner/Operator shall Provide an Emission Monitoring Plan	270.27(a)(6)	66270.27(a)(6)	Applies to Method 21 and control device monitoring methods.	Section VII-D	
O-14c Article 30 Implementation Plan	270.27(a)(7)	66270.27(a)(7)	Required when facility cannot comply with Chapter 14, Article 30 by date of permit issuance.	NA	

Notes:

- ^a Considerations in addition to the requirements presented in the regulations.
- ^b For each requirement, this column must indicate one of the following: NA for not applicable, IM for information missing, or the exact location of the information in the application.
- ^c If application is deficient in an area, prepare a comment describing the deficiency, attach it to the checklist, and reference the comment in this column.

SECTO.WPD

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Checklist Revision Date (March 1999)

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PERMIT COMPLETENESS CHECKLIST					
SECTION P. EXPOSURE INFORMATION					
Section and Requirement	Federal Regulation	State Regulation	Review Consideration ^a	Location in Application ^b	See Attached Comment Number ^c
P-1 Information on the Potential for the Public to be Exposed to Releases. At a Minimum, this must include: <ul style="list-style-type: none"> • reasonably foreseeable potential releases • potential pathways of human exposure • potential magnitude and nature of exposure 	270.10(j)	66270.10(j)	The federal requirement is for surface impoundments and land disposal units.	NA	

Notes:

- ^a Considerations in addition to the requirements presented in the regulations.
- ^b For each requirement, this column must indicate one of the following: NA for not applicable, IM for information missing, or the exact location of the information in the application.
- ^c If application is deficient in an area, prepare a comment describing the deficiency, attach it to the checklist, and reference the comment in this column.

SECTP.WPD

Reviewer: _____
Checklist Revision Date (March 1999)

V. Waste Management Equipment

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A. Introduction

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Attachment V-2	Solvent and Oxidant Incompatibility Chart for Polyethylene Vessels
Attachment V-3	Chemical Resistance Information for Steel Vessels
Attachment V-4	Detailed Drawing and Specifications for Typical Polyethylene Vessel
Attachment V-5	Detailed Drawings and Specifications for Typical Steel Vessels

V. Waste Management Equipment

A. Introduction

The HWTSF manages wastes only in containers. There are no hazardous waste tanks in the HWTSF.

Small quantity containers include small pails and drums.

Larger containers are referred to as vessels. Although commonly referred to as poly tanks and steel tanks, they do not meet the regulatory definition of tanks.

Vessels are rented as needed for storage and/or treatment of wastes. Vessels are typically rented for periods of 3 to 6 months, though occasionally vessels are rented for longer, consistent with applicable waste storage limits. After storage and/or treatment needs are complete, the vessels are decontaminated and returned to the appropriate contract company.

Vessels meet minimum design and construction standards as stated in Table V-1. Refer to Attachments V-4 and V-5 for detailed drawings regarding size and dimensions of typical vessels used in HWTSF storage areas.

**Table V-1
Waste Management Equipment**

Small Quantity Containers

Construction Materials	Container – Waste Compatibility
<p>The small quantity containers meet the Packaging Specifications in Title 49 CFR, §173, as referenced in the Hazardous Materials Table.</p> <p>There is no maximum container size, but the secondary containment requirements in Table VIII-2 must be complied with.</p>	<p>Compatibility of the container and waste is ensured by operating practices as found in Section VII, Operating Procedures.</p>

Polyethylene Vessels

Vessels are rented as needed for storage and/or treatment and meet minimum design and construction standards as stated below:

Design and Construction Standards	Construction Materials	Corrosion Resistance	Structural Support/ Foundation	Accessibility
<p>Capacity: The maximum capacity of a single polyethylene vessel will be a nominal capacity of 6,900 gallons. Smaller polyethylene vessels may be used. The specific size is dependent on what is commercially available to rent from 3rd party vendors.</p> <p>Pressure Rating: Designed to operate at atmospheric pressure at an operating temperature not to exceed 170°F.</p>	<p>The vessels are constructed of high density cross-linked polyethylene. The vessels have an ultimate tensile strength of 2600 psi.</p>	<p>The vessels are compatible with the chemicals listed on the typical manufacturer’s chemical resistance chart, shown as Attachment V-1. Also see Attachment V-2 for incompatibility with solvents and oxidants.</p>	<p>This type of vessel has a reinforced base which allows it to be moved from place to place without the use of platforms or special equipment.</p>	<p>Each polyethylene vessel has a covered threaded manway at the top which enables cleanout but does not allow entry. See also Section X, Inspections.</p>

Carbon Steel Vessels

These vessels are rented as needed for storage and/or treatment and meet minimum design and construction standards as stated below:

Design and Construction Standards	Construction Materials	Corrosion Resistance	Structural Support/ Foundation	Accessibility	Lightening Protection
<p>Capacity: The maximum capacity of a single steel vessel will be a nominal capacity of 21,000 gal. Smaller steel vessels may be used. The specific size is dependent on what is commercially available to rent from 3rd party vendors.</p> <p>Pressure Rating: Designed to operate at atmospheric pressure at an operating temperature not to exceed 170°F. A 0.5 psig pressure/vacuum relief valve on the top of the vessels guards against explosion by releasing pressure buildups.</p>	<p>The vessels are constructed of structural quality hot-rolled carbon steel. The vessels are all welded between plates and stiffeners. The structural steel has the following properties:</p> <ul style="list-style-type: none"> • Minimum yield point: 36,000 psi. • Tensile strength: 58,000 psi. 	<p>Compatible chemicals are designated as “C” or “D” on the chemical resistance chart provided in Attachment V-3.</p>	<p>This type of vessel has no foundation or supports.</p>	<p>The vapor tight vessels have hatch doors which enable easy access for cleanout and inspection. See also Section X, Inspections.</p>	<p>The vessels are inherently self-protecting against lightening.</p>

Table V-2

**Equipment and Devices Used for Hazardous Waste Handling:
Use, Capabilities, and Safety Features**

Name and Description	Use and Capabilities	Safety Features
Forklift	One industrial forklift truck is available to the HWTSF for transporting palletized and non-palletized small quantity containers, bins, and HWTSF supplies. Nominal lift capacity is typically ≤ 5000 lbs.	Equipped with roll bars, spark arresters, and lights. Maintenance and inspection of the vehicles is the responsibility of the contract rental company.
Grade-All	One industrial boomlift/reach forklift truck is available to the HWTSF for transporting palletized small quantity containers and moving larger HWTSF supplies. Also used for repositioning and cleaning of larger portable liquid containers. Nominal lift capacity is typically >5000 lbs.	Equipped with roll bars, spark arresters, and lights. Maintenance and inspection of the vehicles is the responsibility of the contract rental company.
Gasoline or diesel powered passenger/gear vehicles	One pickup truck is available to the HWTSF at all times for the transport of small quantity containers within the HWTSF.	All gasoline and diesel powered vehicles handling hazardous materials are equipped with spark arresters and safety-glass windshields as appropriate. Maintenance and inspection of the vehicles is the responsibility of the contract rental company.
Flatbed truck	On request, a flatbed truck is available to the HWTSF to transport small quantity containers and bins within the HWTSF.	Equipped with hydraulic features for safe loading and transport.
Vacuum trucks, diesel driven	On request, several vacuum trucks are available for moving liquids and semi-solids within the HWTSF.	Equipped with placards which indicate that the vehicle is carrying a hazardous material. Operators routinely visually inspect the trucks for leaks and equipment malfunctions. Maintenance and inspection of the vehicles is the responsibility of the contract rental company.
Bin trucks, diesel driven	On request, several Bin trucks are available to the HWTSF for moving bins of solid waste within the HWTSF.	Bin trucks used at the HWTSF minimize the potential for accidental releases through the use of hydraulic features which slowly roll bins into place.
Portable pumps, 4" & 6"	One of each size is available to the HWTSF at all times for the transfer of wastes.	
Air compressor	One air compressor is available to the HWTSF at all times for supplying compressed air used in treatment processes.	
Flexible Hoses	High grade black rubber reinforced with steel braiding, 150 psig pressure rated, are available to the HWTSF. The hoses are used to transfer wastes via mobile pumps.	Flexible hoses are used during liquid waste transfer operations to minimize the potential for accidental spills or releases. These hoses are made of durable high grade black rubber reinforced with steel braiding.
Portable Vessels	Storage and treatment of wastes.	Portable vessels used in the HWTSF are equipped with railings, safety ladders, and warning signs which indicate that the containers store and/or treat hazardous wastes. Examples of the typical warning signs are shown in Figure VII-5. When liquid wastes are delivered to the HWTSF, the containers are visually inspected before off-loading to ensure that the containers are not overfilled or leaking. The secondary containment system, which is described in more detail in Section VIII, is designed to safely contain a spill in the event of a container rupture or leak.
Labels and Signs	Waste and hazard identification.	Labels and signs are present throughout the HWTSF to alert personnel and visitors of chemical hazards around storage and treatment areas.

Attachment V-1

Chemical Resistance Chart

CHEMICAL RESISTANCE CHART
General Chemical Resistance Chart for
High Density Crosslink Polyethylene Tanks

It has been well documented over the years the types of chemicals that are compatible with polyethylene, either through tests or experience. It would be impossible to list all the chemicals that may be involved in use with polyethylene storage tanks. Therefore, the included tables are only representative of typical chemicals. Also, their rankings are specific to the application of chemical storage tanks and the superior properties of Marlex® CL-100 and CL-50. The following tables are to be used only as a guide for establishing those uses that would give satisfactory service. They are not a substitute for sound engineering.

TABLE I

The following chemicals do not attack nor permeate Marlex® CL-100 or CL-50 resins up to 150°F (65°C) each application should be considered individually. All concentrations apply except where noted.

Acetic Acid	Galllic Acid	Photographic Solutions
Aluminum Salts	Gluconic Acid	Propyl Alcohol
Alum	Glycol Ethers	Propylene Glycol
Ammonium Hydroxide	Glycolic Acid	Sea Water
Ammonium Salts	Hexanol	Selenic Acid
Amyl Alcohol	Hydrazine <35%	Sewage
Antimony Salts	Hydrazine Hydrochloride	Silicic Acid
Arsenic Acid	Hydroiodic Acid	Silver Salts
Barium Hydroxide	Hydrobromic Acid	Soap Solutions
Benzene Sulfonic Acid	Hydrochloric Acid	Sodium Ferricyanide
Bismuth Salts	Hydrofluoric Acid	Sodium Ferrocyanide
Boric Acid	Hydrofluorosilicic Acid	Sodium Hydroxide
Bromic Acid	Hydrogen Peroxide <52%	Sodium Hypochlorite <9%
Butanediol	Hydrogen Phosphide	Sodium Salts
Butyl Alcohol	Hydroquinone	Sodium Sulfonates
Calcium Hydroxide	Hypochlorous Acid	Stanic Salts
Calcium Salts	Iodine Solutions	Stannous Salts
Chromic Acid <50%	Lactic Acid	Starch Solutions
Citric Acid	Latex	Stearic Acid
Copper Salts	Lead Acetate	Sulfuric Acid <98%*
Detergents	Magnesium Salts	Sulfurous Acid
Diazo Salts	Mercuric Salts	Sugar Solution
Diethyl Carbonate	Mercurous Salts	Glucose
Diethanol Amine	Mercury	Lactose
Diethylene Glycol	Methyl Alcohol	Sucrose, etc.
Diglycolic Acid	Methylsulfuric Acid	Tannic Acid
Dimethylamine	Nickel Salts	Tanning Extracts
Dimethyl Formamide	Nicotinic Acid	Tartaric Acid
Ethyl Alcohol	Nitric Acid <50%	Titanium Salts
Ethylene Glycol	Oxalic Acid	Toluene Sulfonic Acid
Ferric Salts	Perchloric Acid	Triethanolamine
Ferrous Salts	Phenol <10%	Urea
Fluoboric Acid	Potassium Hydroxide	Vinegar
Fluosilicic Acid	Potassium Salts	Wetting Agents
Formic Acid	Phosphoric Acid	Zinc Salts

*Under some conditions acid will discolor.

This document reports accurate and reliable information to the best of our knowledge, but our suggestions and recommendations cannot be guaranteed because the conditions of use are beyond our control. Information presented herein is given without reference to any patent questions which may be encountered in the use thereof. Such questions should be investigated by those using this information. Phillips Chemical Company and Poly Cal Plastic, Inc. assumes no responsibility for the use of information presented herein and hereby disclaims all liability in regard to such use.

Tanks are manufactured for Ambient Temperatures or Less if usage is Above Ambient Temperature. Contact the factory.

POLY CAL PLASTICS, INC.

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Attachment V-2

**Typical Solvent and Oxidation Incompatibility
Chart for Polyethylene Vessels**

Acetaldehyde (CH ₃ CHO)	
Acetone (CH ₃ CO CH ₃)	C
Amyl Acetate (CH ₃ CO ₂ C ₅ H ₁₁)	C
Aqua Regia	
Benzene (C ₆ H ₆)	
Bromine (Gas or Liquid)	
Carbon Disulfide (CS ₂)	
Carbon Tetrachloride (CCl ₄)	
Chlorine	C
Chlorosulfuric Acid (ClSO ₂ HO)	
Creasol (CH ₃ C ₆ H ₄ OH)	
Cyclohexanone (C ₆ H ₁₀ O)	
Dibutyl Phthalate	C
Dimethylamine	C
Dioctyl Phthalate	
Ethyl Acetate (CH ₃ COO C ₂ H ₅)	
Ethyl Bromide	
Ethyl Butyrate	
Ethyl Chloride (CH ₃ CH ₂ Cl)	
Ethyl Ether (C ₂ H ₅ OC ₂ H ₅)	
Ethylene Chloride	
Ethylene Chlorohydrin	
Liquid Fluorine	C
Furfurol (C ₄ H ₃ OCHO)	
Furfuryl Alcohol	
Hydrogen Peroxide (Over 90%)	C
Iodine Solution	
Kerosene	
Methyl Bromide	C
Mineral Oil	
Nitric Acid Concentrate	
Nitrobenzene (C ₆ H ₅ NO ₂)	
Phenols	

Oleic Acid	
Oleum	
Ozone	C
Methyl Ethyl Ketone (CH ₃ CO CH ₂ CH ₃)	
Methylene Chloride (CH ₂ Cl ₂)	
Naphtha	
Ethylene Dichloride (CH ₂ Cl CH ₂ Cl)	
Carbon Bisulfide	
Propylene Dichloride	
Sulfuric Acid (Over 98%)	
Tetrahydrofuran	
Titanium Tetrachloride	C
Toluene	
Trichloroethylene	
Turpentine	
Xylene	C

C = May be compatible for low concentrations, pending results of waste-specific tests.

Attachment V-3**Chemical Resistance Information for Steel Vessel**

Corrosion of carbon steel can be severe with pH of less than 4 and greater than 12. Therefore, storage of materials with these pH ranges in carbon steel vessels should not exceed ~30 days.

Coated steel vessels may be capable of storing materials outside of these pH ranges.



3810 NORTH TULSA STREET
LAHOMA CITY, OKLAHOMA 73112
PHONE (405) 947-2511 • TELEX 748519

CHEMICAL RESISTANCE CHART

CHEMICAL RESISTANCE DATA

These recommendations are based upon information from material suppliers and careful examination of available published information and are believed to be accurate. However, since the resistance of metals, plastics and elastomers can be affected by concentration, temperature, presence of other chemicals and other factors, this information should be considered as a general guide rather than an unqualified guarantee. Ultimately, the customer must determine the suitability of the pump used in various solutions.

All recommendations assume ambient temperatures unless otherwise noted.

RATINGS — CHEMICAL EFFECT

- A—No effect—Acceptable
- B—Minor Effect—Acceptable
- C—Moderate effect—Questionable
- D—Severe effect—Not Recommended

FOOTNOTES

1. P.V.C.—Satisfactory to 72° F.
2. Polypropylene—Satisfactory to 72° F.
3. Polypropylene—Satisfactory to 120° F.
4. Buna-N—Satisfactory for "O" Rings
5. Polyacetal—Satisfactory to 72° F.
6. Ceramag—Satisfactory to 72° F.

The ratings for these materials are based upon the chemical resistance only. Added consideration must be given to pump selections when the chemical is abrasive, viscous in nature, or has a Specific Gravity greater than 1.1

NOTE: The materials shown below in **BOLDFACE TYPE** are used in the construction of Little Giant chemical pumps.

	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Aluminum	TITANIUM	HASTELLOY C	Cast Bronze	Brass	Cast Iron	Carbon Steel	PVC (Type 1)	Tygon (E-3606)	Teflon	Noryl	Polyacetal	Nylon	Cycloac (ABS)	Polyethylene	POLYPROPYLENE	RYTON	CARBON	CERAMIC	CERAMAGNET "A"	VITON	BUNA N (NITRILE)	Silicon	Neoprene	Ethylene Propylene (EPM)	Rubber (Natural)	Epoxy	
Acetaldehyde ⁴	A	A	A	-	B	A	A	D	-	C	D	D	A	-	A	A	D	C	B	A	A	A	A	-	A	B	B	D	B	C	A	
Acetamide	-	B	A	-	-	-	-	-	-	C	-	-	-	-	B	-	-	-	-	-	-	-	A	-	A	A	-	A	A	D	A	
Acetate Solv. ²	A	B	A	B	B	-	-	A	C	B	A	B	D	A	-	-	A	-	B	D	-	A	A	-	D	D	-	D	-	-	A	
Acetic Acid, Glacial ¹	-	B	A	A	B	A	A	C	C	D	A	C	B	A	C	D	D	D	B	B	A	A	A	-	D	D	B	C	B	C	B	
Acetic Acid 20%	-	-	A	-	-	A	A	-	C	-	-	B	-	A	A	-	D	-	-	A	A	-	A	-	D	C	-	C	-	-	B	
Acetic Acid 80%	-	-	A	-	-	A	A	-	C	-	-	D	-	A	B	-	D	-	-	B	-	-	A	-	D	C	-	D	-	-	B	
Acetic Acid	-	B	A	B	B	A	A	C	C	D	C	A	B	A	A	D	D	C	B	A	A	A	A	-	C	C	-	C	B	C	A	
Acetic Anhydride	B	A	A	B	B	A	A	C	D	B	D	D	D	A	D	D	D	D	A	A	A	A	A	-	D	A	C	B	B	C	A	
Acetone ⁴	A	A	A	B	A	A	A	A	A	A	A	D	D	A	D	B	A	D	C	B	A	A	A	A	D	D	B	C	A	D	B	
Acetyl Chloride	-	C	A	-	-	-	-	D	-	-	-	-	-	A	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	A	
Acetylene ²	A	A	A	A	A	-	-	B	-	A	A	B	-	-	A	A	-	-	D	A	A	A	-	A	A	C	B	A	C	A		
Acrylonitrile	A	A	C	-	B	-	B	A	-	C	-	-	-	-	B	-	D	-	B	A	A	A	-	C	D	-	D	D	-	A		
Alcohols																																
Amyl	A	A	A	-	C	A	A	A	B	C	C	A	B	A	C	A	A	B	B	B	A	A	A	-	A	A	D	A	A	C	A	
Benzyl	-	A	A	-	B	A	A	A	C	-	-	D	B	-	A	A	A	D	D	A	-	A	A	-	A	D	-	B	B	D	A	
Butyl	A	A	A	-	B	A	A	B	C	C	C	A	B	A	A	A	-	B	B	A	A	A	-	A	A	D	A	A	A	A	A	
Diacetone ²	-	A	A	-	A	A	A	A	C	-	A	D	-	-	A	A	A	-	-	D	-	A	A	-	D	-	D	A	D	A		
Ethyl	-	A	A	A	B	A	A	A	C	A	A	A	C	-	A	B	A	B	B	A	-	A	A	A	A	B	A	B	A	A		
Hexyl	-	A	A	-	A	A	A	A	C	-	A	A	-	-	A	A	A	-	-	A	-	A	A	-	A	A	D	B	A	A	A	
Isobutyl	-	A	A	-	B	A	A	A	C	-	A	-	-	-	A	A	B	-	-	-	A	A	-	A	C	B	A	A	A	A		
Isopropyl	-	A	A	-	B	A	A	A	C	C	A	-	-	-	A	A	A	-	-	A	-	A	A	-	A	C	C	B	A	A	A	
Methyl ⁴	-	A	A	A	B	A	A	A	A	C	A	A	B	-	A	A	C	A	D	B	A	-	A	A	C	B	-	A	A	A	A	
Octyl	-	A	A	-	A	A	A	A	C	A	-	A	-	-	A	A	A	-	-	-	A	A	-	A	A	C	B	-	B	A	C	A
Propyl	-	A	A	-	A	A	A	A	-	-	A	A	-	-	A	A	A	-	-	A	-	A	A	-	A	B	A	A	A	A	A	

- A—No effect—Acceptable
- B—Minor effect—Acceptable
- C—Moderate effect—Questionable
- D—Severe effect—Not Recommended

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2. Polypropylene—Satisfactory to 72° F.
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4. Buna-N—Satisfactory for "O" Rings
5. Polyacetal—Satisfactory to 72° F.
6. Ceramag—Satisfactory to 72° F.

	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Aluminum	TITANIUM	HASTELLOY C	Cast Bronze	Brass	Cast Iron	Carbon Steel	PVC (Type 1)	Tygon (E-3606)	Teflon	Noryl	Polyacetal	Nylon	Cycloac (ABS)	Polyethylene	POLYPROPYLENE	RYTON	CARBON	CERAMIC	CERAMAGNET "A"	VITON	BUNA N (NITRILE)	Silicon	Neoprene	Ethylene Propylene (EPM)	Rubber (Natural)	Epoxy									
Aluminum Chloride 20%	-	D	C	D	B	A	A	D	-	D	A	A	B	-	A	C	A	-	B	A	A	A	A	-	A	A	-	A	A	A	A									
Aluminum Chloride	C	D	C	-	D	C	A	C	-	D	B	A	A	A	A	A	-	D	-	-	A	A	A	A	-	A	A	C	A	-	-	A								
Aluminum Fluoride	-	D	C	D	-	D	B	-	-	-	A	A	-	-	A	A	C	D	-	B	A	-	A	-	-	A	A	C	A	-	-	C	A							
Aluminum Hydroxide*	-	A	A	A	A	-	-	A	-	D	A	A	-	-	A	B	A	-	-	A	-	-	A	A	A	A	-	A	-	-	A	A								
Alum Potassium Sulfate (Alum), 10%	-	A	-	-	A	-	B	-	-	D	A	A	-	-	A	-	-	-	A	-	-	A	A	A	-	A	-	-	A	-	-	A	A							
Alum Potassium Sulfate (Alum) 100%	-	D	A	B	B	-	B	C	-	-	A	A	B	A	A	C	D	-	B	A	-	A	A	-	A	A	-	A	-	-	A	A	A							
Aluminum Sulfate	-	C	C	A	A	A	A	C	C	D	A	A	B	A	A	C	A	-	B	A	A	A	A	-	A	A	-	A	-	-	A	A	A							
Amines	A	A	A	-	A	B	A	B	-	A	B	C	A	A	B	D	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
Ammonia 10%	-	-	A	-	-	A	A	-	-	-	-	A	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	B						
Ammonia, Anhydrous	A	B	A	A	B	B	A	D	-	D	B	A	B	A	A	D	A	-	B	A	B	C	A	-	D	B	B	A	A	D	A	-	-	-						
Ammonia, Liquids	-	A	A	A	D	-	B	D	-	A	A	B	A	A	D	-	-	D	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Ammonia, Nitrate	-	A	A	A	C	-	-	D	-	-	A	B	B	-	A	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Ammonium Bifluoride	-	C	A	-	D	-	B	-	-	-	-	A	-	-	A	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Ammonium Carbonate	B	A	A	A	C	A	B	B	-	C	B	A	B	A	A	D	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Ammonium Casenite	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Ammonium Chloride	C	A	C	A	C	A	A	D	C	D	D	A	B	A	A	B	A	-	B	A	A	A	A	-	A	A	C	A	A	A	A	A	A	A	A	A				
Ammonium Hydroxide	A	A	A	A	C	A	A	D	D	A	C	A	B	A	A	D	A	B	B	A	A	A	A	-	B	B	B	A	A	C	A	-	-	-	-	-				
Ammonium Nitrate	A	A	A	A	B	A	A	D	D	A	D	A	B	A	A	C	D	-	B	A	A	A	A	-	A	A	C	A	A	A	A	A	A	A	A	A				
Ammonium Oxalate	-	A	A	A	-	-	A	-	-	-	-	A	-	-	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Ammonium Persulfate	-	A	A	A	C	A	A	A	-	D	A	A	-	-	A	A	D	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Ammonium Phosphate, Dibasic	B	A	A	A	B	A	A	C	-	-	D	A	-	-	A	A	B	A	-	B	A	-	B	A	-	A	A	A	A	B	A	A	A	A	A	A	A			
Ammonium Phosphate, Monobasic	-	A	A	A	B	A	A	D	-	-	A	A	A	A	B	A	-	B	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Ammonium Phosphate, Tribasic	B	A	A	A	B	A	A	C	-	C	D	A	-	-	A	A	B	A	-	B	A	-	A	A	-	A	A	B	A	A	A	A	A	A	A	A	A			
Ammonium Sulfate	C	A	B	A	B	A	A	B	C	C	C	A	D	A	A	B	D	-	B	A	A	A	A	-	D	A	B	A	A	A	A	A	A	A	A	A	A			
Ammonium Thio-Sulfate	-	-	A	-	-	A	-	-	-	D	A	-	-	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Amyl-Acetate	B	A	A	C	B	A	A	C	-	-	C	D	D	A	D	A	B	-	D	D	A	A	A	-	D	D	D	D	A	D	A	-	-	-	-	-	-			
Amyl Alcohol	-	A	A	-	B	A	A	A	-	-	A	B	A	C	A	A	-	B	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Amyl Chloride	-	C	B	-	D	-	A	A	-	-	A	D	C	A	D	A	C	-	D	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Aniline	B	A	A	A	C	C	B	C	-	-	C	D	D	A	D	D	C	D	C	B	A	A	A	-	D	D	C	D	B	D	A	-	-	-	-	-	-			
Anti-Freeze	-	A	A	-	A	-	A	B	B	B	C	A	B	A	A	A	A	B	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Antimony Trichloride	-	D	D	-	D	-	A	-	-	-	-	A	A	A	-	-	D	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Aqua Regia (80%, HCl, 20%, HNO)	-	D	D	-	D	A	D	D	-	-	D	D	A	D	D	D	-	D	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Arochlor 1248	-	-	-	-	-	-	-	-	-	-	A	-	-	-	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Aromatic Hydrocarbons	-	-	A	-	A	-	-	A	-	-	A	A	D	-	-	D	A	-	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Arsenic Acid	B	A	A	-	D	-	-	D	B	D	D	A	B	A	A	D	A	-	B	A	-	A	A	-	A	A	-	A	-	-	-	-	-	-	-	-	-	-	-	
Asphalt	-	B	A	-	C	-	-	A	-	C	-	A	-	-	-	A	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Barium Carbonate	B	A	A	A	B	A	A	B	-	B	B	A	A	A	A	A	A	-	B	A	-	A	A	A	A	-	A	-	-	-	-	-	-	-	-	-	-	-	-	
Barium Chloride	C	A	A	A	D	A	A	B	-	N	C	A	B	A	A	A	B	-	B	A	A	A	A	-	A	A	A	A	A	B	A	A	A	A	A	A	A	A	A	
Barium Cyanide	-	-	A	-	-	-	-	C	-	-	-	A	-	-	-	B	-	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Barium Hydroxide	B	C	A	A	D	B	B	B	-	C	C	A	-	-	A	A	D	A	-	B	A	A	A	A	A	A	A	C	A	A	A	A	A	A	A	A	A	A	A	
Barium Nitrate	-	A	A	-	-	A	-	D	-	A	A	B	-	-	-	A	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium Sulfate	B	A	A	A	D	A	A	C	-	C	C	A	-	-	A	A	A	A	-	B	A	A	A	B	-	A	A	D	A	A	-	-	-	-	-	-	-	-	-	-
Barium Sulfide	B	A	A	-	D	-	-	C	-	C	C	A	A	A	A	A	A	-	B	A	-	A	A	-	A	A	C	A	A	A	A	A	A	A	A	A	A	A	A	A
Beer*	A	A	A	-	A	A	A	A	B	D	D	A	-	-	A	A	B	D	B	B	D	-	A	A	-	A	D	C	A	A	A	A	A	A	A	A	A	A	A	A

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Beet Sugar Liquids	A	A	A	-	A	-	-	A	B	A	-	A	-	A	A	B	A	B	-	A	-	A	A	-	A	A	-	B	A	A	A				
Benzaldehyde ¹	A	A	A	-	B	A	A	A	-	B	A	D	D	A	D	A	C	D	D	D	A	A	A	-	D	D	B	D	A	D	A				
Benzene ²	B	A	A	A	B	A	B	B	A	B	C	D	C	A	D	A	A	D	D	D	A	A	A	A	D	-	D	D	D	A					
Benzoic Acid ³	B	A	A	A	B	A	A	B	-	D	-	A	B	A	A	B	D	-	B	D	-	A	B	-	A	D	-	D	D	D	A				
Benzol	-	A	A	-	B	A	A	B	A	-	-	D	-	A	D	A	A	-	-	A	A	A	A	A	D	D	-	D	-	-	A				
Borax (Sodium Borate)	-	A	A	A	C	-	A	A	B	A	C	A	A	A	A	A	A	-	B	A	A	A	A	A	A	B	C	A	A	C	A				
Boric Acid	B	A	A	A	B	A	A	B	C	D	-	A	B	A	A	A	A	-	B	A	-	A	A	A	A	A	-	A	A	A	A				
Brewery Slop	-	-	A	-	-	-	-	A	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A				
Bromine ² (wet)	D	D	D	D	D	A	A	C	-	D	D	B	B	A	D	D	D	D	D	D	D	D	A	D	A	D	D	D	D	D	C				
Butadiene	A	A	A	-	A	-	-	C	A	C	C	A	-	A	-	A	A	-	-	B	A	A	-	A	A	-	B	A	-	A	A				
Butane ¹	A	A	A	-	A	-	-	A	A	C	C	A	C	A	D	A	A	B	C	D	A	A	-	A	A	-	A	D	B	D	D	A			
Butanol	-	A	A	-	A	-	-	A	A	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Butter	-	B	A	-	A	-	-	D	-	D	-	-	B	-	B	A	-	B	-	-	-	-	-	-	-	A	A	-	B	A	D	A			
Buttermilk	A	A	A	A	A	-	-	D	-	D	-	-	B	A	A	A	A	B	-	-	-	-	-	-	-	-	A	A	-	A	-	D	A		
Butylene	A	-	A	-	A	-	-	A	A	A	B	-	A	-	A	-	-	-	-	-	-	-	-	-	-	-	A	A	-	A	B	-	D	D	A
Butyl Acetate ¹	-	-	C	-	A	-	A	A	-	-	A	D	D	A	D	A	-	-	C	D	A	A	A	-	D	B	D	D	B	D	A				
Butyric Acid ¹	B	B	A	A	B	A	A	C	-	D	-	B	-	A	A	C	D	D	-	A	-	A	D	-	A	D	-	D	B	-	A				
Calcium Bisulfate	C	D	A	-	D	-	-	D	D	D	-	A	A	A	-	-	-	-	-	-	-	-	-	-	-	-	-	A	C	C	-	A	A		
Calcium Bisulfide	-	-	B	-	C	A	A	C	-	-	-	A	-	A	A	D	A	-	B	A	-	A	A	-	A	A	-	A	D	-	A	A			
Calcium Bisulfite	-	D	A	-	C	A	A	C	-	-	-	A	-	A	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Calcium Carbonate	B	A	A	A	C	A	A	C	-	D	-	A	A	A	A	A	A	-	B	A	-	A	A	-	A	A	-	A	-	A	-	A	A		
Calcium Chlorate	-	C	A	-	-	B	C	-	-	-	-	A	A	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Calcium Chloride	C	A	D	C	C	A	A	B	-	C	-	A	A	A	A	D	A	B	B	A	A	A	A	B	A	A	B	D	A	A	A	A			
Calcium Hydroxide	B	A	A	-	C	A	A	B	-	-	-	A	A	A	A	B	A	-	B	A	-	B	A	-	A	A	A	C	A	A	A	A			
Calcium Hypochlorite	D	A	C	C	C	A	B	D	-	D	-	-	A	A	D	D	-	B	A	-	A	A	-	A	B	C	D	A	C	A	A				
Calcium Sulfate	B	A	A	A	B	A	B	B	-	-	-	A	A	A	A	A	C	B	A	A	A	A	-	A	A	-	A	-	D	-	C	A			
Calgon	-	A	A	-	-	-	-	C	-	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Cane Juice ⁴	-	A	A	-	B	-	-	B	C	A	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Carbolic Acid (See Phenol)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Carbon Bisulfide ⁵	B	A	A	A	A	-	-	C	-	B	-	D	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Carbon Dioxide (Wet)	-	A	A	-	C	-	-	A	C	C	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Carbon Disulfide ³	-	B	A	-	C	-	-	C	C	B	C	D	C	A	D	A	A	-	D	D	A	A	B	-	A	D	-	D	D	D	A				
Carbon Monoxide	-	A	A	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Carbon Tetrachloride ¹	B	C	B	A	C	A	A	C	A	C	D	C	C	A	D	A	A	D	D	D	C	A	A	A	C	C	D	-	D	C	A				
Carbonated Water	B	A	A	A	A	-	-	B	-	D	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Carbonic Acid	B	A	B	A	A	-	A	B	-	D	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Catsup	-	A	A	A	D	-	-	C	-	D	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Chloroacetic Acid ²	D	D	D	D	C	A	A	D	-	D	-	A	D	A	-	D	D	-	D	D	-	-	-	-	-	-	-	-	-	-	-	-	-		
Chloric Acid	-	D	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Chlorinated Glue	-	A	A	-	D	-	-	C	-	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Chlorine, Anhydrous Liquid	-	D	D	D	D	D	A	D	-	C	-	D	B	A	A	D	D	-	D	D	C	A	D	-	A	D	-	D	B	D	B	B			
Chlorine (Dry)	B	A	A	-	D	D	A	A	B	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Chlorine Water	D	-	D	-	D	A	B	D	D	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Chlorobenzene (Mono)	A	A	A	-	B	-	A	B	-	B	C	D	D	A	D	A	A	D	D	D	A	A	-	A	D	-	D	D	D	A	A	A			

A—No effect—Acceptable
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1. P.V.C.—Satisfactory to 72° F.
 2. Polypropylene—Satisfactory to 72° F.
 3. Polypropylene—Satisfactory to 120° F.
 4. Buna-N—Satisfactory for "O" Rings
 5. Polyacetal—Satisfactory to 72° F.
 6. Ceramag—Satisfactory to 72° F.

	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Aluminum	TITANIUM	HASTELLOY C	Cast Bronze	Brass	Cast Iron	Carbon Steel	PVC (Type 1)	Tygon (E-3606)	Teflon	Noryl	Polyacetal	Nylon	Cyclocac (ABS)	Polyethylene	POLYPROPYLENE	RYTON	CARBON	CERAMIC	CERAMAGNET "A"	VITON	BUNA N (NITRILE)	Silicon	Neoprene	Ethylene Propylene (EPM)	Rubber (Natural)	Epoxy	
Chloroform	A	A	A	A	D	A	A	B	-	D	C	D	C	A	D	A	C	D	D	D	C	A	A	A	A	D	D	D	D	D	A	
Chlorosulfonic Acid ¹	D	D	-	D	D	A	B	D	-	-	D	C	C	A	D	D	D	-	D	D	D	-	C	-	D	D	D	D	D	D	C	
Chlorox (Bleach)	-	A	A	-	C	-	A	A	-	D	C	A	B	A	A	D	D	B	-	D	C	A	A	-	A	C	-	B	B	D	A	
Chocolate Syrup	-	A	A	-	A	-	-	-	-	D	-	-	-	A	A	A	-	-	A	-	A	-	A	-	A	A	-	A	-	D	A	
Chromic Acid 5%	-	A	A	B	C	A	A	D	D	-	A	B	-	C	D	D	B	B	A	A	D	C	-	A	D	C	D	A	B	B		
Chromic Acid 10%	-	B	-	-	A	A	-	D	-	-	A	-	A	A	-	D	-	-	A	-	A	-	A	-	A	D	-	D	-	C		
Chromic Acid 30%	-	B	-	-	A	A	-	D	-	-	A	-	A	D	-	D	-	-	A	-	A	-	A	-	A	D	-	D	-	D		
Chromic Acid 50%	C	B	B	-	C	A	A	D	D	D	-	B	B	A	D	D	D	C	C	B	B	D	A	-	A	D	-	D	A	D	C	
Cider	-	A	A	A	B	-	-	A	-	D	-	A	-	-	A	B	-	-	B	-	-	A	A	-	A	A	-	A	-	-	A	
Citric Acid	-	A	A	A	C	A	A	D	C	D	-	A	-	A	A	B	C	C	B	B	-	A	A	B	A	D	C	A	A	A	A	
Citric Oils	-	A	A	-	C	-	-	B	-	-	-	-	-	A	B	-	-	-	A	-	A	A	-	A	A	-	A	A	C	D	-	A
Coffee	A	A	A	A	-	-	B	-	C	-	-	-	-	A	A	A	A	-	-	A	A	A	-	A	A	-	A	A	-	A	A	
Copper Chloride	C	D	D	B	D	A	A	D	-	D	-	A	B	A	A	B	D	-	B	A	A	-	A	-	A	-	A	A	-	A	A	
Copper Cyanide	-	A	A	A	D	A	A	C	-	D	-	A	-	A	A	B	A	-	B	A	A	A	-	B	B	-	A	A	A	C		
Copper Fluoride	-	D	D	-	D	-	B	D	-	D	-	A	-	A	-	B	-	-	A	-	-	A	-	-	A	B	-	A	-	A		
Copper Nitrate	B	A	A	B	D	A	A	D	-	-	-	A	-	A	A	B	D	-	B	A	-	A	A	-	A	A	-	A	-	-	A	
Copper Sulfate (5% Solution)	-	A	A	A	D	A	A	D	D	-	A	-	A	A	B	D	-	B	A	A	A	-	A	A	-	A	A	C	A	-	C	
Copper Sulfate	B	B	-	-	A	A	C	D	-	-	A	-	A	A	-	C	-	-	A	-	-	A	-	A	-	B	B	-	A	-	A	
Cream	-	A	A	-	A	-	C	-	D	-	-	-	-	A	A	A	-	-	A	-	A	-	A	-	A	A	-	C	-	-	A	
...ols ²	-	A	A	-	B	-	-	D	C	-	-	D	D	-	-	D	-	D	D	C	A	A	-	A	D	D	D	D	D	A		
...lic Acid	B	A	A	-	C	A	B	C	-	-	B	D	A	-	D	D	-	C	-	-	A	A	-	A	D	-	D	D	D	A		
Cyclohexane	-	A	-	-	A	A	-	A	-	-	A	-	D	-	D	A	-	-	D	A	A	A	-	A	A	-	A	D	D	D	A	
Cyanic Acid	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	D	-	-	-	-	-	-	-	-	-	C	-	D	-	-	A	
Detergents	-	A	A	-	A	-	-	A	-	-	A	A	-	-	A	B	A	B	B	A	A	A	-	A	A	-	A	A	-	B	A	C
Dichloroethane	-	A	A	-	-	A	-	-	-	-	D	D	A	-	-	A	-	D	-	-	-	-	-	-	-	C	-	D	-	D	A	
Diesel Fuel	A	A	A	-	A	-	-	A	-	A	A	-	-	D	A	-	-	-	D	A	A	A	-	A	A	-	A	-	D	D	D	A
Diethylamine	A	A	-	-	A	-	-	A	-	-	-	D	-	A	B	D	-	-	C	-	A	A	-	D	B	-	B	B	C	A		
Diethylene Glycol	-	A	-	-	-	A	-	-	-	-	-	-	-	A	A	A	B	B	-	-	A	A	-	A	A	-	A	A	C	A	A	A
Diphenyl Oxide	-	A	-	-	-	A	-	-	-	-	-	-	-	A	-	-	-	-	-	-	A	A	-	A	D	-	D	D	D	A		
Dyes	-	A	A	-	B	-	-	C	-	-	-	-	-	A	A	-	-	-	-	-	-	-	-	-	-	-	-	C	-	-	A	
Epsom Salts (Magnesium Sulfate)	B	A	A	A	A	A	B	B	-	-	-	A	-	-	A	A	-	-	A	-	A	-	A	-	A	-	A	-	A	-	C	A
Ethane	A	A	-	-	A	-	-	A	-	-	-	-	-	D	A	-	-	-	-	-	A	A	-	A	A	-	A	-	B	D	D	A
Ethanolamine	-	A	A	-	-	-	-	-	-	C	-	-	-	-	D	-	-	-	-	-	A	A	A	-	D	B	C	B	-	C	A	
Ether ³	A	A	A	A	A	-	B	B	A	-	B	D	C	-	D	A	C	-	-	-	A	A	A	C	D	-	D	C	D	A		
Ethyl Acetate ²	-	A	A	-	B	-	B	B	-	-	C	D	D	A	D	A	A	D	C	C	A	A	A	-	D	D	C	D	B	D	A	
Ethyl Chloride	-	A	A	A	B	A	B	B	-	C	D	D	D	A	D	A	A	-	D	D	A	A	-	A	D	D	C	A	A	A	A	
Ethyl Sulfate	-	D	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	-	-	-	-	-	-	-	-	A	A	-	-	-	A	
Ethylene Chloride ²	-	A	A	-	C	B	B	A	-	C	C	D	-	A	D	A	-	D	-	D	A	A	-	A	D	D	D	C	D	A		
Ethylene Dichloride	-	A	A	-	D	A	B	C	-	-	C	D	D	A	D	A	A	-	D	A	A	C	A	-	A	D	D	D	C	D	A	
Ethylene Glycol ⁴	-	A	A	-	A	-	A	B	B	B	C	A	B	A	A	A	A	B	B	A	A	A	A	A	A	A	A	C	A	A	A	A
Ethylene Oxide	-	-	A	-	A	-	-	A	-	-	-	D	-	A	A	A	A	-	-	-	-	A	A	-	D	D	D	C	D	A		
Fatty Acids	-	A	A	-	B	A	A	C	-	D	-	A	B	A	B	A	A	-	B	A	-	A	A	-	A	C	C	B	C	C	A	
Ferric Chloride	-	D	D	D	D	A	B	D	D	-	-	A	B	A	A	B	D	-	B	A	A	A	A	-	A	D	C	B	A	A	A	
Ferric Nitrate	-	A	A	A	D	A	A	D	-	-	-	A	-	A	A	B	D	-	B	A	A	A	A	-	A	D	A	A	A	A	A	
Ferric Sulfate	-	A	C	A	D	A	A	D	D	-	-	A	B	A	A	B	A	C	-	A	A	C	A	-	A	B	C	A	-	A	A	
...ous Chloride	-	D	D	-	D	A	B	C	-	D	-	A	B	A	A	B	D	-	B	A	A	A	A	-	A	B	C	A	-	A	A	

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	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Aluminum	TITANIUM	HASTELLOY C	Cast Bronze	Brass	Cast Iron	Carbon Steel	PVC (Type 1)	Tygon (E-3606)	Teflon	Noryl	Polyacetal	Nylon	Cycloc (ABS)	Polyethylene	POLYPROPYLENE	RYTON	CARBON	CERAMIC	CERAMAGNET "A"	VITON	BUNA N (NITRILE)	Silicon	Neoprene	Ethylene Propylene (EPM)	Rubber (Natural)	Epoxy			
Ferrous Sulfate	B	A	C	-	D	A	B	C	-	D	D	A	B	A	A	B	D	-	B	A	A	A	A	-	A	B	-	A	-	A	A			
Fluoboric Acid	-	D	B	-	-	D	A	-	-	D	-	A	B	A	B	B	C	-	B	A	-	A	D	-	A	B	-	A	-	-	A			
Fluorine	D	D	D	-	D	D	A	D	-	D	D	C	-	C	-	-	D	-	C	-	-	D	-	-	-	-	-	-	-	-	D			
Fluosillicic Acid	-	-	B	-	D	D	B	-	-	D	-	A	B	A	A	B	D	-	B	A	-	A	D	-	B	A	-	A	-	-	C			
Formaldehyde 40%	-	-	A	-	-	A	A	-	-	-	B	-	A	A	-	D	-	-	A	A	-	A	-	A	-	D	B	B	A	-	A			
Formaldehyde	A	A	A	-	A	A	B	A	B	D	A	B	A	D	A	A	-	B	A	A	A	A	-	A	C	B	D	B	C	A				
Formic Acid*	C	A	B	B	D	C	A	C	C	D	D	D	B	A	A	D	D	-	B	A	A	A	A	B	B	D	C	D	A	C	B			
Freon 11 ¹	A	-	A	-	B	-	-	B	-	C	B	D	A	D	A	A	D	C	-	A	A	A	A	C	C	D	D	D	D	A				
Freon 12 (wet) ²	-	-	D	-	B	-	-	B	-	-	-	B	D	A	D	A	A	B	C	A	A	A	A	A	A	D	B	B	D	A				
Freon 22	-	-	A	-	B	-	-	B	-	-	-	D	D	-	B	A	A	-	-	-	A	A	A	A	D	D	D	A	A	A	A			
Freon 113	-	-	A	-	B	-	-	B	-	-	-	C	D	-	-	A	A	-	-	-	A	A	A	C	A	D	A	-	D	A				
Freon T.F.*	-	-	A	-	B	-	-	B	-	-	-	B	D	-	D	A	A	-	-	D	A	A	A	B	A	D	A	D	D	A				
Fruit Juice	A	A	A	A	B	-	-	B	-	D	D	A	-	D	A	B	A	-	B	A	-	B	A	A	A	A	A	A	-	-	A			
Fuel Oils	A	A	A	-	A	A	B	-	C	B	A	-	A	A	A	A	-	D	B	A	A	A	-	A	A	C	B	D	D	A				
Furan Resin	-	A	A	-	A	-	-	A	-	A	A	-	-	A	-	A	-	-	-	A	-	A	-	A	D	-	D	-	D	A				
Furfural ³	A	A	A	-	A	-	B	A	-	-	A	D	-	A	D	B	A	D	D	D	A	A	A	-	D	D	D	B	D	A				
Gallic Acid	B	A	A	-	A	-	A	A	-	D	D	A	A	A	-	-	A	-	-	-	-	-	-	-	B	A	-	-	-	-				
Gasoline ⁴	A	A	A	A	A	D	A	A	-	A	C	-	A	D	A	A	D	D	C	A	A	A	A	A	A	D	D	C	D	A				
Gelatin	A	A	A	A	A	-	A	A	C	D	D	A	-	A	A	A	-	-	A	-	A	A	-	A	-	A	-	A	-	A	A			
Glucose	A	-	A	-	A	-	-	A	A	B	B	A	B	A	B	A	A	B	B	A	-	A	A	-	A	B	A	A	A	A	A			
Glycol P.V.A. ⁵	B	B	A	-	B	A	-	A	-	-	A	A	B	A	-	A	A	-	-	-	A	A	-	A	A	-	A	-	-	A				
Glycerine	A	A	A	A	A	A	A	B	B	B	A	B	A	A	A	A	C	-	A	-	A	A	-	A	B	A	A	A	A	A				
Cycloic Acid	-	-	-	-	-	A	-	-	-	-	A	-	A	C	-	-	B	A	A	A	-	-	A	A	-	A	-	-	-	A				
Gold Monocyanide	-	-	A	-	-	-	A	-	D	-	-	-	-	A	-	-	-	-	-	-	A	A	-	A	A	-	A	-	-	A				
Grape Juice	-	A	A	-	B	-	-	B	-	D	-	A	-	-	A	B	-	B	B	-	-	A	A	-	A	A	-	A	-	-	A			
Grease ⁶	A	A	A	-	A	-	-	B	-	A	A	-	-	A	-	A	A	-	-	-	A	A	-	-	A	A	-	D	-	-	A			
Heptane ¹	A	-	A	-	A	-	A	A	-	-	B	A	-	A	D	A	A	C	D	D	A	A	A	-	A	A	-	B	D	-	A			
Hexane ¹	A	A	A	-	A	-	A	B	-	-	B	C	-	A	D	A	A	D	-	C	A	A	A	-	A	B	B	D	D	A				
Honey	-	A	A	-	A	-	-	A	-	A	-	-	A	A	A	B	-	A	-	A	A	-	A	A	-	A	A	-	A	-	A			
Hydraulic Oils (Petroleum) ¹	A	A	A	-	A	-	-	B	-	A	A	-	-	A	-	A	A	-	-	D	-	A	A	-	A	A	-	B	D	D	A			
Hydraulic Oils (Synthetic) ¹	-	A	A	-	-	-	A	-	-	-	-	-	-	A	A	-	-	-	-	D	-	A	A	-	A	C	D	-	-	A				
Hydrazine	-	A	A	-	-	-	-	C	-	-	-	-	-	D	-	-	-	-	-	-	-	-	-	-	A	B	D	B	A	C	A			
Hydrobromic Acid 20%	-	-	D	-	-	A	A	-	-	-	-	A	-	A	A	-	D	-	-	A	-	-	B	-	A	D	-	C	-	-	B			
Hydrobromic Acid*	D	D	D	D	D	A	A	D	-	D	D	A	B	A	C	D	D	-	B	B	-	A	A	-	A	D	D	D	A	A	A			
Hydrochloric Acid (Dry Gas)	D	C	A	-	D	-	A	-	-	-	D	A	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	A		
Hydrochloric Acid (20%) ⁴	-	D	D	D	D	C	B	D	-	D	-	A	B	A	A	D	D	B	A	A	D	A	A	D	A	C	-	C	A	C	A			
Hydrochloric Acid (37%) ⁴	-	D	D	D	D	C	B	D	-	D	-	A	B	A	A	D	D	C	A	A	D	A	C	D	A	C	C	C	D	A				
Hydrochloric Acid 100%	-	D	D	-	D	D	C	D	-	D	-	A	A	A	-	-	D	-	A	-	-	A	C	-	C	D	-	C	-	-	A	A		
Hydrocyanic Acid	A	A	A	C	A	A	A	D	D	-	C	A	B	A	B	A	-	B	A	-	A	A	-	A	C	-	B	-	A	A	A			
Hydrocyanic Acid (Gas 10%)	-	D	D	-	-	-	-	-	-	-	-	A	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	C	A	C	A
Hydrofluoric Acid (20%) ¹	-	D	D	D	D	D	B	D	-	D	-	D	B	A	A	D	D	-	C	A	C	B	C	D	A	D	-	C	A	C	B			
Hydrofluoric Acid (75%) ^{1 2}	-	C	D	-	D	D	C	D	-	D	-	C	B	A	D	D	D	-	C	B	C	D	D	D	A	D	D	D	C	C	C			
Hydrofluoric Acid 100%	D	D	D	-	D	D	B	D	-	D	D	C	D	A	-	-	-	-	D	-	C	D	D	-	-	D	-	D	-	D	-	D	A	
Hydrofluosillicic Acid (20%)	-	D	D	-	D	D	B	A	-	D	-	D	-	A	B	D	D	-	-	A	-	A	D	-	A	B	-	B	A	A	C			
Hydrofluosillicic Acid	-	D	D	-	C	-	C	D	-	-	-	-	C	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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1. P.V.C.—Satisfactory to 72° F.
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	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Aluminum	TITANIUM	HASTELLOY C	Cast Bronze	Brass	Cast Iron	Carbon Steel	PVC (Type 1)	Tygon (E-3605)	Teflon	Noryl	Polyacetal	Nylon	Cycloac (ABS)	Polyethylene	POLYPROPYLENE	RYTON	CARBON	CERAMIC	CERAMAGNET "A"	VITON	BUNA N (NITRILE)	Silicon	Neoprene	Ethylene Propylene (EPM)	Rubber (Natural)	Epoxy							
Hydrogen Gas	A	A	A	-	A	-	-	A	-	B	B	A	-	A	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-							
Hydrogen Peroxide 10%	-	C	C	-	A	C	A	D	D	D	D	-	A	A	A	-	D	-	A	-	B	A	A	-	-	A	-	D	-	C	D							
Hydrogen Peroxide 30%	-	-	B	-	-	B	A	-	D	-	-	-	A	-	A	-	D	-	-	A	C	-	-	-	-	A	D	-	C	-	-	B						
Hydrogen Peroxide	-	A	B	A	A	B	A	D	D	D	D	D	A	C	A	B	D	D	-	B	A	C	-	-	A	A	D	C	D	C	C	A						
Hydrogen Sulfide, Aqueous Solution	-	A	A	C	C	A	A	D	C	D	-	A	B	A	A	D	D	-	B	A	A	A	A	B	C	-	B	A	D	A	D	A						
Hydrogen Sulfide (Dry)	A	C	A	-	D	-	A	D	C	B	B	A	-	A	-	-	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A					
Hydroxyacetic Acid (70%)	-	-	-	-	D	B	-	-	-	-	-	-	A	-	-	-	D	-	-	-	-	-	-	-	A	A	-	A	A	-	A	-	A					
Ink	A	A	A	-	C	-	-	C	-	D	D	-	-	B	A	A	-	B	-	-	A	A	A	A	-	A	-	A	-	-	-	-	-	A				
Iodine	-	D	D	D	D	A	B	D	-	D	-	D	B	A	A	C	D	D	D	D	-	D	A	-	A	B	-	D	B	D	A	D	A					
Iodine (In Alcohol)	-	-	B	-	-	D	A	-	-	-	-	D	-	A	C	-	D	-	-	B	-	-	-	-	A	-	A	D	-	D	-	-	-					
Iodoform	B	D	A	-	A	-	-	C	-	C	B	-	-	A	-	-	A	-	-	-	-	-	-	-	-	-	C	-	-	-	-	-	-					
Isotane ¹	-	-	-	-	A	-	-	-	-	-	-	-	-	D	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Isopropyl Acetate	-	-	B	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Isopropyl Ether ²	A	-	A	-	A	-	-	A	-	-	-	-	A	D	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Jet Fuel (JP3, JP4, JP5)	A	A	A	-	A	-	-	A	-	-	-	-	A	D	A	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Kerosene ²	A	A	A	A	A	A	A	A	A	A	A	B	A	D	A	A	B	D	D	A	A	A	A	A	A	A	D	D	A	D	A	D	A	D	A			
Ketones	A	A	A	-	B	A	A	A	-	A	A	D	D	A	D	B	A	-	D	D	A	C	A	-	D	D	-	D	D	C	C	C	C	C	C			
Lacquers	A	A	A	-	A	-	-	A	C	C	C	-	D	-	C	A	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Paint Thinner	-	-	A	-	-	A	A	-	C	-	-	C	-	A	D	-	A	-	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Perchloric Acid	A	A	B	C	C	A	A	D	-	D	D	A	B	A	A	B	C	-	B	A	A	A	A	-	B	B	-	A	B	A	A	A	A	A	A			
Lard	B	A	A	A	A	-	-	A	-	A	C	A	-	-	-	A	A	C	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Latex	-	A	A	-	A	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Lead Acetate	B	A	A	-	D	A	A	C	-	-	D	A	B	A	A	A	A	-	B	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Lead Sulfamate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Ligroin ³	-	-	A	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Lime	-	A	A	-	C	A	-	A	-	A	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Lubricants	-	A	A	-	A	A	A	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Magnesium Carbonate	-	A	A	A	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Magnesium Chloride	B	B	B	A	D	A	A	B	C	D	C	A	B	A	A	A	A	-	B	A	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Magnesium Hydroxide	A	A	A	-	D	A	A	C	B	B	B	A	-	A	A	A	A	-	B	A	A	A	A	-	A	B	-	B	-	C	A	C	A	C	A	C		
Magnesium Nitrate	-	A	A	A	-	A	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Magnesium Oxide	-	A	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Magnesium Sulfate	B	B	A	-	B	A	B	B	B	C	B	A	B	A	A	A	A	-	B	A	A	A	A	-	A	A	-	A	D	C	A	C	A	C	A	C		
Maleic Acid	C	A	A	A	B	A	A	C	-	-	B	A	B	A	A	C	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Maleic Anhydride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Malic Acid	B	A	A	-	C	-	A	D	-	-	D	A	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mash	-	A	A	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mayonnaise	A	A	A	-	D	-	-	D	-	D	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Melamine	-	D	D	-	-	-	-	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mercuric Chloride (Dilute Solution)	D	D	D	D	D	A	B	D	D	D	D	A	A	A	A	A	A	-	B	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mercuric Cyanide	A	A	A	-	D	A	-	D	-	-	D	A	-	A	A	A	-	-	B	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	A	A	A	A	C	C	A	D	D	A	A	A	-	A	A	A	A	-	B	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methanol (See Alcohol Methyl)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Acetate	A	-	A	-	A	A	-	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Methyl Methacrylate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

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	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Aluminum	TITANIUM	HASTELLOY C	Cast Bronze	Brass	Cast Iron	Carbon Steel	PVC (Type 1)	Tygon (E-3606)	Teflon	Noryl	Polyacetal	Nylon	Cyclac (ABS)	Polyethylene	POLYPROPYLENE	RYTON	CARBON	CERAMIC	CERAMAGNET "A"	VITON	BUNA N (NITRILE)	Silicon	Neoprene	Ethylene Propylene (EPM)	Rubber (Natural)	Epoxy
Methyl Acetone	A	A	A	A	A	A	A	A	A	A	A	A	A	A	D	A	A	A	A	A	A	A	A	D	D	D	D	D	D	D	
Methyl Alcohol 10%	A	A	C	C	A	C	C	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	
Methyl Bromide	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	D	B	A	A	A	A	A	A	A	B	D	D	D	D	B	
Methyl Butyl Ketone	A	A	A	A	A	A	A	A	A	A	A	A	A	A	D	B	A	A	A	A	A	A	A	D	D	C	D	A	D	B	
Methyl Cellosolve	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	C	B	A	A	A	A	A	A	D	D	C	D	A	D	C	
Methyl Chloride	C	A	D	A	A	A	A	A	A	D	A	A	A	A	D	D	A	A	A	A	A	A	A	A	D	D	D	C	D	A	
Methyl Dichloride	A	A	A	A	A	A	A	A	A	A	A	A	A	A	D	A	A	A	A	A	A	A	A	A	D	D	D	D	D	A	
Methyl Ethyl Ketone	A	A	A	A	A	A	A	A	A	D	A	D	B	A	D	D	A	A	A	A	A	A	A	D	D	C	D	A	D	B	
Methyl Isobutyl Ketone ²	A	A	A	A	A	A	A	A	A	D	A	D	B	A	D	C	A	A	A	A	A	A	A	D	D	C	D	C	D	B	
Methyl Isopropyl Ketone	A	A	A	A	A	A	A	A	A	D	B	A	A	A	A	A	A	A	A	A	A	A	A	D	D	B	D	B	D	B	
Methyl Methacrylate	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	D	D	D	D	D	D	A	
Methylamine	A	A	A	A	A	A	A	C	B	D	A	D	A	D	D	D	A	A	A	A	A	A	A	B	D	D	D	D	A	A	
Methylene Chloride	A	A	A	A	A	A	A	C	B	D	A	D	A	D	D	D	A	A	A	A	A	A	A	B	D	D	D	D	A	A	
Milk	A	A	A	A	A	A	A	C	C	D	D	A	A	A	A	B	B	A	A	A	A	A	A	A	A	A	A	A	A	A	
Molasses	A	A	A	A	A	A	A	B	A	A	A	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Mustard	A	A	A	A	B	B	C	B	A	A	B	B	A	B	A	A	A	A	A	A	A	A	A	B	C	C	C	C	A	A	
Naptha	A	A	A	A	A	A	B	B	A	C	A	D	A	A	C	D	A	A	A	A	A	A	A	A	B	D	D	D	D	A	
Naphthalene	B	A	B	B	A	A	A	C	B	A	D	A	A	A	D	D	B	A	A	A	A	A	A	C	D	D	D	D	D	A	
Nickel Chloride	A	B	D	A	A	D	D	A	B	A	A	B	A	B	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Nickel Sulfate	B	A	B	D	A	B	C	C	D	D	A	A	A	A	B	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	
Nitric Acid (10% Solution)	A	A	A	A	D	A	A	D	D	D	A	B	A	A	D	D	C	B	A	D	C	B	D	A	D	D	B	D	A	A	
Nitric Acid (20% Solution)	A	A	A	A	D	A	A	D	D	D	A	B	A	A	D	D	D	B	A	C	D	C	D	A	D	D	D	D	B	B	
Nitric Acid (50% Solution)	A	A	A	A	D	A	A	D	D	D	A	B	A	A	D	D	D	C	D	C	D	A	A	D	D	D	D	D	D	D	
Nitric Acid (Concentrated Solution)	D	B	A	B	A	B	D	D	D	D	C	A	D	D	D	D	D	D	C	D	A	C	B	D	D	D	D	D	D	D	
Nitrobenzene ²	B	A	B	C	A	B	D	B	B	D	D	A	D	B	C	D	D	C	B	A	A	A	D	D	D	D	D	D	B	B	
Oils																															
Aniline	A	A	C	A	D	A	A	A	D	A	D	D	C	D	A	A	A	A	A	A	A	A	A	D	D	B	D	A	A	A	
Anise	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Bay	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Bone	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Castor	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Cinnamon	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Citric	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Clove	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Coconut	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Cod Liver	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Corn	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Cotton Seed	B	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Cresote ²	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Diesel Fuel (2D, 3D, 4D, 5D)	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Fuel (1, 2, 3, 5A, 5B, 6)	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	

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	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Aluminum	TITANIUM	HASTELLOY C	Cast Bronze	Brass	Cast Iron	Carbon Steel	PVC (Type 1)	Tygon (E-3606)	Teflon	Noryl	Polyacetal	Nylon	Cyclac (ABS)	Polyethylene	POLYPROPYLENE	RYTON	CARBON	CERAMIC	CERAMAGNET "A"	VITON	BUNA N (NITRILE)	Silicon	Neoprene	Ethylene Propylene (EPM)	Rubber (Natural)	Epoxy	
Oils (Cont.)																																
Ginger	-	A	A	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	A	A	-	A	A	-	A	-	A		
Hydraulic (See Hydraulic)	-	A	A	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	A	A	-	A	A	-	A	-	A		
Lemon	-	A	A	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	D	-	A	A	-	A	A	-	D	-	A		
Linseed	-	A	A	A	A	-	A	-	A	-	A	B	-	A	A	C	-	A	-	A	-	A	A	A	A	A	-	D	D	D	A	
Mineral	A	A	A	A	A	-	-	A	-	A	B	A	-	B	A	A	-	-	B	A	A	A	A	A	A	A	-	B	D	D	A	
Olive	A	A	A	-	A	-	B	-	A	B	A	-	A	-	A	A	-	-	A	-	A	-	A	A	A	A	-	A	C	B	D	A
Orange	-	A	A	-	-	-	-	-	-	-	-	-	-	A	-	A	-	-	A	-	A	-	A	A	-	A	A	-	D	-	A	
Palm	-	A	A	-	A	-	B	-	-	-	-	-	-	A	-	A	-	-	-	-	-	A	A	-	A	A	-	D	-	A		
Peanut ¹	-	A	A	-	A	-	A	-	A	-	A	-	-	A	-	-	-	-	D	-	A	A	-	A	A	-	D	-	D	A		
Peppermint ¹	-	A	A	-	-	-	A	-	-	-	-	-	-	A	-	-	-	-	D	-	A	A	-	A	D	-	D	-	-	A		
Pine	A	A	A	-	A	-	D	-	C	B	A	-	A	-	A	-	-	-	-	-	-	A	A	-	A	A	-	D	-	D	A	
Rape Seed	-	A	A	-	-	-	A	-	-	-	-	-	-	A	-	-	-	-	-	-	-	A	A	-	A	B	-	D	-	D	A	
Rosin	-	A	A	-	A	-	-	-	-	-	-	-	-	-	A	A	-	-	A	-	A	-	A	A	-	A	A	-	-	-	A	
Sesame Seed	-	A	A	-	A	-	A	-	A	-	A	-	-	-	A	-	-	-	-	-	-	A	A	-	A	A	-	D	-	-	A	
Silicone	-	A	A	-	-	-	A	-	A	-	-	-	-	A	A	-	-	-	A	-	A	-	A	A	A	A	-	A	-	-	A	
Soybean	-	A	A	-	A	-	B	-	A	-	A	-	-	A	-	-	-	-	A	-	A	-	A	A	-	A	A	-	D	-	D	A
Sperm	-	A	A	-	-	-	A	-	-	-	A	-	-	A	-	-	-	-	-	-	-	A	A	-	A	A	-	D	-	-	A	
Tanning	-	A	A	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	A	A	-	A	A	-	D	-	-	A	
Turbine	-	A	A	-	A	-	A	-	A	-	A	-	-	A	-	C	-	-	-	-	-	A	A	-	A	A	-	D	-	D	A	
Acetic Acid	B	A	A	B	B	-	B	B	C	C	C	C	C	C	B	A	B	D	C	-	A	A	-	B	B	D	D	D	D	D	A	
in 25%	-	-	-	-	-	-	A	-	-	-	-	-	D	-	A	D	-	-	-	-	-	-	A	-	A	D	D	D	D	-	D	
Oleum	B	-	A	-	B	-	C	-	C	-	B	D	-	A	-	D	-	-	-	D	-	-	A	-	A	C	D	D	D	D	A	
Oxalic Acid (cold)	C	A	B	A	C	C	B	B	C	D	D	A	B	A	C	C	D	-	A	A	-	A	A	-	A	B	C	B	A	C	A	
Paraffin	A	A	A	A	A	-	A	-	B	B	A	-	B	B	A	A	B	-	A	-	A	-	A	A	-	A	A	-	-	-	-	A
Pentane	A	C	C	-	A	-	B	A	-	B	B	-	A	D	A	A	D	-	-	-	-	A	A	-	A	A	-	B	D	D	A	
Perchloroethylene ²	B	A	A	-	A	-	C	-	B	B	-	A	D	A	-	D	-	-	D	A	A	A	-	A	C	D	D	D	D	D	A	
Petrolatum	A	-	A	-	B	-	B	-	C	C	-	-	A	D	A	A	B	-	-	-	-	A	A	-	A	A	-	B	A	D	A	
Phenol 10%	B	A	A	-	A	-	B	C	-	B	D	A	C	A	-	-	-	-	D	-	-	-	A	-	-	B	D	-	C	D	C	B
Phenol (Carbolic Acid)	B	A	A	A	B	C	A	B	D	D	A	C	A	C	A	C	D	D	-	D	B	A	A	D	A	A	D	-	D	D	D	B
Phosphoric Acid (to 40% Solution)	-	B	A	A	D	A	A	D	D	D	-	A	B	A	A	D	D	C	B	A	A	B	C	D	A	D	-	D	B	C	A	
Phosphoric Acid (40%-100% Solution)	-	C	B	B	D	B	A	D	D	D	-	A	B	A	A	D	D	D	C	A	A	B	D	D	A	D	-	D	B	C	C	
Phosphoric Acid (Crude)	-	D	C	C	D	C	A	D	D	D	D	-	-	A	-	D	D	D	C	-	A	C	D	-	A	D	-	D	B	-	A	
Phosphoric Anhydride (Dry or Moist)	-	A	A	-	-	-	-	D	-	-	D	D	A	-	-	-	-	-	-	-	-	-	A	-	D	D	-	D	-	-	A	
Phosphoric Anhydride (Molten)	-	A	A	-	D	-	D	D	-	D	-	A	-	-	A	-	-	-	D	-	-	-	-	-	D	C	-	D	-	D	A	
Photographic (Developer)	-	C	A	C	C	A	A	-	D	-	A	-	-	A	C	-	-	B	A	-	A	A	-	A	A	-	A	-	-	-	A	
Phthalic Anhydride	B	A	B	-	B	-	A	B	-	C	C	-	-	A	-	-	-	-	-	-	-	-	-	-	A	C	-	-	-	-	-	
Picric Acid	B	A	A	-	C	-	A	D	D	D	D	A	A	A	-	-	-	-	-	-	-	-	-	-	-	A	A	D	A	-	A	
Plating Solutions																																
Antimony Plating 130° F	-	-	A	-	-	A	A	-	-	-	A	-	A	A	-	D	-	-	A	-	-	A	-	-	A	A	D	A	-	-	B	
Arsenic Plating 110° F	-	-	A	-	-	A	A	-	-	-	A	-	A	A	-	A	-	-	A	-	-	-	C	-	A	A	D	A	-	-	B	
Brass Plating																																
Regular Brass Bath 100° F	-	-	A	-	-	A	A	-	-	-	A	-	A	A	-	A	-	-	A	-	-	-	6	C	-	A	A	D	A	-	-	B
High Speed Brass Bath 110° F	-	-	A	-	-	A	A	-	-	-	A	-	A	A	-	A	-	-	A	-	-	-	-	D	-	A	A	D	A	-	-	B
Bronze Plating																																
Copper-Cadmium Bronze Bath R.T.	-	-	A	-	-	A	A	-	-	-	A	-	A	A	-	A	-	-	A	-	-	-	C	-	A	A	D	A	-	-	B	
Copper-Tin Bronze Bath 160° F	-	-	A	-	-	A	A	-	-	-	D	-	A	A	-	A	-	-	A	-	-	-	-	D	-	A	A	D	B	-	-	C

A—No effect—Acceptable
 B—Minor effect—Acceptable
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 D—Severe effect—Not Recommended

1. P.V.C.—Satisfactory to 72° F.
 2. Polypropylene—Satisfactory to 72° F.
 3. Polypropylene—Satisfactory to 120° F.
 4. Buna-N—Satisfactory for "O" Rings
 5. Polyacetal—Satisfactory to 72° F.
 6. Ceramag—Satisfactory to 72° F.

	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Aluminum	TITANIUM	HASTELLOY C	Cast Bronze	Brass	Cast Iron	Carbon Steel	PVC (Type 1)	Tygon (E-3606)	Teflon	Noryl	Polyacetal	Nylon	Cyclocac (ABS)	Polyethylene	POLYPROPYLENE	RYTON	CARBON	CERAMIC	CERAMAGNET "A"	VITON	BUNA N (NITRILE)	Silicon	Neoprene	Ethylene Propylene (EPM)	Rubber (Natural)	Epoxy	
Platings (Cont.)																																
Copper-Zinc Bronze Bath 100° F	-	-	A	-	-	A	A	-	-	-	-	A	-	A	A	-	A	-	-	A	-	-	C	-	A	A	-	A	-	-	B	
Cadmium Plating																																
Cyanide Bath 90° F	-	-	A	-	-	A	A	-	-	-	-	A	-	A	A	-	A	-	-	A	-	-	C	-	A	A	-	A	-	-	B	
Fluoborate Bath 100° F	-	-	A	-	-	D	A	-	-	-	-	A	-	A	A	-	D	-	-	A	-	-	D	-	A	B	-	C	-	-	B	
Chromium Plating																																
Chromic-Sulfuric Bath 130° F	-	-	C	-	-	A	A	-	-	-	-	A	-	A	D	-	D	-	-	A	-	-	A	-	C	D	-	D	-	-	D	
Fluosilicate Bath 95° F	-	-	C	-	-	C	A	-	-	-	-	A	-	A	D	-	D	-	-	A	-	-	B	-	C	D	-	D	-	-	D	
Fluoride Bath 130° F	-	-	D	-	-	C	A	-	-	-	-	A	-	A	D	-	D	-	-	A	-	-	B	-	C	D	-	D	-	-	D	
Black Chrome Bath 115° F	-	-	C	-	-	A	A	-	-	-	-	A	-	A	D	-	D	-	-	A	-	-	A	-	C	D	-	D	-	-	D	
Barrel Chrome Bath 95° F	-	-	D	-	-	C	A	-	-	-	-	A	-	A	D	-	D	-	-	A	-	-	A	-	C	D	-	D	-	-	D	
Copper Plating (Cyanide)																																
Copper Strike Bath 120° F						A	A	A	-	-	-	-	A	A	-	-	-	-	-	-	-	-	C	-	B	-	-	A	-	-		
Rochelle Salt Bath 150° F	-	-	A	-	-	A	A	-	-	-	-	D	-	A	A	-	A	-	-	A	-	-	D	-	A	A	-	B	-	-	C	
High Speed Bath 180° F	-	-	A	-	-	A	A	-	-	-	-	D	-	A	A	-	A	-	-	A	-	-	D	-	A	A	-	B	-	-	C	
Copper Plating (Acid)																																
Copper Sulfate Bath R.T.	-	-	D	-	-	A	A	-	-	-	-	A	-	A	A	-	D	-	-	A	-	-	A	-	A	A	-	A	-	-	D	
Copper Fluoborate Bath 120° F	-	-	D	-	-	D	A	-	-	-	-	A	-	A	A	-	D	-	-	A	-	-	D	-	A	B	-	C	-	-	D	
Copper (Misc.)																																
Copper Pyrophosphate 140° F	-	-	A	-	-	A	A	-	-	-	-	A	-	A	A	-	A	-	-	A	-	-	B	-	A	A	-	A	-	-	B	
Copper (Electroless) 140° F	-	-	-	-	-	-	D	-	-	-	-	A	-	A	A	-	A	-	-	A	-	-	A	-	A	D	-	D	-	-	B	
Gold Plating																																
Cyanide 150° F	-	-	A	-	-	A	A	C	-	-	-	D	-	A	A	-	A	-	-	A	-	-	B	-	A	A	-	A	-	-	D	
Neutral 75° F	-	-	C	-	-	A	A	-	-	-	-	A	-	A	A	-	A	-	-	A	-	-	A	-	A	A	-	A	-	-	A	
Acid 75° F	-	-	C	-	-	A	A	-	-	-	-	A	-	A	A	-	A	-	-	A	-	-	A	-	A	A	-	A	-	-	A	
Indium Sulfamate Plating R.T.	-	-	C	-	-	A	A	-	-	-	-	A	-	A	A	-	D	-	-	A	-	-	A	-	A	A	-	A	-	-	A	
Iron Plating																																
Ferrous Chloride Bath 190° F	-	-	D	-	-	A	D	-	-	-	-	D	-	A	A	-	D	-	-	C	-	-	A	-	A	B	-	D	-	-	D	
Ferrous Sulfate Bath 150° F	-	-	C	-	-	A	A	-	-	-	-	D	-	A	A	-	D	-	-	A	-	-	A	-	A	A	-	B	-	-	D	
Ferrous Am. Sulfate Bath 150° F	-	-	C	-	-	A	A	-	-	-	-	D	-	A	A	-	D	-	-	A	-	-	A	-	A	A	-	B	-	-	D	
Sulfate-Chloride Bath 160° F	-	-	D	-	-	A	D	-	-	-	-	D	-	A	A	-	D	-	-	A	-	-	A	-	A	B	-	C	-	-	D	
Fluoborate Bath 145° F	-	-	D	-	-	D	B	-	-	-	-	D	-	A	A	-	D	-	-	A	-	-	D	-	A	B	-	C	-	-	D	
Sulfamate 140° F	-	-	D	-	-	A	B	-	-	-	-	A	-	A	A	-	D	-	-	A	-	-	A	-	A	A	-	A	-	-	A	
Lead Fluoborate Plating	-	-	C	-	-	D	A	-	-	-	-	A	-	A	A	-	D	-	-	A	-	-	D	-	A	B	-	C	-	-	A	
Nickel Plating																																
Watts Type 115-160° F	-	-	C	-	-	A	A	-	-	-	-	D	-	A	A	-	A	-	-	A	-	-	A	-	A	A	-	A	-	-	D	
High Chloride 130-160° F	-	-	C	-	-	A	A	-	-	-	-	D	-	A	A	-	D	-	-	A	-	-	A	-	A	A	-	B	-	-	D	
Fluoborate 100-170° F	-	-	C	-	-	D	A	D	-	-	-	D	-	A	A	-	D	-	-	A	-	-	D	-	A	B	-	C	-	-	D	
Sulfamate 100-140° F	-	-	C	-	-	A	A	-	-	-	-	A	-	A	A	-	A	-	-	A	-	-	A	-	A	A	-	A	-	-	D	
Electroless 200° F	-	-	-	-	-	-	-	-	-	-	-	D	-	A	D	-	D	-	-	D	-	-	A	-	A	D	-	D	-	-	B	
Rhodium Plating 120° F	-	-	D	-	-	D	D	-	-	-	-	A	-	A	A	D	D	-	-	A	-	-	A	-	A	A	-	B	-	-	A	
Silver Plating 80-120° F	-	-	A	-	-	A	A	-	-	-	-	A	-	A	A	-	A	-	-	A	-	-	B	-	A	A	-	A	-	-	A	
Tin-Fluoborate Plating 100° F	-	-	C	-	-	D	A	-	-	-	-	A	-	A	A	-	D	-	-	A	-	-	D	-	A	B	-	C	-	-	A	
Tin-Lead Plating 100° F	-	-	C	-	-	D	A	-	-	-	-	A	-	A	A	-	D	-	-	A	-	-	D	-	A	B	-	C	-	-	A	
Zinc Plating																																
Acid Chloride 140° F	-	-	D	-	-	A	D	-	-	-	-	A	-	A	A	-	D	-	-	A	-	-	A	-	A	A	-	A	-	-	A	
Acid Sulfate Bath 150° F	-	-	C	-	-	A	A	-	-	-	-	D	-	A	A	-	D	-	-	A	-	-	A	-	A	A	-	B	-	-	D	

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	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Aluminum	TITANIUM	HASTELLOY C	Cast Bronze	Brass	Cast Iron	Carbon Steel	PVC (Type 1)	Tygon (E-3606)	Teflon	Noryl	Polyacetal	Nylon	Cyclocac (ABS)	Polyethylene	POLYPROPYLENE	RYTON	CARBON	CERAMIC	CERAMAGNET "A"	VITON	BUNA N (NITRILE)	Silicon	Neoprene	Ethylene Propylene (EPM)	Rubber (Natural)	Epoxy					
Sodium Hydroxide (20%)	-	A	A	A	D	A	A	C	D	A	-	A	B	A	A	D	C	C	B	A	A	C	D	A	A	A	D	B	A	A	A					
Sodium Hydroxide (50% Solution)	-	A	B	-	D	A	A	C	D	B	-	A	B	A	A	D	C	C	C	A	B	C	D	A	A	D	D	C	-	A	A					
Sodium Hydroxide (80% Solution)	-	A	D	-	D	A	B	C	D	C	-	A	B	A	A	D	C	C	C	A	B	C	D	A	B	D	D	C	-	B	A					
Sodium Hypochlorite ¹ (to 20%)	-	C	C	C	C	A	A	D	D	D	-	A	B	A	A	D	A	-	B	D	C	D	A	B	A	C	D	D	B	C	B					
Sodium Hypochlorite	D	-	A	-	D	A	A	D	-	D	D	A	-	A	A	-	A	-	-	A	C	-	D	-	D	B	C	A	-	-	A					
Sodium Hyposulfate	-	A	A	-	D	-	-	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	C	-	C	C				
Sodium Metaphosphate ²	A	-	A	-	A	-	-	C	C	B	B	-	-	A	-	B	A	-	-	D	-	A	A	-	A	A	-	B	A	A	A	A				
Sodium Metasilicate	A	-	A	-	B	-	-	B	-	C	C	-	-	A	-	D	-	-	-	-	A	-	-	A	A	D	A	-	-	A	A	A				
Sodium Nitrate	B	A	A	A	A	A	B	B	C	A	B	A	B	A	A	B	A	-	B	A	-	A	A	A	B	C	D	B	A	C	A	A				
Sodium Perborate	B	-	C	-	B	-	-	C	C	B	B	-	-	A	A	B	A	-	-	A	-	A	A	-	A	B	D	B	A	C	A	A				
Sodium Peroxide	B	A	A	-	C	-	B	C	C	D	C	A	-	A	-	D	D	-	-	-	-	A	A	-	A	C	D	B	A	C	A	A				
Sodium Polyphosphate (Mono, Di, Tribasic)	-	A	A	-	D	A	A	C	-	-	-	-	-	A	A	B	-	-	-	-	-	A	A	-	A	A	-	D	A	A	A	A				
Sodium Silicate	B	A	B	A	C	A	B	C	C	-	B	A	B	A	A	C	A	-	-	A	-	A	A	-	A	A	-	A	A	A	A	A	A			
Sodium Sulfate	B	A	A	C	B	A	B	B	B	A	B	A	-	A	A	B	A	-	B	A	A	A	A	-	A	A	-	A	A	A	C	A	A			
Sodium Sulfide	B	A	B	-	D	A	B	D	D	A	B	A	B	A	A	B	A	-	B	A	A	A	A	-	A	C	-	A	A	C	A	A	A			
Sodium Sulfite	-	C	C	-	C	A	A	C	-	A	-	A	A	A	-	D	-	A	-	-	A	-	A	A	-	A	A	-	A	A	A	A	A			
Sodium Tetraborate	-	-	A	-	-	-	-	-	-	-	-	-	A	A	-	A	B	-	-	-	A	A	-	A	A	-	A	A	-	-	-	-	A			
Sodium Thiosulfate ("Hypo")	A	A	A	-	B	A	-	D	D	C	B	A	-	A	A	C	A	-	-	A	A	A	A	-	A	B	-	A	A	C	A	A	A			
Sorghum	-	A	A	-	-	-	-	-	-	A	-	-	-	-	A	A	-	-	-	-	-	-	A	A	-	A	A	-	A	-	-	-	A			
Sauce	-	A	A	-	A	-	-	A	-	D	-	-	-	-	A	A	A	-	-	-	-	-	A	A	-	A	A	-	A	-	D	A	A			
Stannic Chloride	D	D	D	-	D	A	B	D	-	D	D	A	-	A	A	C	A	-	B	A	-	-	A	-	A	A	D	A	A	A	A	A	A			
Stannic Fluoborate	-	-	A	-	-	-	-	-	-	D	-	-	-	-	A	C	-	-	-	-	-	-	-	A	-	A	A	-	A	-	-	-	A			
Stannous Chloride	D	D	C	-	D	A	A	D	-	D	D	A	A	A	-	D	-	A	-	-	-	-	-	-	B	C	D	D	-	A	A	A	A			
Starch	B	A	A	-	A	-	-	B	-	C	C	A	-	A	A	A	A	-	B	-	-	-	A	A	-	A	A	-	A	-	-	-	-	A		
Stearic Acid ³	B	A	A	A	B	A	A	C	C	C	C	A	B	A	A	A	A	-	B	D	-	A	A	A	A	B	D	B	B	C	A	A	A			
Stoddard Solvent	A	A	A	A	A	A	A	A	A	B	B	A	D	A	D	A	A	B	D	D	A	A	A	-	A	B	D	D	D	D	A	A	A	A		
Styrene	A	A	A	-	A	-	-	A	-	-	A	-	-	A	A	A	-	-	-	-	-	-	-	A	A	-	B	D	D	D	D	D	A	A		
Sugar (Liquids)	A	A	A	A	A	-	A	A	-	B	B	-	-	A	A	A	B	-	A	-	-	A	A	A	A	A	-	B	-	A	A	A	A	A		
Sulfate Liquors	-	C	C	-	B	-	A	C	-	-	-	-	-	-	D	-	-	-	-	A	-	A	A	-	-	-	-	C	-	-	-	-	-	A		
Sulfur Chloride	-	D	D	D	D	-	-	C	D	-	-	A	C	A	D	A	-	A	D	-	A	D	-	A	C	-	A	D	-	D	D	D	C	A		
Sulfur Dioxide ⁴	-	A	A	C	A	A	B	B	-	-	D	B	A	D	B	D	D	C	D	A	A	A	-	D	D	C	B	A	D	A	A	A	A	A		
Sulfur Dioxide (Dry)	A	A	A	-	A	-	A	A	C	A	B	D	-	A	-	-	A	-	D	-	-	A	A	-	A	-	A	-	D	-	D	D	D	D		
Sulfur Trioxide (Dry)	A	A	C	-	A	-	-	B	-	B	B	A	B	A	D	D	D	-	-	-	-	-	B	A	-	A	D	-	D	B	C	A	A	A		
Sulfuric Acid (to 10%)	-	D	C	C	C	A	A	D	D	D	-	A	B	A	A	D	D	B	B	A	A	A	A	-	A	C	-	D	D	C	A	A	A	A		
Sulfuric Acid (10%-75%) ⁵	-	D	D	D	D	C	B	D	D	D	-	A	B	A	B	D	D	B	C	A	B	A	D	C	A	D	-	D	D	D	B	B	B	B		
Sulfuric Acid 75%-100%	-	-	D	-	-	D	B	-	D	-	-	B	-	A	A	-	D	-	-	B	C	-	A	-	A	D	-	D	-	-	-	-	-	D		
Sulfurous Acid	C	C	B	C	C	A	B	D	-	D	D	A	B	A	A	D	D	-	B	A	-	B	A	-	B	A	-	A	C	D	B	B	C	A		
Sulfuryl Chloride	-	-	-	-	-	-	-	-	-	-	-	-	A	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	
Syrup	-	A	A	A	A	-	-	D	-	-	-	-	A	-	-	A	A	A	B	-	A	-	A	A	A	A	A	-	B	-	A	A	A	A		
Tallow	-	A	A	-	A	-	-	-	-	-	-	-	-	-	A	A	A	-	C	-	-	-	A	A	-	A	A	-	-	-	-	-	-	-	-	A
Tannic Acid	B	A	A	A	C	A	B	B	-	C	C	A	B	A	A	B	D	-	B	A	-	A	A	A	D	C	A	A	A	A	A	A	A	A	A	
Tanning Liquors	-	A	A	-	C	A	A	A	-	-	-	A	B	A	-	B	-	-	-	-	-	-	A	-	A	A	-	A	C	-	-	-	-	-	-	A
Tartaric Acid	B	A	B	B	C	A	B	A	C	D	D	A	B	A	A	B	A	-	B	A	-	A	A	-	A	D	C	A	-	A	A	A	A	A	A	

A—No effect—Acceptable
 B—Minor effect—Acceptable
 C—Moderate effect—Questionable
 D—Severe effect—Not Recommended

1. P.V.C.—Satisfactory to 72° F.
 2. Polypropylene—Satisfactory to 72° F.
 3. Polypropylene—Satisfactory to 120° F.
 4. Buna-N—Satisfactory for "O" Rings
 5. Polyacetal—Satisfactory to 72° F.
 6. Ceramag—Satisfactory to 72° F.

Attachment V-3

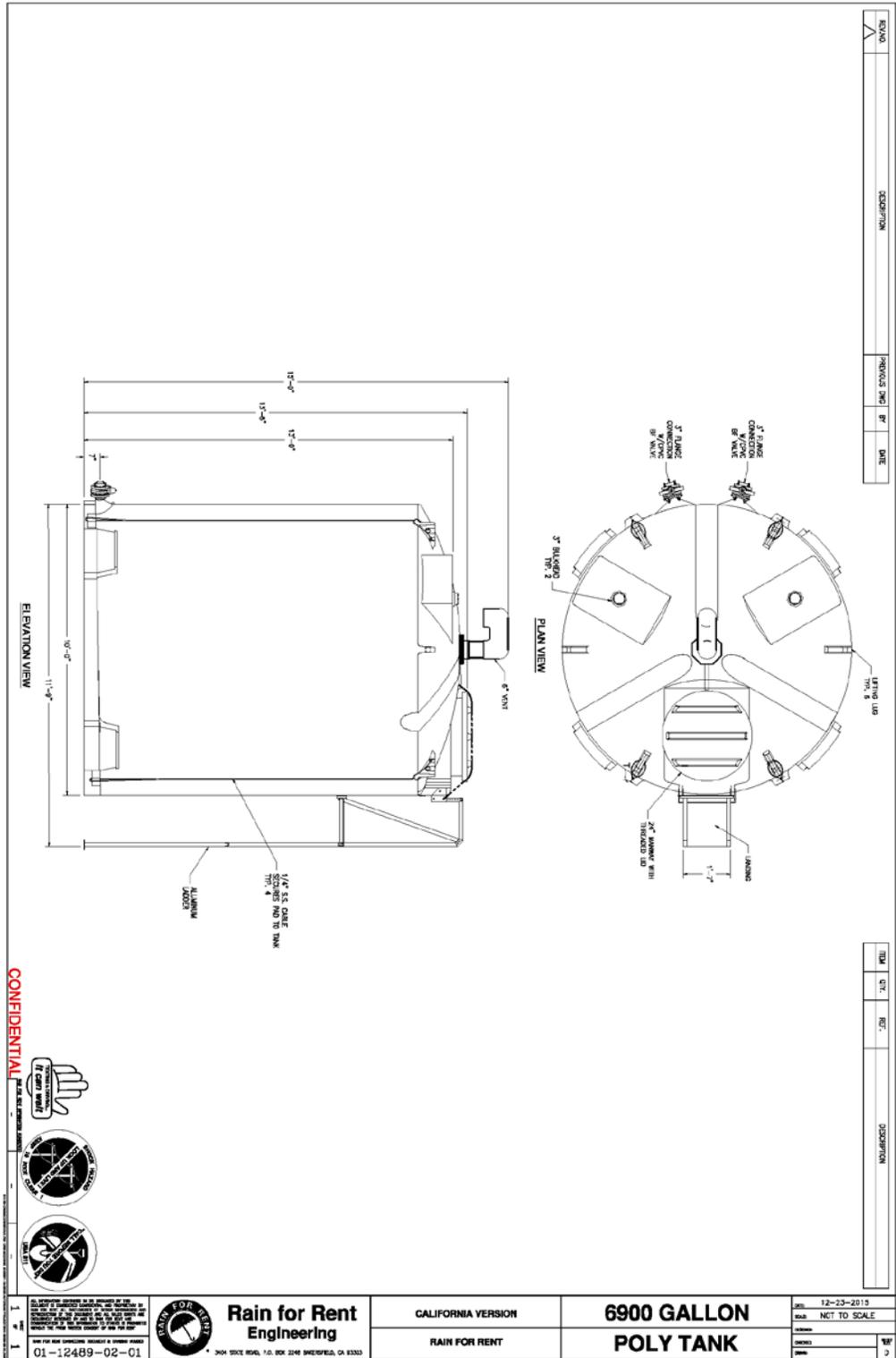
	302 Stainless Steel	304 Stainless Steel	316 Stainless Steel	440 Stainless Steel	Aluminum	TITANIUM	HASTELLOY C	Cast Bronze	Brass	Cast Iron	Carbon Steel	PVC (Type 1)	Tygon (E-3606)	Teflon	Noryl	Polyacetal	Nylon	Cyclocac (ABS)	Polyethylene	POLYPROPYLENE	RYTON	CARBON	CERAMIC	CERAMAGNET "A"	VITON	BUNA N (NITRILE)	Silicon	Neoprene	Ethylene Propylene (EPM)	Rubber (Natural)	Epoxy		
Tetrachlorethane	-	-	A	-	-	A	A	-	-	-	D	-	A	D	A	A	-	-	A	-	A	A	-	A	D	-	-	D	D	A			
Tetrahydrofuran	-	A	A	-	D	-	D	-	D	A	D	-	A	D	A	A	-	D	C	A	A	A	-	B	D	-	D	B	D	A			
Toluene, Toluol ²	A	A	A	-	A	A	A	A	A	A	D	D	A	D	A	A	D	D	D	A	A	A	A	C	D	D	D	D	D	A			
Tomato Juice	A	A	A	-	A	-	C	-	C	C	-	-	A	A	B	A	B	-	A	A	A	A	-	A	A	-	A	-	-	A			
Trichlorethane	-	C	A	-	C	A	C	-	C	-	-	-	A	D	A	-	-	-	-	-	A	A	-	A	D	D	D	D	D	A			
Trichlorethylene ²	B	A	A	-	B	A	A	B	A	C	B	D	-	A	D	A	C	D	D	D	C	A	C	A	D	D	D	D	D	A			
Trichloropropane	-	-	A	-	-	-	A	-	-	-	-	-	-	D	A	-	D	-	-	-	A	A	-	A	A	-	A	-	-	A			
Tricresylphosphate	-	-	A	-	-	B	A	A	-	-	-	D	-	A	A	C	-	-	-	-	-	A	A	-	B	D	-	D	A	-	A		
Triethylamine	-	-	-	-	-	-	A	-	-	-	A	-	-	B	D	-	-	-	-	-	-	A	A	-	A	A	D	B	-	-	A		
Turpentine ¹	B	A	A	-	C	-	A	B	C	B	B	A	B	A	D	A	A	-	D	B	A	A	A	-	A	D	-	D	D	D	A		
Urine	-	A	A	-	B	-	-	C	-	B	-	A	-	-	A	A	A	-	B	A	-	A	A	-	A	A	-	A	-	D	A	-	A
Vegetable Juice	-	A	A	-	A	-	-	C	-	D	-	-	-	-	A	A	A	-	-	-	-	A	A	-	A	A	-	A	B	D	-	D	A
Vinegar	A	A	A	A	D	A	A	B	B	C	D	A	-	A	A	B	A	B	B	A	A	A	A	A	C	-	B	A	C	A			
Varnish (Use Viton for Aromatic)	A	A	A	A	A	-	-	A	B	-	C	-	-	A	D	A	A	-	-	A	-	A	A	A	B	C	D	-	D	A			
Water, Acid, Mine	-	A	A	-	C	-	-	C	D	C	-	A	B	-	A	D	A	B	-	A	B	A	A	-	A	A	-	B	-	B	A		
Water, Distilled, Lab Grade 7	-	A	A	-	B	-	-	A	-	D	-	A	B	A	A	A	A	A	-	A	A	A	A	A	A	A	-	B	A	A	A		
Water, Fresh	A	A	A	-	A	-	-	A	C	B	D	A	B	A	A	A	A	A	D	A	A	A	A	A	A	A	-	B	A	A	A		
Water, Salt	-	A	A	-	B	-	-	B	C	D	-	A	B	-	A	A	A	-	-	A	A	A	A	A	A	-	B	A	A	A			
Weed Killers	-	A	A	-	C	-	-	C	-	-	-	-	-	-	A	A	-	-	-	-	A	A	-	A	B	-	C	-	-	A			
Whey	-	A	A	-	B	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	A	A	-	A	A	-	-	-	-	A		
Whiskey and Wines	A	A	A	A	D	-	-	B	B	D	D	A	-	A	A	A	A	-	B	A	-	A	A	-	A	A	B	A	A	A	A		
White Liquor (Pulp Mill)	-	A	A	-	-	-	A	D	-	C	-	A	-	A	A	D	A	-	-	A	-	A	A	-	A	A	-	A	-	-	A		
White Water (Paper Mill)	-	A	A	-	-	-	A	-	-	-	-	-	-	-	B	A	-	-	-	A	-	A	A	-	A	-	-	A	-	-	A		
Xylene ³	A	A	A	-	A	-	A	A	A	B	D	-	A	D	A	A	D	D	D	A	A	A	A	A	D	D	D	D	D	A			
Zinc Chloride	D	A	B	B	D	A	B	D	D	D	D	A	-	A	A	C	A	-	B	A	A	A	A	-	A	A	-	A	A	A	A		
Zinc Hydrosulphite	-	-	A	-	D	-	-	D	-	D	-	-	-	-	A	C	-	-	-	-	A	A	A	-	-	A	-	A	A	-	A		
Zinc Sulfate	B	A	A	A	D	A	B	B	C	C	D	C	B	A	A	C	A	-	B	A	A	A	A	-	A	A	-	A	A	C	A		

A—No effect—Acceptable
 B—Minor effect—Acceptable
 C—Moderate effect—Questionable
 D—Severe effect—Not Recommended

1. P.V.C.—Satisfactory to 72° F.
 2. Polypropylene—Satisfactory to 72° F.
 3. Polypropylene—Satisfactory to 120° F.
 4. Buna-N—Satisfactory for "O" Rings
 5. Polyacetal—Satisfactory to 72° F.
 6. Ceramag—Satisfactory to 72° F.

NOTES

Attachment V-4 Typical Polyethylene Vessel



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 01-12489-02-01

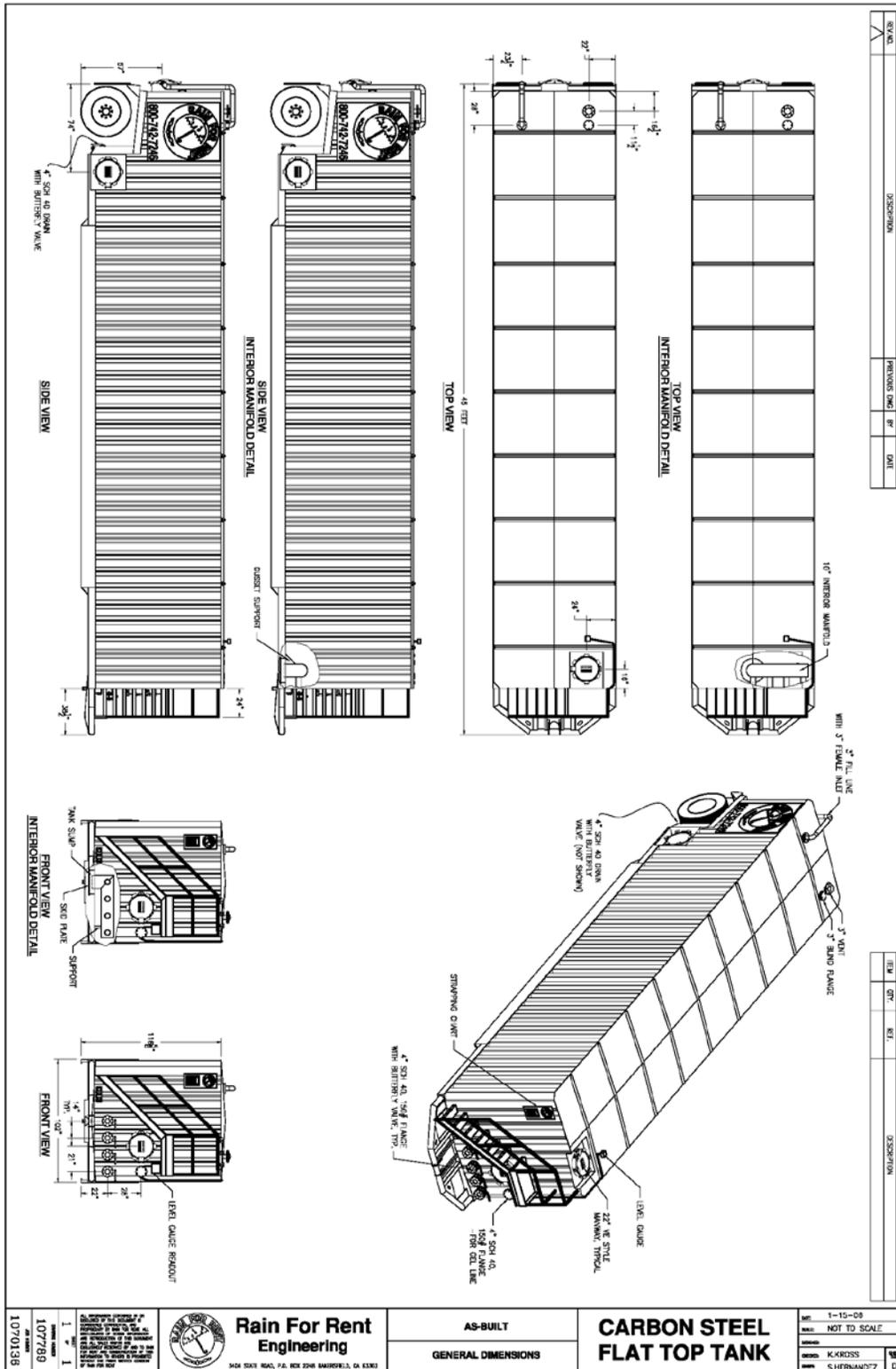
RAIN FOR RENT
 Engineering
 304 5932 8568, FAX 800 2249 8462/REDD, CA 93303

CALIFORNIA VERSION
 RAIN FOR RENT

**6900 GALLON
 POLY TANK**

DATE: 12-23-2015
 SCALE: NOT TO SCALE
 DRAWN: [blank]
 CHECKED: [blank]
 TITLE: [blank]

Attachment V-5 Typical Steel Vessels



REV.	DESCRIPTION	PREPARED	DATE

REV.	QTY.	BY	DESCRIPTION

107789
1070136

Rain For Rent Engineering
2500 STATE ROAD, P.O. BOX 2000, WASHINGTON, GA 30391

AS-BUILT
GENERAL DIMENSIONS

**CARBON STEEL
FLAT TOP TANK**

1-15-09
NOT TO SCALE
K-KROSS
SHERMAN/D7

Attachment V-5 Typical Steel Vessels

REAR VIEW

TOP VIEW

SIDE VIEW

FRONT VIEW

NOTES:

1. This drawing is a baseline representation for this model of tank. Variations between this drawing and the actual equipment in the field can and do exist, primarily with appearance locations, sizes and quantities. Consult your local BakerCorp representative if specific needs exist.
2. THIS TANK IS NOT DESIGNED FOR TRANSPORTING LIQUIDS. It should be moved only when empty.
3. Tanks of this type have an internal lining (coating) on the wetted surface.
4. This tank is equipped with a pressure/vacuum relief valve set at 1.0 lbf/sq. in. pressure and 0.4 oz./sq. in. vacuum.

RECOMMENDATIONS:

- 1) Tank Capacity: 21,000 gallons (300 BBL)
- 2) Tank Weight: 25,500 lbs. (empty)

SCALE: Do Not Scale **B**

DATE: 7/12/03 **BY:** [Signature]

TITLE: MODERN MFG. "Y" BOTTOM FIXED AXLE TANK

REV.: 1 OF 1

PROJECT: S-2-M0007-1- A

BAKER CORP. 300 OLD HANCOCKWAY
SEAL BEACH, CA 90732-2701

1) FABRICATE ALL WELDS TO MEET THE FOLLOWING:

- 1) FABRICATE ALL WELDS TO MEET THE FOLLOWING:
- 2) FABRICATE ALL WELDS TO MEET THE FOLLOWING:
- 3) FABRICATE ALL WELDS TO MEET THE FOLLOWING:
- 4) FABRICATE ALL WELDS TO MEET THE FOLLOWING:
- 5) FABRICATE ALL WELDS TO MEET THE FOLLOWING:
- 6) FABRICATE ALL WELDS TO MEET THE FOLLOWING:
- 7) FABRICATE ALL WELDS TO MEET THE FOLLOWING:
- 8) FABRICATE ALL WELDS TO MEET THE FOLLOWING:
- 9) FABRICATE ALL WELDS TO MEET THE FOLLOWING:
- 10) FABRICATE ALL WELDS TO MEET THE FOLLOWING:
- 11) FABRICATE ALL WELDS TO MEET THE FOLLOWING:
- 12) FABRICATE ALL WELDS TO MEET THE FOLLOWING:
- 13) FABRICATE ALL WELDS TO MEET THE FOLLOWING:
- 14) FABRICATE ALL WELDS TO MEET THE FOLLOWING:
- 15) FABRICATE ALL WELDS TO MEET THE FOLLOWING:

VI. Safety and Emergency Equipment

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- A. Safety Equipment
- B. Emergency Equipment
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 - 2. Internal Alarm and Warning System
 - 3. Safety Showers and Eyewashes
 - 4. First-Aid Supplies
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 - 7. Spill Response and Control Equipment
- C. Schedule for Testing and Maintaining Safety and Emergency Equipment
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 - 2. Fresh Water System
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- F. Protection of Water Supply Systems for Human Use

List of Enclosures

- Table VI-1 Safety and Emergency Equipment at the Chevron Richmond Refinery HWTSF
- Table VI-2 Safety and Emergency Equipment for Spill Response and Control at the Chevron Richmond Refinery HWTSF
- Figure VI-1 Water Line Warning Sign

VI. Safety and Emergency Equipment

Map #3 shows locations of the HWTSF's safety and emergency equipment. Table VI-1 lists and describes the safety and emergency equipment. Table VI-2 lists and describes the spill control and response equipment.

A. Safety Equipment

For instructions on PPE used by HWTSF personnel, see Section III, Entry Procedures, and Section VII, Operating Procedures.

B. Emergency Equipment

1. External Communication System

External communication equipment includes several telephones located in the HWTSF Office building that are available to all HWTSF personnel and visitors. In the event of an electrical or telephone failure, the HWTSF is equipped with a battery-operated two-way radio located in the HWTSF Office building.

2. Internal Alarm and Warning System

The HWTSF has an intercom system with three access locations to the HWTSF. Personnel within the HWTSF are notified of emergency situations by the activation of two evacuation sirens. The sirens are located on the east and west boundaries of the HWTSF so they can be heard by all individuals working within and just outside the HWTSF. The sirens are tested per Section X, Inspection Procedures.

3. Safety Showers and Eyewashes

Safety showers and eyewashes are located where accidental exposures could most likely occur. Safety showers and eyewashes are inspected per Section X, Inspection Procedures.

4. First-Aid Supplies

See Map #3.

5. Fire Protection Equipment

Fire protection equipment is easily accessible in Areas I through V in locations which are most likely to require this equipment. Map #3 shows the various types of fire protection equipment at the HWTSF. Table VI-1 lists and describes this equipment.

6. Emergency Power Supply and Lighting

In the event of a power outage, diesel powered generators are available to rent from third party vendors servicing the refinery. In addition, diesel-powered portable emergency lights and a ready supply of working flashlights and batteries are available from the same location.

7. Spill Response and Control Equipment

Spill response and control equipment is listed and described in Table VI-2 and located as shown on Map #3.

C. Schedule for Testing and Maintaining Safety and Emergency Equipment

Safety and emergency equipment is inspected and maintained as described in Section X, Inspection Procedures.

D. Water Supply

There are three types of water systems used at the HWTSEF:

- Fire Fighting
- Fresh Water
- Drinking Water

Each system is completely segregated from the others. The fresh water and drinking water systems are both potable water provided by the local Utility District but serve different purposes. The fire fighting system water supply is not intended for human use or consumption. The locations of the three water systems are shown on Map #2 and the systems are described below:

1. Water for Fire Fighting and for Use With Foam Systems

The HWTSEF's fire fighting system consists of three 1-1/2 inch hose reel/foam stations with an inlet water pressure of ~80 psig. These stations include 75 feet of hard rubber hose, a fiberglass tank with 55 gal. of foam concentrate, a fog/straight stream nozzle, and a foam or water bypass eductor with check valve and a percent injection setting. The system is sized for a discharge flow rate of 60 gpm. Water is supplied to these units by a 2-inch line from the Refinery's high pressure fire fighting system which is maintained at 150 psig.

2. Fresh Water System

There are four fresh water connections. These connections are used with fire hose and fog/straight stream nozzles for utility purposes such as wash down, cooling, and quenching the two sump pumps located at the main sump. It may also be used as back-up for foam stations. There are several hoses that run off of this line for purposes such as wash down and decontaminating equipment.

3. Drinking Water System

Drinking water is supplied to the HWTSEF from the Refinery drinking water system.

E. Labeling of Water Supply Systems for Human Use

All taps which supply water for the fire fighting system have warning signs which indicate that the water is not suitable for human use or consumption. The locations of these taps are shown on Map #3. The bright yellow warning signs state "NON-POTABLE WATER" in both English and Spanish, as shown on Figure VI-1. The signs are inspected per Section X, Inspection Procedures.

F. Protection of Water Supply Systems for Human Use

The fresh water and drinking water systems have back-flow protection provided by line segregation, double check valves, and bleeder valves. The valves and bleeders are located wherever the fresh water or drinking water lines are tapped into the larger main Refinery system lines. In addition, strict rules exist for tie-ins of the Refinery drinking water system.

Table VI-1

Safety and Emergency Equipment at the Chevron Richmond Refinery HWTSF

Name	Quantity Available	Location Area	Description	Use and Capabilities
Hard Hat	Min. of 6 Hats on Hand at All Times	K	Protective head gear meeting MSA standards.	Issued to all employees and visitors. Provides protection from head injuries.
Goggles	Min. of 1 Case on Hand at All Times	K	Polycarbonate mono-goggles.	Issued to all employees, protects eyes from splashes and some projectiles.
Safety Glasses	Min. of 6 Pair on Hand at All Times	K	Impact-resistant glass eyeglasses.	Issued to all employees and visitors. Provides protection from direct frontal splashes and projectiles.
Gloves	Min. of 1 Case on Hand at All Times	K	PVC knit liner.	Provides hands and wrists with protection against chemical exposures. Type of glove chosen depends on the fineness of work required and type of chemical exposure.
Boots	Min. of 6 Pair on Hand at All Times	K	PVC mid-calf and over boots.	Provides protection to feet and lower legs from chemical exposures.
Protective Suits	Min. of 1 Case on Hand at All Times	I	Full body, coated impermeable, and full body with hoods.	Provides protection to body from moderately hazardous chemical exposures (OSHA Level B and C protection).
Respirators	Min. of 6 Pcs. on Hand at All Times	K	Full face cartridge respirators.	Provides protection to lungs and respiratory system from chemical exposures.
Self-Contained Breathing Apparatus	4	A, E, F, & M	Self-contained breathing apparatus with ~30 minutes of air in tanks.	Provides full respiratory and eye protection from highly toxic or low oxygen environments.
Eyewash/Safety Shower	4	A, F, G & J	Standard industrial eyewash/ safety shower combination.	Fixed emergency washing facilities to water flush eyes or entire body to remove chemical contamination. Located near four hazard areas for immediate use by victims and/or assistants.
First Aid Kit	1	J	Standard industrial first-aid kit.	Provides emergency first-aid equipment to HWTSF personnel.

Table VI-1 (Cont'd)

Safety and Emergency Equipment at the Chevron Richmond Refinery HWTSF

Name	Quantity Available	Location Area *	Description	Use and Capabilities
Fire Extinguishers	8	A, B, E, F, H, J & L	Various industrial rated fire extinguishers, including: dry chemical fire extinguishers, water/foam units, unpressurized.	Portable emergency fire extinguishers, located in five potentially hazardous areas for immediate use by HWTSF personnel.
Evacuation Sirens	2	Near Northwest Vehicle Gate & Along Office Bldg	Edwards GS duotonic 13V siren or equivalent.	Emergency evacuation device used to notify HWTSF personnel and guests of impending danger and to evacuate the HWTSF immediately.
Gas Detector	As Needed	HWTSF Office	Hand-held electronic unit.	Available for use to measure lower explosive limit (LEL), oxygen and hydrogen sulfide. Includes warning alarm when 10% of the LEL is reached.
pH Paper	1	J	Litmus paper.	Color reactive paper that can measure the pH between 0-13.
Generators	As Needed	On Site Rental Company	Diesel powered.	Back-up power supply used during power outages.
Portable Lights	As Needed	On Site Rental Company	Diesel powered portable lighting system.	Back-up portable lighting system used during power outages.
MSDS	As Needed	HWTSF Office	Describes components of waste and associated hazardous property.	Available for use by all employees to describe hazardous properties and assist in determining handling/storage methods.

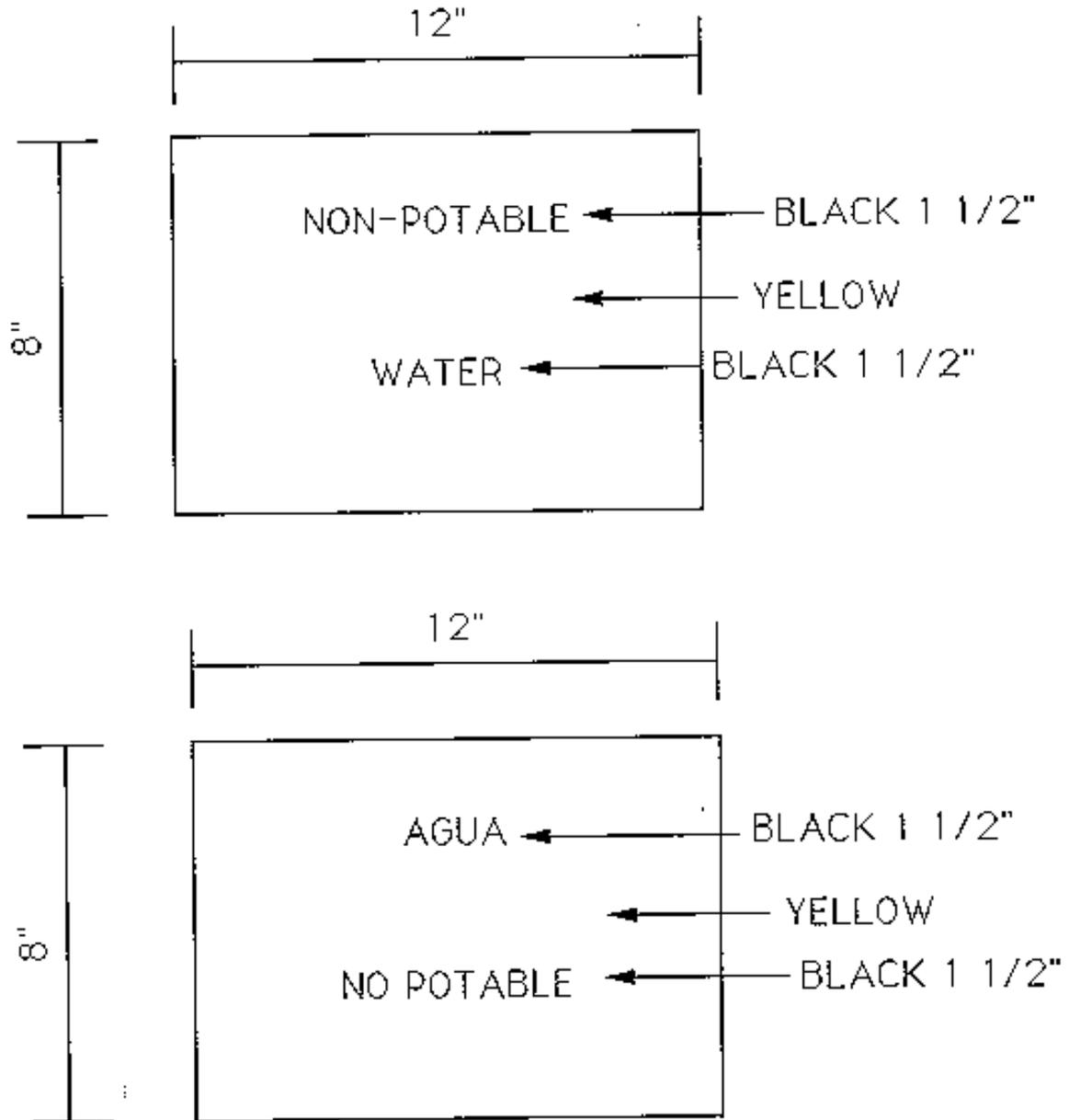
Table VI-2

**Safety Equipment for Spill Response and
Control at the Chevron Richmond Refinery HWTSF**

Name	Quantity Available	Location Area *	Description	Use and Capabilities
Spill Control Pillows	Several Cases Available at All Times	K	Spill response and control pillows constructed of synthetic absorbent material	Each pillow can absorb up to 250 mL of spilled liquid waste material.
Oil Spill Control Booms	Several Cases Available at All Times	K	Spill response and control booms.	Polyethylene booms which can contain and control liquid waste spills up to 8" deep and 10' wide.
Oil Spill Control Sheets	Several Cases Available at All Times	K	Spill response and control sheets.	Each sheet can cover an area up to 2.5 sq. feet, for hazardous solid waste storage/spill, to protect the subsurface from potential contamination.
Dam Kit / Temporary Barrel Dike	4	K	Spill response and control dam kit and temporary barrel dike constructed of polyethylene.	Each kit can contain and control a liquid waste spill that is 4" deep by 4' wide.
Hazardous Material Bags	Several Cases Available at All Times	K	Polyethylene hazardous material bags.	Each polyethylene bag can contain up to 1.5 cu. feet of solid hazardous wastes and should not be used for liquid wastes or wastes incompatible with plastic.
Polypropylene Shovel	1	K	Non-sparking polyethylene shovel or equivalent.	Non-sparking shovel is used to scoop up highly flammable liquid and solid hazardous wastes in hard-to-reach areas or cleanup of residuals.
Polyethylene Hand Pumps	2	K	Polyethylene hand pumps or equivalent.	Used to pump liquid wastes in the event of a mechanical pump failure and into vacuum trucks in the event of a spill. Pumps can safely handle corrosive and petroleum-based products.
Floor Dry	Pallet, Containing ~50 Bags	B	50 lb bags.	An all-purpose absorbent used to contain and control liquid hazardous spills.

Figure VI-1

Water Line Warning Sign



VII. Operating Procedures

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- B. Written Operating Records
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VII. Operating Procedures

The Plot Plan for the HWTSE showing the individual areas is provided as Map #3.

A. Personal Protective Clothing and Devices

All persons handling hazardous wastes at the HWTSE are properly protected with, at a minimum:

- Fire Retardant Coveralls
- Gloves
- Appropriate Shoes
- Safety Glasses or Goggles
- Hard Hat

When containers are open, respirators, protective suits, and face shields are used as required.

For information and complete listings of PPE, safety equipment, and spill response equipment at the HWTSE, see Section VI, Safety and Emergency Equipment.

Inspection of all protective equipment is conducted as detailed in Section X, Inspection Procedures.

Respirators are inspected and cleaned after each use, or per the Inspection Procedures in Section X.

All protective clothing not designated as disposable such as boots and goggles are decontaminated after each use. Hard hats are also decontaminated when it has been determined that contamination has occurred.

Coveralls and gloves are always removed immediately following use and placed in marked containers within the personnel change/shower trailer shown on Maps #2 and #3.

B. Written Operating Records

Refer to Section XII for recordkeeping requirements.

C. Management of Hazardous Waste, Containers, and Vessels

This subsection serves as an operating guideline for the HWTSE Supervisor and the HWTSE operators handling waste at the HWTSE. It includes:

- Waste Characterization and Acceptance Criteria
- Waste Storage
- Waste Handling
- Tracking Movements of Waste Within the HWTSE
- Spill Response

1. Waste Characterization and Acceptance Criteria

Figure VII-1 is a flowchart summarizing typical waste receiving procedures.

- The HWTSF does not accept wastes generated outside of the Refinery except as potentially allowed by a variance, exemption, or exclusion.
- The HWTSF Supervisor and/or designated back-up must be thoroughly familiar with Table VIII-1. This table describes:
 - How all waste streams must be characterized prior to entering the HWTSF.
 - Frequency required for recharacterization of each waste stream.
- Waste is inspected and compared against the accompanying Intra-Refinery trucking permit. An example of the current trucking permit is shown in Figure VII-2. If a comparison of the waste and information on the trucking permit shows one of the following discrepancies, it must be resolved before the shipment can be accepted:
 - volume, greater than 10% for bulk volume or any variation in container count
 - Container type.
 - Physical state.

A new analysis may be requested to recharacterize the waste.

2. Waste Storage

a) *Assignment to Correct Area of HWTSF*

Assignment of wastes to specific areas is made based on an evaluation of the wastes' hazardous properties or characteristics. This determination may be made by:

- Reviewing Table VIII-2 to determine what waste types may be stored in which area.
- Using the flowchart shown in Figure VII-1.
- Analyzing laboratory data.
- Reviewing the Intra-Refinery trucking permit.
- Reviewing material safety data sheets (MSDSs).
- Using the standard chemical compatibility chart in Figure VII-3.
- Performing a waste compatibility test as described in Section VIII.

b) *Labeling of Containers/Vessels*

All containers and vessels are labeled in compliance with CCR Title 22, §66264.34 to identify the type of waste stored and the hazardous properties of the wastes. Figures VII-4, VII-5, and VII-6 show examples of typical labels for containers, vessels, and PCB waste. These labels must be filled out accurately and completely.

c) Waste Compatibility With Container/Vessel Type

Figure VII-3 is the chemical compatibility chart used by the HWTSE personnel when placing wastes in containers. The chart illustrates potential incompatibilities to be avoided. A HWTSE operator will ensure that all wastes are compatible with the containers they are being placed in. New wastes transferred into a container already storing an accumulation of waste are checked for compatibility by comparing the waste description on the identification labels of both containers.

d) Maintaining Closed Containers/Vessels

Containers and vessels are kept closed except when adding or removing waste, sampling, gauging, inspecting, and container/vessel decontamination.

e) Managing Incompatible, Ignitable, and Reactive Wastes

Wastes are segregated during storage based on chemical compatibility, ignitability, reactivity, and other chemical/physical properties. Separation of incompatible wastes is achieved through the use of separate storage areas. Each area handles a specific waste type or group of wastes, such that all wastes within a given area are compatible with each other. (See also Section VIII.) Ignitable or reactive wastes are segregated by placement in separate containers/vessels. All ignitable or reactive waste is stored at least 50 feet from the property line of the Refinery. Smoking is prohibited in the HWTSE.

- Area I - Wastes are stored within two metal storage buildings. Each building has three rooms, separated by metal walls. Incompatible wastes may be stored in adjacent rooms. Each room has an individual dead-end sump for leak containment. If liquid leaks from a drum in any one of the rooms, the liquid is contained in the sump in that room and does not come into contact with other containers or with sumps in adjacent rooms.
- Area IV - Ignitable and reactive solid wastes placed in bins in Area IV are segregated from other incompatible wastes by placement in separate nonadjacent bins.
- Areas II, III, and V - Effective labeling and testing for waste compatibility virtually eliminates the possibility of placing incompatible wastes in the same vessel. The wastes that are stored in the vessels do not react with, and are not corrosive to, the vessel structural material, or to other wastes within the vessel. If the waste that is to be placed in a vessel is not compatible with what the vessel previously contained, the vessel is decontaminated before the new waste is loaded. This prevents uncontrolled reactions of incompatible, reactive, or ignitable wastes.

f) Aisle Space and Separation of Operating Areas

Adequate aisle space is provided throughout the HWTSE to allow the unobstructed movement of emergency equipment and personnel. As specified in Table VIII-2, and as shown on Map #2, all areas at the HWTSE are separated from the next closest area by a distance sufficient to allow the passage and movement of the Refinery fire response vehicles.

For the vessels, the minimum distance from any public way or from the nearest building on the site that is not an integral part of the process is at least 10 feet.

3. Handling Waste, Containers, and Vessels

Drums are placed and secured on pallets and handled with a forklift for placement within waste storage areas and movement within the HWTSF. Forklift pockets or drum grip attachments are utilized to ensure safe movement. Bins are unloaded and loaded using hydraulic equipment on the truck designed for that use. These practices minimize the chance of damaging containers during handling. Vessels are not moved when full.

See Section V, Waste Management Equipment, Table V-2.

4. Tracking Waste Movements Within the HWTSF

See Section XII, Recordkeeping.

5. Spill Response

In the event of a spill, a suitable absorbent or barrier is used to contain the waste until the cleanup is complete, preventing dispersion of the waste. If any container is found to be in poor condition (i.e., leaks or partially crushed) the contents will be immediately transferred to an overpack container. For damaged or leaking bins or vessels, if necessary, temporary secondary containment devices will be used in the area while the contents are transferred into another bin or vessel in good condition. Any spill will be cleaned up immediately.

6. Prevention of Vessel Failure

Hazardous wastes that are allowed to be stored/treated at the HWTSF are listed in Table VIII. An inert gas such as nitrogen may be used for blanketing to eliminate oxygen and for agitation, and activated carbon may be used for scrubbing processes. The treatment procedures, as detailed in Section IX, are designed to safely add treatment reagents with the wastes without causing the potential for incompatible reactions or increased pressure. Reactions that can occur as part of the treatment process are carefully controlled.

The volume of wastes stored and/or treated in vessels is controlled in order to maintain low pressure and eliminate the potential for container/vessel rupture. Liquid levels are gauged according to Section X, Inspection Procedures.

7. Vessel Overfill Control

All vessels are visually inspected during filling to control the liquid level and protect against overfilling. All the treatment and liquid transfer processes are batch processes at the HWTSF; therefore there is no need for automatic flow intervention systems. Flow control is accomplished manually.

8. Protection of Containers From Deterioration

Small quantity containers are stored in the enclosed buildings in Area I. These buildings protect the containers from exposure to weather elements. Containers stored on safety pallets are covered with a tarpaulin. The bins are covered and are constructed of durable steel designed for outdoor use. The covered polyethylene bins are also stored in this area.

D. Subpart CC Compliance

1. Use of Containers

The HWTSF occasionally accepts wastes for which Subpart CC air emission controls are required. Wastes may be in a variety of container types including but not limited to drums, pails, portable containers, and rolloff bins. The capacity of the portable containers may range up to 20,000 gallons or more. Containers for Subpart CC wastes may be stored in any of the five waste management areas. Many of the containers are only received for temporary storage before shipment to an outside TSDF and do not require handling of the waste or opening of the container at the Richmond HWTSF. Tanks are not used for storage of hazardous waste.

2. Waste Determinations

A waste determination is made to ascertain applicability of the Subpart CC standards for a given batch of waste. (If the waste will be managed in compliance with Subpart CC standards regardless of organics content, an explicit waste determination may not be made.) Analytical testing and/or generator knowledge may be used for the determination. EPA Method 25D is the most commonly used method to determine volatile organics content, but other approved methods may also be used. The HWTSF WAP contains more details on waste testing.

3. Container Management and Controls

Wastes are stored in containers designed and constructed appropriately to contain the waste and minimize emissions. An appropriate control option is selected based on the allowable options, the size of the container, and waste characteristics.

Containers requiring Level 1 and 2 controls are kept closed except when adding, removing, or sampling the waste. Waste exposure to the air is minimized and container covers are secured closed with no visible gaps after transfer or sampling is complete. In addition, Level 2 containers using the “no detectable organic emissions” compliance option are checked for emissions using EPA Method 21.

The HWTSF occasionally treats waste in containers requiring either Subpart CC Level 3 controls or operating with emission controls meeting applicable Clean Air Act requirements [as described in CCR Title 22, §66264.1080(b)(7)]. A California air permit may also be required. The treatment process will depend on the specific requirements for a given batch of waste. Emissions may be controlled by an enclosure vented to a vapor control device and/or venting the treatment container directly to a control device such as activated carbon or hydrocarbon recovery.

Treatment requiring Level 3 controls would meet applicable Subpart CC standards as outlined in CCR Title 22, §66264.1086-1089 for enclosures, closed vent and control devices, inspection, monitoring, and recordkeeping.

If treating in a container equipped with controls meeting requirements of the Clean Air Act under 40 CFR, §60, §61, or §63, a certification will be kept on file identifying the specific requirements being met for the unit.

4. Inspection and Recordkeeping

Containers are visually inspected within 24 hours of receipt to insure they are properly labeled and closed with no visible gaps, and to insure the container is in good condition with no leaks. Weekly inspection of containers is conducted per Section X. Efforts to repair any defects found during inspection will be made within 24 hours, and the container will either be repaired or emptied and taken out of service within 5 days.

For treatment in containers using Level 3 controls, an operation, inspection, and monitoring plan will be prepared for the specific treatment operation. Applicable requirements from CCR Title 22, §66264.1086-1089 will be addressed, including:

- Waste transfer procedures to minimize exposure to the air.
- Enclosure, closed vent, and control device standards per §66264.1086(e) and §264.1087 (e.g., no detectable emission or negative pressure operation, 95% VOC removal efficiency, performance testing requirements, daily inspection, repair time limits, etc.).
- Recordkeeping per §66264.1089(d).

Records for analytical results, inspection and monitoring logs, and waste tracking information are filed as detailed in Section XII, Recordkeeping.

5. Reporting

Any non-compliance is reported to the DTSC as discussed in Section XII.

E. Choosing Appropriate Treatment

See Section IX, Treatment Procedures.

F. Inspection of Containers/Vessels

Containers and vessels are inspected per Section X, Inspection Procedures.

G. Decontamination of Equipment

Equipment such as forklifts, hoses, and pumps that are contaminated with waste are decontaminated before use with incompatible materials or use in non-hazardous areas. Decontamination includes use of high-pressure water and steam cleaning.

H. Methods to Collect and Dispose of Contaminated Wash Water

Wash water is typically generated by decontamination of equipment, containers, and vessels. It is collected in a container or vessel for analysis. Wash water that is generated by decontamination of personnel outside of the decontamination trailer is contained in small pools and discharged to the main sump for analysis.

If it is to be discharged to the Refinery's effluent treatment system, it is analyzed for compliance with hazardous waste regulations and the Refinery's NPDES permit. Analytical methods will depend on the anticipated potential contaminants in the water, and will be conducted in accordance with the Waste Analysis Plan requirements, detailed in Section VIII. If tested clean, the water is discharged to the main sump to await discharge to the Refinery's effluent treatment system. If not clean, the water may be additionally treated as allowed by Section IX.

I. Storage of PCB Waste

PCB waste (polychlorinated biphenyls) is stored at the HWTSE in Area I. The HWTSE may store PCB waste at concentrations of up to 5000 ppm PCBs. No transformers containing over 500 gal. of PCB-contaminated oil are accepted at the HWTSE.

PCB transformers may be stored outside in Area I on safety pallets with sumps designed to contain 25% of the total internal volume of transformer oil. (See Attachment VIII-1 for calculations.) Transformers stored outside in this manner are thoroughly covered with a tarpaulin to prevent rainwater from coming into contact with the transformers. Any rainwater collected in the pallet sump is removed for sampling to determine proper management.

The following TSCA (Toxic Substances Control Act) requirements must be met:

- 1-year time limit for storage and disposal.
- Any PCB waste spilled must be cleaned up in accordance with the PCB Spill Cleanup Policy in Title 40 CFR, §761.
- Containers must meet DOT requirements in Title 49 CFR, §171 through §180.
- Must decontaminate equipment that comes in direct contact with PCBs before it leaves the storage/accumulation area.
- Recordkeeping:
 - Must maintain records of inspections, maintenance, cleanups, and disposal according to 40 CFR, §761.180(a) and (b).
 - Records must be maintained with HWTSE's annual records.

Storage of PCBs meets all requirements of Title 40 CFR, §761.65.

- Adequate roof and walls are provided (i.e., a metal building) to prevent rainwater from contacting the stored PCBs and PCB items.
- The sump inside the metal building provides a containment volume equal to 25% of the total internal volume of all PCB articles or PCB containers stored (see Appendix VIII-2 for secondary containment calculations).
- The room in the metal building used to store PCBs has a dead-end sump and no drain valves, floor drains, or other opening exits, which could permit liquids to flow from the building.
- The floors and walls of the building are constructed of continuous, smooth, and impervious steel to prevent or minimize penetration of PCBs.
- The HWTSE is located above the 100-year floodwater elevation.

- Signs and labeling of PCB drums and the building, as specified in the regulations, are provided. An example of a typical PCB label is shown on Figure VII-6.

J. Medical Attention Needed

All cuts, bruises, splashes, or other waste exposures occurring within the HWTSE are reported to the HWTSE Supervisor, the Chevron Fire Department, and the Refinery's Safety Group. First-aid kits are kept at the HWTSE for treatment of minor injuries not requiring professional medical attention. The Chevron Fire Department typically responds to incidents requiring first aid attention. When necessary, any Chevron employee requiring professional medical attention is immediately taken to the Refinery Medical Clinic for examination and then to a local hospital as warranted. Contractors are taken to a hospital of their choice by the contractor foreman. The details surrounding the incident would be captured and reported in the Refinery's designated Incident Reporting Database. The Refinery's Instruction RI-405 contains additional procedures and checklists to be followed in the event of medical care and transportation for any sick or injured personnel.

K. Emergency Response

Refer to Section XIII, HWTSE Contingency Plan, Refinery Instruction #422.

Implementation of the Contingency Plan is not required for responding to incidental releases of hazardous waste or hazardous constituents where the waste can be absorbed, neutralized, or otherwise controlled at the time of release by personnel in the immediate release area.

The Contingency Plan is implemented immediately whenever there is a fire, explosion, or release of hazardous waste that could threaten human health or the environment. The decision to implement the plan should only be made by the Emergency Coordinator identified in the Contingency Plan, Section XIII.

Figure VII-1

Waste Receiving Procedures

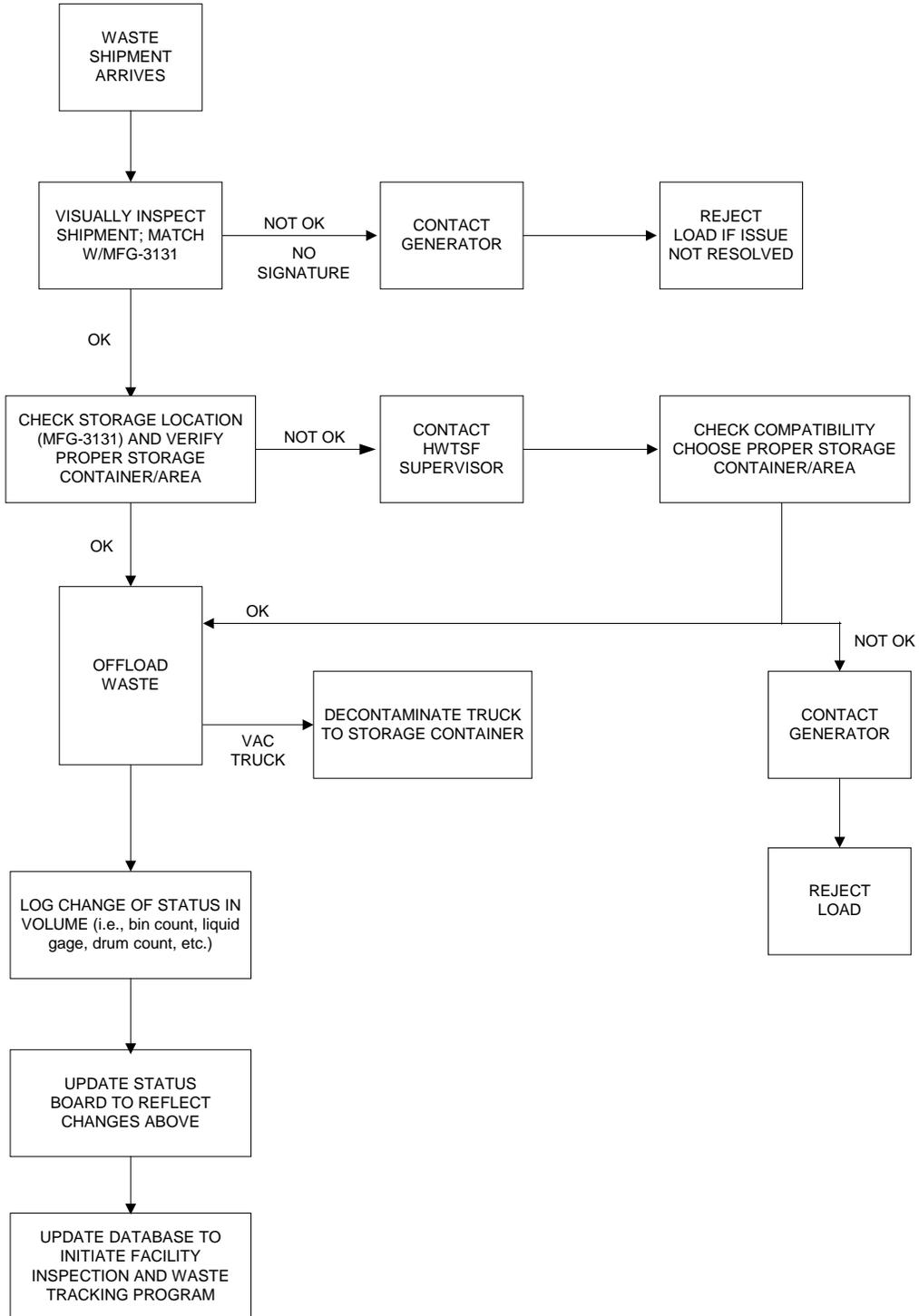


Figure VII-2 Intra-Refinery Trucking Permit

Intra Refinery Trucking Permit - MFG-3131			Haz Waste Use Only
Date Submitted: _____		Date Needed: _____	
			Job & Req'n # _____
<i>Form must be completely filled out to process request.</i>			
ABU/Section _____	Plant _____	Source (Tank, line, vessel, collection point, etc.) _____	Regulated Material <input type="checkbox"/> Yes <input type="checkbox"/> No
Cost Center _____	Maximo Number _____	Item Number _____	
Material _____	Physical State <input type="checkbox"/> Liquid <input type="checkbox"/> Sludge <input type="checkbox"/> Solid		
Estimated Quantity _____	MSDS Number(s) _____	Material Temp. Ambient _____ °F	
Special approval may be required to access restricted roads or areas of the refinery. Contact the Haz Waste Liquid Specialist ext. 2-2294 for details.		Job Coverage <input type="checkbox"/> Days Only <input type="checkbox"/> Around the clock <input type="checkbox"/> Weekends <input type="checkbox"/> Specific Time _____ : _____ to _____ : _____	
Will a laborer be working with the driver? (Labor must be provided by Operations) <input type="checkbox"/> Yes <input type="checkbox"/> No			
Specific Tools Required <input type="checkbox"/> Drum Slinger <input type="checkbox"/> Containment Pool <input type="checkbox"/> 1/2 barrel <input type="checkbox"/> Other _____			
Type of Container		Liquids Handling	
Solids Handling <input type="checkbox"/> Sealed Top Bin <input type="checkbox"/> Vacuum Bin <input type="checkbox"/> Phase Separator Bin		Mild Steel 500 Bbl Tank <input type="checkbox"/> Poly Tank <input type="checkbox"/> Air Mover Vacuum Truck	
		Small Quantity <input type="checkbox"/> Drums <input type="checkbox"/> Steel <input type="checkbox"/> Poly Quantity _____ Container Numbers _____ <input type="checkbox"/> Other _____	
Type of Vacuum Truck	<input type="checkbox"/> Any <input type="checkbox"/> 70 Bbl. <input type="checkbox"/> 36 Bbl. <input type="checkbox"/> 120 Bbl.	<input type="checkbox"/> Mild Steel <input type="checkbox"/> Stainless	Hoses Needed _____ Ft. <input type="checkbox"/> 6" Flex <input type="checkbox"/> Any <input type="checkbox"/> 2" <input type="checkbox"/> 3" <input type="checkbox"/> 4" <input type="checkbox"/> 6" Pipe
Known Hazards		Components	
Flash Point _____ °F	H ₂ S _____ PPM	_____ %	
pH _____	Benzene _____ PPM	_____ %	
Pressure _____ PSI	Other _____	_____ %	
Signature: _____		_____ %	
Safety Equipment Required		Laborer(s) Only	
<input type="checkbox"/> Acid Suit(s) <input type="checkbox"/> Poly Tyvek <input type="checkbox"/> Tyvek		<input type="checkbox"/> Supplied Air <input type="checkbox"/> A/P Respirator Half-face <input type="checkbox"/> A/P Respirator Full-face	
		All Personnel Involved <input type="checkbox"/> Face Shield <input type="checkbox"/> SCBA / Fresh Air <input type="checkbox"/> A/P Cartridge Type _____	
		<input type="checkbox"/> Goggles <input type="checkbox"/> Rubber Boots <input type="checkbox"/> Rubber Gloves <input type="checkbox"/> Other _____	
Contact Person _____	Radio Channel / Pac-set # or Pager # _____	Telephone Number / Extension _____	
Supervisor's Signature _____	Radio Channel / Pac-set # or Pager # _____	Telephone Number / Extension _____	
For Hazardous Waste Section Use Only			
Priority Level Ranking <input type="checkbox"/> 1-High <input type="checkbox"/> 2-Med. <input type="checkbox"/> 3-Low		Special Management Required (Check One) <input type="checkbox"/> Bz NESHAP <input type="checkbox"/> Subpart CC <input type="checkbox"/> N/A	
Disposal/Offload Location _____		Haz Waste Approval _____	
Special Instruction(s) _____			
Material Classification <input type="checkbox"/> Hazardous <input type="checkbox"/> Non-Hazardous <input type="checkbox"/> Product <input type="checkbox"/> Recyclable			
Company Used _____	Driver _____	Regular Hours _____	OT Hours _____
Truck Number _____	Quantity (Bbls) _____	Comments _____	

REVISED: 03/13 (Replaces 12/09)
Certified as current and accurate 03/13

506-1
MFG-3131 (3-13)

Figure VII-4

Hazardous Waste Label

**HAZARDOUS
WASTE**

STATE AND FEDERAL LAW PROHIBITS IMPROPER DISPOSAL.
IF FOUND, CONTACT THE NEAREST POLICE OR PUBLIC SAFETY
AUTHORITY, THE U.S. ENVIRONMENTAL PROTECTION AGENCY, OR
THE CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL.

NAME OF WASTE _____

CONTACT PERSON _____ DIV. _____ EXT. # _____

Phy. State (Circle One)	Hazardous Prop. (Circle One or more)
SOLID GAS LIQUID	TOXIC CORROSIVE IGNITABLE REACTIVE

ACCUMULATION START DATE _____

HANDLE WITH CARE!
CONTAINS HAZARDOUS OR TOXIC WASTES

EOD NO.
Container No.

SHIPPING INFORMATION (EOD USE ONLY)

NAME CHEVRON USA PRODUCTS CO. EPA I.D. # CAD 009114919

ADDRESS P.O. BOX 1272, 841 CHEVRON WAY

CITY RICHMOND STATE CA ZIP 94802-0272

MANIFEST DOCUMENT NO. _____

PROPER D.O.T. SHIPPING NAME _____

Figure VII-5

Vessel Sign

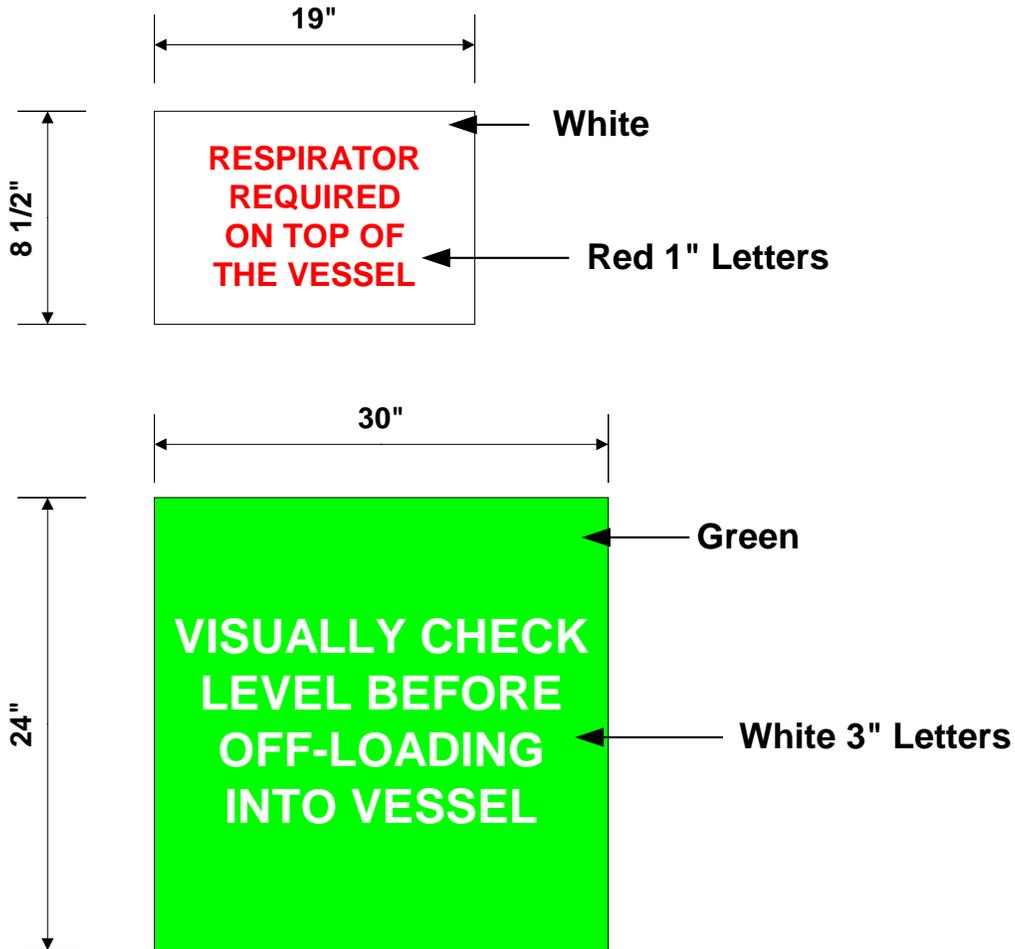
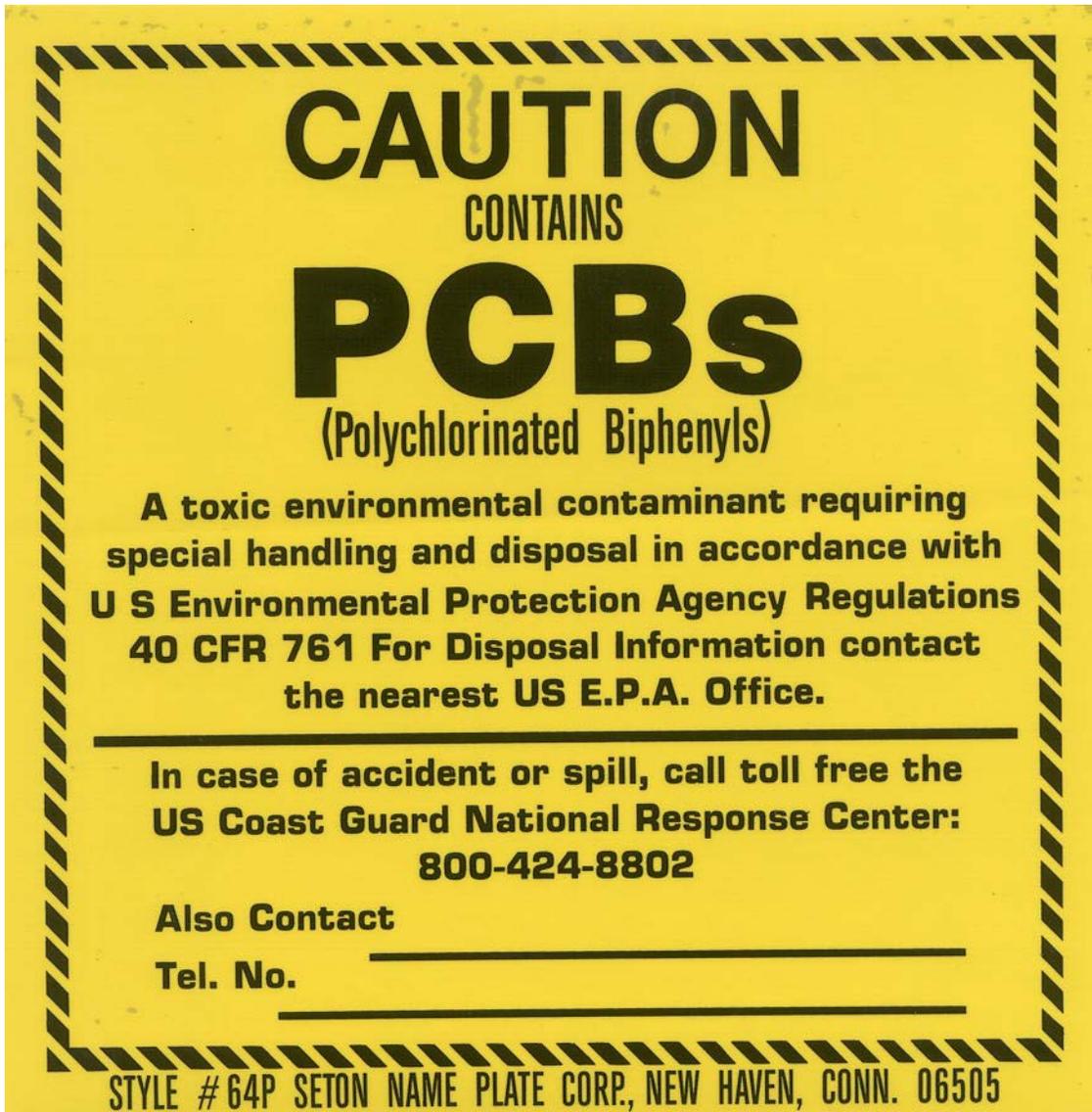


Figure VII-6

PCB Label



VIII. Permitted Waste Streams, Descriptions of Areas I-V, and Sampling Plan

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VIII. Permitted Waste Streams, Descriptions of Areas I-V, and Sampling Plan

A. Introduction

This section is one of the most important sections in this Operations Plan. Table VIII-1 contains information required for the HWTSF WAP (waste analysis plan). Acceptance of waste into the HWTSF depends on compliance with this table.

The final decision of which parameters an incoming waste will be analyzed for will be determined on a case-by-case bases using:

- Generator knowledge which includes:
 - Knowledge of the materials used and the processes generating the waste, and/or
 - Previous analytical
- Information from MSDSs

Table VIII-2 contains information such as:

- Which types of waste may be stored/treated in a given area within the HWTSF,
- Maximum amounts allowed to be treated per day,
- Maximum waste quantities allowed per area, and
- Secondary containment information for each area.

**Table VIII-1 – Permitted Waste Streams Table
Wastes Allowed To Be Stored and Treated at the HWTSF**

Waste or Material Type	EPA Waste Codes	California Waste Codes	Parameters Waste Will Be Tested For	Rational for Choosing Parameters	Frequency for Retesting	Incompatible With...	Typical Physical Properties	Typical Chemical Composition	Production Process That Produced Waste	Est'd Annual Qty, Tons
Abrasive Blasting Media	D004, 6 – 10	181	CAM Metals	Waste verification and information required for proper lab packing, bulking, treatment, and/or storage.	Each source of abrasive blasting media will be sampled at least annually for profiling or sooner if the process or operation generating them has changed.	Acids should not contact sulfide-bearing wastes as this may release H ₂ S.	Solid Black and/or Brown Granular Blasting Media pH = 5 to 10	As = 0 – 265 ppm Cr = 0– 450 ppm Pb = 0– 370 ppm Ni = 0–1600 ppm Cu = 0–2500 ppm Sulfides = 0 – 200 ppm	This waste stream is generated as a result of abrasive blasting and cleaning refinery equipment.	250
API Separator Waste										
Semi-Solid	D003, 4, 6, 9, 10, 18 K051	222	CAM Metals Benzene Reactivity	Waste verification and information required for proper lab packing, bulking, treatment, and/or storage.	Each source of API sludge will be sampled at least annually for profiling or sooner if the process or operation generating them has changed.	Oxidizers are incompatible with hydrocarbon bearing wastes.	Brown or Black Sludge Approximate % Oil/Water/Solids Oil = 6% Water = 76% Solids = 18% pH = 7 to 10	Ni = 0–20 ppm Cr = 0–10 ppm Hg = 0–4 ppm As = 0–20 ppm Se = 0–10 ppm Sulfides = 0–25 ppm	API separator semi-solid is generated at three API separators, which handle the primary treatment of the refinery's process waste.	1300
Post-Treatment Solids	D003, 4, 6, 9, 10, 18 K051	352	% Water/Solids CAM Metals Benzene Reactivity	To determine treatment effectiveness.	10% of each waste stream for representative analysis.	Acids should not contact sulfide-bearing wastes as this may release H ₂ S.				
Carbon	D001, D018	581, 352	Benzene Ignitability	Waste verification and information required for proper lab packing, bulking, treatment, and/or storage.	Each source of spent carbon will be sampled at least annually for profiling or sooner if the process or operation generating them has changed. 10% of each waste stream for representative analysis.	Oxidizers are incompatible with hydrocarbon bearing wastes.	Black Granular Carbon pH = 2.5 to 10.5	As = 0–7 ppm Cr = 0–350 ppm Cu = 0–2265 ppm Ni = 0–250 ppm Sulfides = 0–130 ppm Benzene = 0–750 ppm	Liquid phase filtration or gas scrubbing.	35
Catalyst										
Pre-Treatment Catalyst	D001, D003 D004, 6-10 K171, K172	161, 162, 141,	Ignitability Reactivity Benzene	Waste verification and information required for proper lab packing, bulking, treatment, and/or storage.	Each source of spent catalyst will be sampled at least annually for profiling or sooner if the process or operation generating them has changed. Metals are not analyzed because catalyst composition is already known.	Oxidizers are incompatible with hydrocarbon bearing wastes.	Pellets of Blue, Green, Brown, and/or Black pH = 3 to 13	Benzene = 0–15 ppm Sulfides = 0–350 ppm Toluene = 0–40 ppm Xylene = 0–50 ppm Metals as per catalyst type.	Spent catalyst is a waste produced by reactors in the Refinery process. Once a catalyst no longer performs to specifications it is changed out and either reclaimed, regenerated or disposed of. This waste stream comes in direct.	2000
Post-Treatment Catalyst	D001 D004, 6-10 K171, K172	161, 162, 141	Self-Heating Benzene Reactivity	To determine treatment effectiveness.	10% of each waste stream for representative analysis.					

**Table VIII-1 – Permitted Waste Streams Table
Wastes Allowed To Be Stored and Treated at the HWTSF**

Waste or Material Type	EPA Waste Codes	California Waste Codes	Parameters Waste Will Be Tested For	Rational for Choosing Parameters	Frequency for Retesting	Incompatible With...	Typical Physical Properties	Typical Chemical Composition	Production Process That Produced Waste	Est'd Annual Qty, Tons
Chemical Cleaning Solutions										
Pre-Treatment Liquid	D001, 4, 6-10, 18 D002 D003	792, 132, 342	Corrosivity Reactivity CAM Metals Ignitability Benzene	Waste verification and information required for proper lab packing, bulking, treatment, and/or storage.	Each source of spent chemical cleaning solution will be sampled at least annually for profiling or sooner if the process or operation generating them has changed.	Acids and bases are incompatible with each other. Oxidizers are incompatible with hydrocarbon bearing wastes.	Liquid Sp. Gr. = 1.0 to 1.3 pH = 0 to 14	As = 0-550 ppm Sb = 0-800 ppm Hg = 0-0.4 ppm Se = 0-2 ppm Cr = 0-50,000 ppm Ni = 0-182 ppm Tl = 0-15 ppm Be = 0-161 ppm Benzene = 0-3000 ppm Reactive Sulfides = 0-1000 ppm	Chemical cleaning solutions are produced by the chemical cleaning of equipment used in the refinery.	6000
Post Treatment Solids	D004, 6-10, 18	181	CAM Metals Benzene Reactivity Ignitability	To determine treatment effectiveness.	10% of each waste stream for representative analysis.	Acids should not contact sulfide-bearing wastes as this may release H ₂ S.				
Contaminated and/or Corrosive Aqueous Waste										
Pre-Treatment Liquid	D001 D002 D003 D004, 6-10, 18 D023, 24, 25	121, 122, 132, 135, 223, 791, 792	Corrosivity Reactivity Ignitability CAM Metals TCLP Metals Benzene	Waste verification and information required for proper lab packing, bulking, treatment, and/or storage.	Each source of contaminated and/or Corrosive aqueous waste will be sampled at least annually for profiling or sooner if the process or operation generating them has changed.	Acids and bases are incompatible with each other. Oxidizers are incompatible with hydrocarbon bearing wastes.	Liquid Sp. Gr. = 1.0 to 1.8 pH = ≤2 or ≥ 12.5	As = 0-45 ppm Cr = 0-115 ppm Ni = 0-200 ppm Se = 0-7 ppm Sulfides = 0-6025 ppm Benzene = 0-1100 ppm MEK = 0-300 ppm	Contaminated and/or Corrosive aqueous waste can be produced at acid or caustic injection facilities, from the collection of extracted groundwater or process water. Spent sulfuric and phosphoric acid can be generated at our alky/poly plants.	4000
Post Treatment Solids (if any)	D003 D004, 6-10, 18	181	CAM Metals Benzene Corrosivity Reactivity	To determine treatment effectiveness.	10% of each waste stream for representative analysis.	Acids should not contact sulfide-bearing wastes as this may release H ₂ S.				
Corrosive Solids										
Pre-Treatment Solids	D001 D002 D004, 6-10, 18 D023, 24, 25	181, 352	Corrosivity Ignitability CAM Metals Select Organics	Waste verification and information required for proper lab packing, bulking treatment, and/or storage.	Each source of corrosive solids will be sampled at least annually for profiling or sooner if the process or operation generating them has changed.	Acids and bases are incompatible with each other. Oxidizers are incompatible with hydrocarbon bearing wastes.	Solid Brown and/or Black pH = 1 to 13	Cd = 0-3 ppm Cr = 0-60 Cu = 0-40 Ni = 0-55 ppm V = 0-55 ppm Reactive Sulfides = 0-200 ppm	Corrosive solids are wastes produced by cleanup operations in the Refinery. Spills and remedial operations are two examples.	750
Post-Treatment Solids	D001 D004, 6-10, 18 D023, 24, 25	181, 352	Corrosivity	To determine treatment effectiveness.	10% of each waste stream for representative analysis.	Acids should not contact sulfide-bearing wastes as this may release H ₂ S.				
Decontamination Wash Water										
	Non-RCRA Toxic or Non-Hazardous	121, 122, 132, 135, 223, 791, 792, 801 or N/A	Corrosivity CAM Metals Benzene	To determine if hazardous constituents are present, if treatment is needed.	10% of each waste stream for representative analysis.	N/A	Liquid	Contaminants vary depending on type of material being handled.	Decontamination wash water is generated during decontamination operations. The water is then characterized to determine if hazardous constituents are present.	20

**Table VIII-1 – Permitted Waste Streams Table
Wastes Allowed To Be Stored and Treated at the HWTSF**

Waste or Material Type	EPA Waste Codes	California Waste Codes	Parameters Waste Will Be Tested For	Rational for Choosing Parameters	Frequency for Retesting	Incompatible With...	Typical Physical Properties	Typical Chemical Composition	Production Process That Produced Waste	Est'd Annual Qty, Tons
Discarded or Used Commercial Products	D001 D002 D003 D004, 6-11	141, 331, 343, 541, 791	Visual Inspection	MSDS and process information is sufficient to determine storage and disposal requirements.	N/A	Check MSDS and manufacturers label for hazards of the material and any incompatibilities.	Liquid or Solid	Chemical composition varies greatly depending on material being handled.	Discarded or used commercial products are used in various applications in the refinery. When they expire or are no longer used, they are brought into the HWTSF.	20
Heat Exchanger Semi-Solids										
Pre-Treatment Semi-Solid	D001, D002, D003 D004, 6, 8-10, 18 K050	223, 181, 791	Ignitability Corrosivity Reactivity CAM Metals Benzene	Waste verification and information required for proper lab packing, bulking, treatment, and/or storage.	Each source of heat exchanger sludge will be sampled at least annually for profiling or sooner if the process or operation generating them has changed.	Oxidizers are incompatible with hydrocarbon bearing wastes. Acids should not contact sulfide-bearing wastes as this may release H ₂ S.	Black and/or Brown Sludge	Cr = 0-415 ppm Hg = 0-100 ppm Se = 0-350 ppm Zn = 0-5500 ppm Benzene = 0-100 ppm	Heat exchanger sludge is generated during maintenance activities cleaning heat exchanger bundles.	40
Post-Treatment Solids	D001, D002 D004, 6, 8-10, 18 K050	223, 181, 791	Ignitability Corrosivity Reactivity % Water/Solids Benzene	To determine treatment effectiveness.	10% of each waste stream for representative analysis.					
Industrial Debris	Non-RCRA	223, 352, 181	None	Due to the diverse physical composition of this waste stream no analytical testing is performed.	N/A	Oxidizers are incompatible with hydrocarbon bearing wastes.	Oil contaminated Solid pH 4 to 10	TPH = ~1%	Industrial debris is contaminated trash such as oily rags, gloves, wood, etc. It is generated inside the HWTSF during routine duties.	350
Laboratory Wash Water	No EPA waste code. Hazardous properties may vary.	121, 122, 135, 132, 223, 791, 792, 801	In House Corrosivity In House CAM Metals	To determine if hazardous constituents are present, and if treatment is needed prior to disposal.	Monitor (in-house only) each time the lab poly container is full.	Incompatibility varies depending on material being handled in the lab.	Liquid Flash = > 200°F	Chemical composition varies depending on material being handled in the lab.	Bench testing of wastes for proper characterization and compatibility yields wash water after decontamination of lab. glassware occurs.	5
Leaded Tank Bottoms										
Pre-Treatment Semi-Solid	D001 D004, 6, 7, 9, 10, 18 K052	241, 132	Ignitability CAM Metals Benzene	Waste verification and information required for proper lab packing, bulking, treatment, and/or storage.	Each source of leaded tank bottoms will be sampled at least annually for profiling or sooner if the process or operation generating them has changed.	Oxidizers are incompatible with hydrocarbon bearing wastes. Acids should not contact sulfide-bearing wastes as this may release H ₂ S.	Sludge pH 5 to 9 Flash >80°F	Pb = 0-2200 ppm Hg = 0-5 ppm Zn = 0 Benzene = 0-1000 ppm	This waste stream is generated while desludging a tank, which contained a leaded product.	40
Post-Treatment Solids	D004, 6, 7, 9, 10, 18 K052	241	% Water/Solids Benzene Ignitability	To determine treatment effectiveness.	10% of each waste stream for representative analysis.					

**Table VIII-1 – Permitted Waste Streams Table
Wastes Allowed To Be Stored and Treated at the HWTSF**

Waste or Material Type	EPA Waste Codes	California Waste Codes	Parameters Waste Will Be Tested For	Rational for Choosing Parameters	Frequency for Retesting	Incompatible With...	Typical Physical Properties	Typical Chemical Composition	Production Process That Produced Waste	Est'd Annual Qty, Tons
Non-Leaded Hydrocarbon Tank Bottoms										
Pre-Treatment Semi-Solid	D001 D003 D004, 6-10, 18 D023, 24, 25 K169, K170	241, 132, 223	Ignitability Reactivity CAM Metals TCLP Metals Benzene Select Organics	Waste verification and information required for proper lab packing, bulking, treatment, and/or storage.	Each source of non-leaded hydrocarbon tank bottoms will be sampled at least annually for profiling or sooner if the process or operation generating them has changed.	Oxidizers are incompatible with hydrocarbon bearing wastes. Acids should not contact sulfide-bearing wastes as this may release H ₂ S.	Sludge pH = 4 to 10 Ignitability ≥ 130°F	As = 0-100 ppm Cr = 0-90 ppm Cu = 0-970 ppm Pb = 0-135 ppm Hg = 0-920 ppm Ni = 0-220 ppm Se = 0-7 ppm V = 0-460 ppm Reactive Sulfides = 0-3700 ppm Benzene = 0-170 ppm	This waste stream is generated while desludging any non-leaded storage tank.	120
Post-Treatment Solids	D003 D004, 6-10, 18 D023, 24, 25 K169, K170	241, 223, 352	Benzene Ignitability Reactivity % Water/Solids	To determine treatment effectiveness.	10% of each waste stream for representative analysis.					
PCB Wastes										
Transformer Oil	N/A — PCBs	261, 731	PCB's	To determine the degree of regulation.	Each source.	Oxidizers are incompatible with hydrocarbon bearing wastes.	Liquid or Solid	PCB's = ≥2 to 5000 ppm Metals as per waste stream	This waste stream is generated when a field transformer is removed from service, flushed, or when contaminated equipment is cleaned.	25
PCB Contaminated Material	N/A — PCBs	261, 731	None	This material will not be tested, as it is very difficult to obtain a representative sample. It will be handled as hazardous along with the PCB oils.	N/A					
Primary & Secondary Semi-Solids										
Semi-Solid	D001 D003 D004, 6, 9, 10, 18 F037, 38	222, 223	CAM Metals Benzene	Waste verification and information required for proper lab packing, bulking, treatment, and/or storage	Each source of primary & secondary oil/water/solids separation semi-solids will be sampled at least annually for profiling or sooner if the process or operation generating them has changed.	Oxidizers are incompatible with hydrocarbon bearing wastes. Acids should not contact sulfide-bearing wastes as this may release H ₂ S.	Black/Gray Sludge pH = 5 to 14 Ignitability ≥ 141°F	As = 0-235 ppm Cr = 0-730 ppm Cu = 0-1100 ppm Pb = 0-120 ppm Hg = 0-11 ppm Ni = 0-2190 ppm Se = 0-25 ppm Reactive Sulfides = 0-120 ppm Benzene = 0-195 ppm	Semi-solids from primary & secondary oil/water/solids separation.	500
Post-Treatment Solids	D003 D004, 6, 9, 10, 18 F037, 38	223, 352	% Water/Solids Benzene	To determine treatment effectiveness.	10% of each waste stream for representative analysis.					

**Table VIII-1 – Permitted Waste Streams Table
Wastes Allowed To Be Stored and Treated at the HWTSF**

Waste or Material Type	EPA Waste Codes	California Waste Codes	Parameters Waste Will Be Tested For	Rational for Choosing Parameters	Frequency for Retesting	Incompatible With...	Typical Physical Properties	Typical Chemical Composition	Production Process That Produced Waste	Est'd Annual Qty, Tons
Process Equipment Semi-Solids										
Pre-Treatment Semi-Solid	D001 D002 D003 D004, 6-10, 18	491, 352, 223, 132, 181	Ignitability Reactivity CAM Metals TCLP Metals Benzene	Waste verification and information required for proper lab packing, bulking, treatment, and/or storage.	Each source of process equipment sludge will be sampled at least annually for profiling or sooner if the process or operation generating them has changed.	Oxidizers are incompatible with hydrocarbon bearing wastes. Acids should not contact sulfide-bearing wastes as this may release H ₂ S.	Black/Gray Sludge pH = 5 to 14	As = 0-125 ppm Cr = 0-1040 ppm Cd = 0-45 ppm Co = 0-890 ppm Cu = 0-36000 ppm Pb = 0-17020 ppm Hg = 0-20 ppm Se = 0-18 ppm V = 0-280 ppm Ni = 0-415 ppm Benzene = 0-5 ppm	Process equipment sludge is generated by maintenance activity performed on columns, vessels, piping and other refinery equipment.	500
Post-Treatment Solids	D003 D004, 6-10, 18	352, 223, 181	Ignitability Reactivity Benzene % Water/Solids	To determine treatment effectiveness.	10% of each waste stream for representative analysis.					
RCRA Debris	D001 D002 D003 D00 4, 6-10, 18 F037, 38 K049, 50, 51, 169, 170, 171, 172	181, 352	Ignitability CAM Metals Benzene Corrosivity Reactivity	Waste verification and information required for proper lab packing, bulking, treatment, and/or storage.	Each source of RCRA debris will be sampled at least annually for profiling or sooner if the process or operation generating them has changed.	Oxidizers are incompatible with hydrocarbon bearing wastes.	Solid	Chemical composition varies greatly depending on contaminant.	Contaminated equipment, PPE, etc., from various refinery activities.	10
Rheniformer pH Control Solution										
Pretreatment Solution	D001 D018	121, 132, 223, 801	CAM Metals Benzene Ignitability	Waste verification and information required for proper lab packing, bulking, treatment, and/or storage.	Each source of Rhen pH control solution will be sampled at least annually for profiling or sooner if the process or operation generating them has changed.	Oxidizers are incompatible with hydrocarbon bearing wastes.	Liquid	Ni = 0-55 ppm Cu = 0-40 ppm Benzene = 0-4 ppm	Circulation fluid utilized during catalytic reformer shutdowns.	500
Post-Treatment Solids	D018	223, 352, 801	Benzene	To determine treatment effectiveness.	10% of each waste stream for representative analysis.					
Slop Oil/Emulsion Solids										
Pretreatment Sludge	D001, 3, 4, 6, 9, 10, 18 K049	222, 223	Ignitability Reactivity CAM Metals Benzene	Waste verification and information required for proper lab packing, bulking, treatment, and/or storage.	Each source of slop oil/emulsion solids will be sampled at least annually for profiling or sooner if the process or operation generating them has changed.	Oxidizers are incompatible with hydrocarbon bearing wastes. Acids should not contact sulfide-bearing wastes as this may release H ₂ S.	Black/Gray Sludge pH = 5 to 14 Flash = 70 to 300°F	Benzene = 0-210 ppm Toluene = 0-260 ppm As = 0-15 ppm Cr = 0-35 ppm Pb = 0-15 ppm Se = 0-3 ppm	This waste stream is generated while desludging tanks or process equipment containing emulsified hydrocarbon material.	500
Post-Treatment Solids	D001, 3, 4, 6, 9, 10, 18 K049	223, 352	Benzene Reactivity Ignitability	To determine treatment effectiveness.	10% of each waste stream for representative analysis.					

**Table VIII-1 – Permitted Waste Streams Table
Wastes Allowed To Be Stored and Treated at the HWTSF**

Waste or Material Type	EPA Waste Codes	California Waste Codes	Parameters Waste Will Be Tested For	Rational for Choosing Parameters	Frequency for Retesting	Incompatible With...	Typical Physical Properties	Typical Chemical Composition	Production Process That Produced Waste	Est'd Annual Qty, Tons
Spill Residues or Process Wastes										
Pretreatment Sludge	D001 D002 D003 D004, 6-10, 18 D023, 24, 25	Will Vary	Corrosivity Ignitability Reactivity TCLP Metals CAM Metals Select Organics	Generator knowledge or MSDS's will be used to determine which parameters the waste will be analyzed for. This analysis will be used to determine the hazardous criteria for manifesting and disposal.	Each separate event for spill residues. Process waste streams will be sampled at least annually for profiling or sooner if the process or operation has changed.	Will depend on material spilled or process stream.	Semi-Solid or Solid	Chemical composition varies greatly depending on material spilled or operation process that generated the waste.	General maintenance activities which produce mixtures to be discarded and spill clean-up which is typically discarded in drums and brought into the HWTSF after characterization is performed and the Part A is referenced.	100
Post-Treatment Solids	D003 D004, 6-10, 18 D023, 24, 25	Will Vary	Reactivity TCLP Metals CAM Metals Select Organics	Generator knowledge or MSDS's will be used to determine which parameters the waste will be analyzed for. This analysis will be used to determine the hazardous criteria for manifesting and disposal.	10% of each waste stream for representative analysis.					

Max Treatment Quantities per Day

<ul style="list-style-type: none"> Oxidation of Sulfidic Wastes, 21,000 Gal./Day Neutralization and pH Adjustment, 21,000 Gal./Day 	<ul style="list-style-type: none"> Reduction, Precipitation, Flocculation, and Sedimentation, 63,000 Gal./Day 	<ul style="list-style-type: none"> Oxidation of Pyrophoric Material, 16,200 Gal./Day Deliquescation, 42,000 Gal./Day 	<ul style="list-style-type: none"> Stabilization, 8,100 Gal./Day Sparging, Stripping, 21,000 Gal./Day
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Test Methods

Parameter	Test Method(s)
Ignitability	40 CFR 261.21, ASTM D 93
Corrosivity, Liquid	SW-846, Chapter 7
Corrosivity, Solid	SW-846, Chapter 7
Reactivity, Sulfide	SW-846, Chapter 7.3.4
Reactivity, Cyanide	SW846, Chapter 7.3.4
TCLP, Metals	SW-846, #6010 and/or #7470
TCLP, Volatiles	SW-846, #1311 and/or # 8260
TCLP, Semi-Volatiles	SW-846, #8270
TCLP, Organics	SW-846, #8260 and/or #8270
TCLP, Metals	SW-846, #6010 and/or #7470
STLC, Organics	WET (Calif), #8260 and/or #8270
STLC, Metals	WET (Calif.), #6010 and/or #7470
TTLIC, Organics	SW-846, #8260 and/or #8270
TTLIC, Metals	SW-846, #6010 and/or #7470 (7471A SW)
PCBs	SW-846, #8082
Aquatic Bioassay	22 CCR, 66261.24
Paint Filter Test	EPA 9095A

Table VIII-2 – Descriptions of Areas I–V

- For Each Area, a Description of:
 - Types of Wastes Allowed,
 - Waste Capacities, and
 - Secondary Containment

See the paving and drainage plan (Map #2) in Section XIV. The criteria used for design of secondary containment at the HWTSF with regard to stormwater and accidental spill retention capacity are as follows:

- The capability to safely store precipitation from a 24-hour, 25-year storm event, plus
- The capability to store 10% of the total volume of all containers, or 100% of the volume of the largest container, whichever is greater.
- For PCB storage, the capability to store 25% of the total volume of all containers.

Area	Types of Waste Allowed	General Description	Max. Waste Capacity	Min. Space Between Next Closest Area(s)	Method of Secondary Containment	Drainage Promotion	Capacity of Containment System	Run-on Prevention	Liquid Analysis and Overflow Prevention
I – Storage for Drummed Waste (Small Quantity Container Storage) Storage Only, No Treatment	All waste types listed on Waste Streams table in Section VIII may be stored in Area I.	<p>This 1198-square foot area is located on the southeast side of the site. It is used to store hazardous waste in small quantity containers. The containers are stored in segregated rooms within two storage buildings measuring ~200 square feet each. Fresh air is supplied by the ventilation systems.</p> <p>Wastes in Area I will be stored in container types per Section V, Waste Management Equipment. Small quantity containers may also be stored outside on pallets with built-in sumps.</p> <p>Rooms 1,2, and 3 are equipped with automatic water extinguishing system.</p> <p>Rooms 4,5, and 6 are equipped with automatic dry chemical fire extinguishing system. The systems are activated when there is an increase in temperature above 160°F.</p> <p>Reactives, ignitable solids, and ignitable liquids must be stored in Rooms 4, 5, or 6. There are no room restrictions for other waste types.</p>	<p>4,620 Gal.</p> <p>Maximum container size is: See column “Capacity of Containment System.” Max. capacity in each room = 770 gal. (~14 55-gal. drums).</p>	30 Feet	Map #10 shows the plot plan of Area I. Waste is stored within Area I in two prefabricated metal buildings designed for storage of hazardous wastes. The manufacturer’s specifications for these buildings, and drawings including dimensions, are provided in Attachment VIII-1. Each building has three segregated rooms (~65 square feet each) for storage of up to 770 gal. each. Each room has a built-in 250-gal. sump which is leak-proof and provides sufficient capacity to contain a potential spill or leak for more than 1 hour and until the spill or leak is detected and pumped out. In addition, containerized waste may be stored on pallets with built-in sumps in Area I. The two buildings and the safety pallets are situated on the site’s asphalt surface which is sloped toward the center of the site.	The design of the two metal storage buildings promotes drainage of potential spills and prevents contact between stored containers and standing liquid. The built-in sump in each room is located below the floor and has sufficient capacity to contain spills without overflow, for more than 1 hour. When detected, spilled liquid is pumped out of the sump immediately to a designated container for analysis and treatment.	250 gal. per room. Secondary containment calculations are included in Attachment VIII-1. The maximum volume stored in a room must not exceed the requirement that secondary containment must hold 10% of the total volume stored or 100% of the volume of the largest container. In addition, the sump in the room designated for storage of PCBs has a capacity sufficient to contain 25% of the total volume of drums stored.	Run-on cannot enter the storage space within the buildings in Area I because the buildings are sealed and leak proof. The doors are elevated from the ground surface, open to the outside, and are kept closed except during loading and unloading operations, routine inspections, and cleaning.	<p>Accumulated liquids in the building sumps in Area I are immediately pumped out to a designated container.</p> <p>The resulting liquid may be analyzed for:</p> <ul style="list-style-type: none"> • Determining on-site treatment • Off-site management. • Discharged to the effluent treatment system, to ensure compliance with hazardous waste regulations and the Refinery’s NPDES permit. <p>See the HWTSF Storm Drain System described below.</p>
II – Neutralization Area	Corrosive Liquids	This 1144-square foot area is located at the southwest corner of the site and consists of one 22-foot wide by 52-foot long reinforced concrete vault. Two separate drainage sumps located in this area transfer surface flow from the vault to the main sump. The Neutralization Area is used to treat and store corrosive liquids in polyethylene vessels. For vessel details and specifications refer to Section V. Waste Management Equipment. Area II may contain a combination of	<p>13,800 Gal.</p> <p>Maximum capacity of a single Polyethylene Vessel will be a nominal capacity of 6900 gal.</p>	34 Feet	Map #10 shows the plot plan for Area II. This area consists of a 45-foot by 20-foot unlined reinforced concrete pad. The concrete provides an impervious containment surface under the vessels. A 16"to18" berm concrete curb, moveable steel gate, and two sumps provide containment for the volume of largest vessel plus run-off and/or run-on. The two concrete sumps have steel grates flush with the concrete pad to allow entry of liquids. They are designed with manual valves which prohibit accumulated liquids from discharging to the HWTSF main sump until determined that it is safe to do so.	The concrete pad in Area II is sloped to drain toward the two sumps which collect spilled liquids. This promotes drainage and prevents contact between the two polyethylene vessels and standing liquid.	Secondary containment calculations for Areas II, III and V are provided in Attachment VIII-2. The calculations show that the sumps and curb and gate in Area II provide sufficient capacity to contain potential spills and rainwater run-off from this area. The calculations also show that the HWTSF general containment system provides sufficient capacity to contain potential	The concrete curb surrounding the HWTSF prevents run-on from entering the HWTSF. In Area II, the existing sumps, 16"-18" concrete curb, and steel gate prevent run-on from entering the area.	The sumps in Area II may be discharged to the HWTSF main sump only if the sump is empty. This avoids potential incompatible reactions. The Area II sumps are discharged as soon as possible in order to avoid overflow of the Area II containment system. Liquids in the HWTSF main sump are then sampled and analyzed prior to discharge to the Refinery’s effluent treatment

Table VIII-2 – Descriptions of Areas I–V

- For Each Area, a Description of:
 - Types of Wastes Allowed,
 - Waste Capacities, and
 - Secondary Containment

Area	Types of Waste Allowed	General Description	Max. Waste Capacity	Min. Space Between Next Closest Area(s)	Method of Secondary Containment	Drainage Promotion	Capacity of Containment System	Run-on Prevention	Liquid Analysis and Overflow Prevention
		up to two 6500 6900 gallon Polyethylene Vessels.					spills and rainwater run-off from Areas III, IV and V and the rest of the site, excluding Area II.		system. See the HWTSE Storm Drain System described below.
III – Bulk Liquids Storage and Treatment Area (Liquids Storage and Metals Precipitation)	<ul style="list-style-type: none"> • Liquids, Non-Corrosive pH Must Be >2 and <12.5. • Liquid Sulfidic Wastes to be Oxidized • Liquid Wastes to be Treated by: <ul style="list-style-type: none"> – Metals Precipitation, and/or – Flocculation, and/or – Sedimentation 	<p>This 3555-square foot area is located at the northwest corner of the site and is used to store and treat liquid waste. Storage and treatment takes place in steel vessels. Treatment processes that may be used in this area include oxidation of sulfidic wastes, metals precipitation, precipitation, flocculation, sedimentation, and sparging/stripping.</p> <p>Area III may contain a combination of up to seven vapor tight 21,000 gallon vessels. It is also allowed to store (but not treat) waste and container types allowed to be stored in Area I, not including PCBs, reactives, ignitable solids, and ignitable liquids. Containers must be stored on pallets with built-in sumps. It must be assured that all wastes stored/treated within this area are compatible. For vessel and container details and specifications refer to Section V. Waste Management Equipment.</p>	<p>147,000 Gal.</p> <p>Maximum capacity of a single Carbon Steel Vessel will be a nominal capacity of 21,000 gal.</p>	60 Feet	Map #11 shows the plot plan for Area III. This 90-foot by 39.5-foot area consists of a 3-inch asphalt pad underlain by a 100 mil geomembrane liner. This lining minimizes the potential for surface cracking and migration of possible spilled liquids to the subsurface soils. A sealed concrete curb measuring from 4 to 6 inches in height surrounds the area on three sides. A 2.12-foot deep, 88-foot long trench drain runs along the south side of the asphalt pad to collect small spills and rainwater run-off, and transfer it to the main sump. Secondary containment for this area is provided by the HWTSE General Containment System described below.	The asphalt pad in Area III is sloped to drain spilled liquids and rainfall run-off toward the Area III trench drain and the storm drain line in the center of the site. This promotes drainage and prevents contact between the vessels and standing liquid.	Secondary containment calculations for Areas II, III and V are provided in Attachment VIII-2. The calculations also show that the HWTSE general containment system provides sufficient capacity to contain potential spills and rainwater run-off from Areas III, IV and V and the rest of the site, excluding Area II.	The concrete curb surrounding the HWTSE prevents run-on from entering the HWTSE and Areas III and V.	See the HWTSE Storm Drain System described below.
IV- Solid Waste Bin Storage (Solid Waste Storage and Treatment)	<ul style="list-style-type: none"> • Solid Wastes • Solid Corrosive Wastes • Materials to be Stabilized 	<p>This area, located in the east-central area of the site, consists of 4482 square feet and is used to store and treat solid wastes, in bins. Treatment processes that are used include oxidation of materials with ignitable/flammable/pyrophoric/self-heating properties, stabilization of semi-solid waste, neutralization of corrosive solids, and sparging/stripping.</p> <p>It is also allowed to store (but not treat) waste and container types allowed to be stored in Area I, not including PCBs, reactives, ignitable solids, and ignitable liquids. Containers must be stored on pallets with built-in sumps. It must be assured that all wastes</p>	<p>405 yd³</p> <p>10 40-yd³ bins plus two 2.5-yd³ storage bins</p> <p>or</p> <p>20 20-yd³ bins plus two 2.5-yd³ storage bins.</p> <p>or</p> <p>other size bulk solids containers within max limits.</p>	30 Feet	Map #12 shows the plot plan for Area IV. This area consists of a reinforced concrete pad with a 100 mil polyplex liner. This pad was installed to prevent settling and breach of the surface material. The pad is compatible with all waste materials stored in this area. In general, only solid wastes are stored in this area. However, catalyst quench water may be added to a bin to stabilize or oxidize the contents. In these cases, ~10% of a bin would be liquid. Any spilled liquid is immediately contained and cleaned up. Run-off leaving this area is handled by the HWTSE Storm Drain system described below. Secondary containment for this area is provided by the HWTSE General Containment System described below.	The base of the effective storage space for bins and other bulk solids containers is elevated from the concrete pad surface by ~1 foot. Therefore, there is no potential for contact of the solid wastes stored and rainfall run-off. The concrete pad underlying the Area IV is sloped to drain north to the storm drain inlets at the center of the site.	218,049 Gal. Secondary containment calculations are given in Attachment VIII-2. The HWTSE's Storm Drain System, described below, is adequate to contain the maximum amount of liquids which could be in this area at any given time. In addition, adequate capacity is available to contain precipitation from a 24-hour, 25-year storm entering Area IV.	Run-on entering Area IV does not come into contact with solid wastes. Bins are elevated from the ground surface by ~1 foot. The precipitation from a 24-hour, 25-year storm would create a surface water depth of 3-1/2 inches. This depth was calculated based on historical mean annual precipitation data for the area.	See the HWTSE Storm Drain System described below.

Table VIII-2 – Descriptions of Areas I–V

- For Each Area, a Description of:
 - Types of Wastes Allowed,
 - Waste Capacities, and
 - Secondary Containment

Area	Types of Waste Allowed	General Description	Max. Waste Capacity	Min. Space Between Next Closest Area(s)	Method of Secondary Containment	Drainage Promotion	Capacity of Containment System	Run-on Prevention	Liquid Analysis and Overflow Prevention
		stored/treated within this area are compatible.	The maximum container size is 40 yd ³ .						
V- Liquid/Sludge Storage and Treatment (Liquids/Semi-Solids Storage and Treatment)	<ul style="list-style-type: none"> • Liquids, Non-Corrosive pH Must Be >2 and <12.5. • Semi-Solids • Materials to be: <ul style="list-style-type: none"> – Deliquified – Volume Reduced – Filtered – Phase Separated 	<p>This 5022 square foot area, located in the west-central area of the site, is used to store and treat liquid wastes. The treatment processes that may be used in this area are volume reduction, deliquification and sparging/stripping.</p> <p>Area V may contain a combination of up to ten vapor tight 21,000 gallon vessels. It is also allowed to store (but not treat) waste and container types allowed to be stored in Area I, not including PCBs, reactives, ignitable solids, and ignitable liquids. Containers must be stored on pallets with built-in sumps. It must be assured that all wastes stored/treated within this area are compatible. For vessel and container details and specifications refer to Section V. Waste Management Equipment.</p>	<p>210,000 Gal.</p> <p>Maximum capacity of a single Steel Vessel will be a nominal capacity of 21,000 gal.</p>	30 Feet	<p>Map #12 shows the plot plan for Area V. The containment system for Area V includes a reinforced concrete pad with a 100 mil polyplex liner. This lining minimizes the potential for surface cracking and migration of liquids to the subsurface soils. Secondary containment for this area is provided by the HWTSF General Containment System described below.</p> <p>The storm drain along the north side of the area collects run-off and small potential spills and discharges to the HWTSF Main sump.</p> <p>Run-off leaving this area is handled by the HWTSF Storm Drain system described below.</p>	The concrete pad in Area V is sloped to drain spilled liquids and rainfall run-off north toward the HWTSF's storm drain line in the center of the site. This promotes drainage and prevents contact between the vessels and standing liquid.	Secondary containment calculations for Areas II, III, and V are provided in Attachment VIII-2. The calculations show that the HWTSF general containment system provides sufficient capacity to contain potential spills and rainwater run-off from Areas III, IV, and V and the rest of the site, excluding Area II.	The concrete curb surrounding the HWTSF prevents run-on from entering the HWTSF and Areas III and V.	See the HWTSF Storm Drain System described below.
Laboratory Building		Fresh air is supplied by the ventilation systems.	Not Applicable	20 Feet	Secondary containment for this area is provided by the HWTSF General Containment System described below. Run-off leaving this area is handled by the HWTSF Storm Drain system described below.	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Decontamination Trailer		Fresh air is supplied by the ventilation systems.	Not Applicable	20 Feet	Secondary containment for this area is provided by the HWTSF General Containment System described below. Run-off leaving this area is handled by the HWTSF Storm Drain system described below.	Not Applicable	Not Applicable	Not Applicable	Not Applicable
HWTSF General Containment System		<p>The site consists of an asphalt pad underlain by a 4-inch sub-base. Due to overlaying, the pad itself is at least 4 inches thick. Because the continuity and integrity of the asphalt surface is not compromised by cracks, deep indentations, or excessive wear of the surface, the asphalt surface is judged to be suitable containment. The asphalt is compatible with most of the hazardous wastes found at the HWTSF, with the exception of wastes in Areas I and II. Spills are removed from the asphalt surface immediately. The asphalt pavement is designed with a slope from the curb at the periphery of the site toward three storm drain inlets in the center. These drain inlets discharge into a 12 inch drain pipe which conveys stormwater to the HWTSF main sump at the west side of the HWTSF. The water flows freely by gravity and is normally non-contaminated rainwater. Contents of the main sump are discharged to the Refinery's effluent treatment system via two sump pumps.</p> <p>Containment of the HWTSF is maintained by a sealed concrete curb which surrounds the site, except at the southeast corner where an asphalt concrete dike acts in conjunction with the curb to provide containment. The concrete curb varies in height from 6 to 12 inches. The curb provides adequate containment for the 10% of total volume of Areas III, IV and V, plus run-off for the entire site (refer to Figure VI-4).</p>							
HWTSF Storm Drain System		<p>The HWTSF main sump is used to collect spills and rainwater run-off from the site in general and Areas II and V. Spills in these areas flow freely by gravity to this sump, where they will be analyzed to determine compliance with hazardous waste regulations and the Refinery's NPDES permit. If wastewater tests clean, it may be discharged via two HWTSF sump pumps to the effluent treatment system. If the amount of liquid exceeds the capacity of the HWTSF main sump, the wastewater is pumped immediately to a designated vessel for completion of sampling and analysis to determine proper management.</p>							

B. Sampling

The sampling methods and equipment to be used are those described in the EPA Document SW-846, Chapter 9; EPA 600/2-80-018 "Samplers and Sampling Procedures for Hazardous Waste Streams," 1980; or ASTM Methods as appropriate. General sampling equipment is as follows:

- Sludges - Coliwasa
- Bulk Liquids - Coliwasa or Weighted Bottle
- Bulk Solids - Grain Sampler or Auger

A detailed description of each type of equipment and its use is included in this chapter.

1. Sample Containers

The sample container material and volume are set by the waste type and laboratory requirements. The sample containers used will be of sufficient size to allow duplicate analyses and constructed of a material that will not affect the analyses. Usually, ½-liter to 2 liters of sample is required per analysis. The sample container material should be chosen for various waste following the guidelines in Table VII-3, Sample Containers by Waste Type. Wide mouth jars are easier with solids and sludges; narrow-mouth bottles are usually used for liquids. A 40-mL borosilicate glass vial with a Teflon septum lid is used for samples that will be analyzed for volatile organic compounds. Many plastic materials are suitable for most samples. However, EPA 600/2-80-018 suggests that "linear polyethylene offers the best combination of chemical resistance and low cost."

2. Sample Labels and Chain-of-Custody Forms

Samples should be labeled and a chain-of-custody form filled out immediately after filling the containers. Figures VIII-1 is an example of a typical sample label used at the HWTSE, Figure VIII-2 is a sample chain-of-custody form for on-site analysis, and Figure VIII-3 is a sample chain-of-custody form for samples to be sent off-site for analysis. Sample labels should be affixed to dry, clean containers using a waterproof marker or the completed label can be covered with clear cellophane tape to prevent smearing by water or organic liquids. It is often easier to complete, affix and cover the labels before filling the sample containers. Do this if the required information is known prior to taking the samples.

A sampler field logbook must be used when performing sampling duties. Field logbooks must be bound and include numbered, water resistant pages. All pertinent information regarding the sampling must be documented and written in ink. Notations should be made in a logbook fashion, noting the time and date of all entries. Typical entries should include the following:

- Date
- Time
- Samplers Name
- Container Number
- Sampling Equipment Used
- Material Sampled
- Discrete Sample Number

- Field Observations
- Parameters Requested
- Type of Analysis
- EOD Job Number

The chain-of-custody form must accompany the samples at all times. It should be signed and dated by each person who has responsibility and/or physical possession of the samples from the sampler to the laboratory analyst. The chemical analyses requests may be on the chain-of-custody form or on a separate chemical analysis request sheet. Sample labels may include the constituents to be analyzed.

3. Personal Protection/Sampling Safety Procedures

Personal protection must be considered for sampling consideration for sampling operations. Respirators, gloves, boots, eye protection, and cloth or Tyvek coveralls should be used for most sampling operations. Specific descriptions and use of personal protection equipment are provided in other sections of this permit.

4. Waste Sampling

a) Sludge and Bulk Liquid Sampling

The types of wastes stored in these containers are sludge and bulk liquids. Containers will be sampled from openings on the top of the containers.

A coliwasa may be used to sample containers through openings on top. If the liquid is very viscous ASTM Standard D 140-70 may be used to sample the liquid. Use a glass or plastic coliwasa or follow ASTM D 140-70, as appropriate for the waste. Detailed sampling procedures for the coliwasa follow. The procedures are from the document EPA-600-2-80-018.

Containers deeper than 5 feet should be sampled using a coliwasa with extensions or a weighted bottle sampler. The sampler construction materials should not be used in acidic wastes. Metal weights should be covered in plastic or other non-reactive coating. Metal chains and bottle holders may be used with non-corrosive inorganic or organic wastes. Variations on sampler design are shown in ASTM Methods D 270 and E300. One sample may be taken if the waste may separate by gravity. The sampling procedures listed below are those presented in EPA 600/2-80-018.

b) Bulk Solid Sampling

The types of wastes stored in the various containers described here are bulk solids. Waste corrosive liquids and PCB liquids are additional wastes that can be contained in these containers. For unknown wastes, or wastes with limited process knowledge available, 10% of all incoming containers (less than 55 gal.) will be sampled and tested to verify that the container contents matches the MFG 3131 and other generator supplied information. A simple random method will be used to choose the containers sampled. Containers will be sampled after they have been unloaded from trucks but before they are transferred to storage areas. Simple random sampling is used to sample wastes in 55-gal. drums. The number of drums sampled is based on the American Society for Testing and Materials (ASTM) cube root equation for barrels (see Figure VIII-4). Simple random sampling entails using a random numbers table to select drums to sample as shown in Figure VIII-5. These wastes are homogeneous and can be grab sampled at mid-level in the drum through the bung opening.

Containers including liquids will be sampled using a coliwasa. The coliwasa and its use were described previously.

Containers holding soil-like solids or crushed or powdered material will be sampled using an auger or grain sampler, or by following ASTM Standard D 346-75, ASTM Standard D 420-60, or ASTM Standard D 1452-65. A grain sampler is useful for dry granular or powdery wastes. A grain sampler is constructed of two slotted tubes, one inside the other. They are usually constructed of brass or stainless steel. The sampler is opened and closed by turning the inner tube so the slotted side is aligned or unaligned with the slotted side of the outer tube.

An auger is useful for moist or sticky solids with small particle sizes. The tip and edges of the open tube are sharpened to allow the trier to cut a core in the waste material. The auger is constructed of stainless steel with a metal handle. The tube is usually 18 to 24 inches long and 2 inches in diameter.

Bulk solids may be large quantities of solids with small particle size or fewer pieces of large size. Solids with small particle sizes will be sampled using a grain sampler or auger as are containerized solids. Generator information will be relied on for large hard solids because of the difficulty in on-site sampling and small quantity of this form of waste.

C. Sampling Procedures

Procedures for Use of Coliwasa

- 1) Choose the plastic or glass coliwasa for the liquid waste to be sampled and assemble the sampler.
- 2) Make sure that the sampler is clean.
- 3) Check to make sure the sampler is functioning properly.
- 4) Wear necessary protective clothing and gear and observe required sampling precautions.
- 5) Put the sampler in the open position.
- 6) Slowly lower the sampler into the liquid waste. Lower the sampler at a rate that permits the levels of the liquid inside and outside the sampler tube to be about the same. If the level of the liquid in the sampler tube is lower than that outside the sampler, the sampling rate is too fast and will result in a non-representative sample.
- 7) When the sampler hits the bottom of the waste container, pull the sampler tube up sharply to close the sampler.
- 8) Slowly withdraw the sampler from the waste container with one hand while wiping the sampler tube using a disposable cloth or rag with the other hand.
- 9) Carefully discharge the sample into the suitable sample container by slowly opening the sampler. This is done by slowly pushing while the lower end of the sampler is positioned in a sample container.

- 10) Cap the sample container, attach label, and complete the chain-of-custody record.

Procedures for Use of Weighted Bottle Sampler

- 1) Assemble the weighted bottle sampler.
- 2) Using protective gear, in turn, lower the sampler to the bottom of the container.
- 3) Pull out the bottle stopper with a sharp jerk of the sampler line.
- 4) Slowly lift the bottle with a constant speed allowing the bottle to fill completely, as evidenced by the cessation of air bubbles. Time the lift so that the bottle completes filling at top of liquid.
- 5) Raise the sampler and retrieve and cap the bottle. Wipe off the outside of the bottle with a terry towel or rag. The bottle can serve as the sample container.
- 6) Label each sample collected, affix label, fill out chain-of-custody form.
- 7) Clean on-site or store contaminated sampler in a plastic bag for subsequent cleaning.

Procedures for Use of a Thief

- 1) Choose a plastic or glass tube thief for the liquid waste to be sampled.
- 2) Make sure the tube and stopper are clean.
- 3) Wear necessary protective clothing and hear and observe required sampling precautions.
- 4) Slowly lower the sampler into the waste so that the liquid level inside and outside the tube are the same.
- 5) When the sampler hits the bottom of the container, tightly stopper the tube.
- 6) Slowly remove the sampler from the container with one hand while wiping the sampler tube using a clean disposable rag or cloth with the other hand.
- 7) Carefully discharge the sample into a suitable sample container by slowly loosening the stopper.
- 8) Collect eight core samples at different points, and combine the samples in the same container.
- 9) Cap the sample container, attach label, and complete the chain-of-custody form.
- 10) Clean or store the sample in plastic bag for subsequent cleaning.

Procedures for Use of a Auger

- 1) Wear protective gear. Insert the auger into the waste material at a 90° angle.
- 2) Rotate the auger to cut a core of material from top to bottom of the material.

- 3) Slowly withdraw the auger.
- 4) Transfer the sample into a stainless steel pail with the aid of a spatula.
- 5) Repeat the sampling at different points eight or more time and combine the samples in the same pail. Take the required sample from the pail.
- 6) Cap the sample container, attach the label and seal, and complete chain-of-custody form.
- 7) Clean the sampler after each sample.

Procedures for Use of a Grain Sampler

- 1) Wear protective gear. While the sampler is in the closed position, insert it into the granular or powdered waste being sampled from a point near a top edge or corner, through the center, and to a point diagonally opposite the point of entry.
- 2) Rotate the inner tube of the sampler into the open position.
- 3) Wiggle the sampler a few times to allow materials to enter the open slots.
- 4) Place the sampler in the closed position and withdraw from the material being sampled.
- 5) Place the sampler in a horizontal position with the slots facing upward.
- 6) Rotate and slide out the outer tube from the inner tube.
- 7) Transfer the collected sample in the inner tube into a suitable sample container.
- 8) Collect eight core samples at different points, and combine the samples in the same container.
- 9) Cap the sample container, attach label, and complete the chain-of-custody form.
- 10) Clean or store the sample in plastic bag for subsequent cleaning.

Table VIII-3**Sample Container Materials by Waste Type**

Waste Type	Container Material	Lid Material or Liner
Bulk Liquids or Sludges		
Organic	Glass	Teflon Lined
Volatile Organic	40 mL Glass Vial	Teflon Septum
Inorganic	Plastic*	Plastic
Acids (Except HF)	Glass	Teflon Lined
Strong Bases or Hydrofluoric Acid	Plastic*	Plastic
Bulk Solids	Glass	Teflon Lined

*Plastic may be polyethylene, PVC, polypropylene or Teflon.

Source: EPA 600/2-80-018

Figure VIII-1

Sample Label

ENVIRONMENTAL SAMPLING SUPPLY

SAMPLE # _____ DATE _____

CUSTOMER _____

SIGNATURE _____

3601 San Leandro Street, Oakland, California 94603
(415) 562-4388 (800) 233-8425

Figure VIII- 2 Sample In-House Chain-of-Custody Form



Chevron Environmental Laboratory
Chevron Products Company
940 Hensley Street
Richmond, CA 94801

Chain of Custody for HES Hazardous Waste Group Analysis Requests

Project:				Analysis Requested										Matrix: Wastewater			
Source: ABU:				All Effluent Drop Specs: Metals, Mercury, pH, Ammonia & Benzene Metals: Non-certified Effluent list SM3120B (modified) Mercury by EPA 245.1 pH by SM4500-H+B Ammonia by SM4500-NH3F Benzene by EPA 624 Other:										Safety Hazards or Special Comments Desired completion Date:			
Location of Material:																	
WBS Element or Cost Center: HW Job#:																	
HW Specialist Sample Requestor:																	
Report To HW Sampling Technician:																	
Sampler(s):																	
Sample Identification	Drum or Tank #	Date Collected	Time Collected	Grab	Comp	Acid added	# of Bottles										
				X													
				X													
				X													
				X													
				X													
Relinquished by:			Date	Time	Received by CEL:			Date	Time						Temperature Upon Arrival: °C		
Relinquished by:			Date	Time	Received by:			Date	Time						Received On Ice? Yes / No		
Project Notes:				Subcontracted to:										Containers in Good Condition? Yes / No Lit. Discrepancy:			

**Figure VIII-3
Sample Off Site Chain-of Custody Form**

Chevron Richmond Refinery HES/HW Workgroup - Analytical Request / Chain of Custody													
Lancaster Laboratories <small>Where quality is a science.</small>		For Lancaster Laboratories use only											
Project Name:		Source (Vessel & Plant Name)		Matrix		Analyses Requested <small>Preservative Codes</small>					Subcontract Analyses		
ABU:		HW Job #									<small>Preservative Codes</small> ☑= None S = H2SO4 N = HNO3 B = NaOH H = HCl O = Other		
Location of Material:		Company Code: 0061 Richmond Refinery									Listed Waste YES NO		
WBS Element or Cost Center:		Sample Requestor:									Comments/Hazards		
Sampler(s) Name:		State of Origin: CA									Other Remarks: 		
Sample Identification		Tank or Drum #	Date Collected	Time Collected	Grab	Composite	Solid <input type="checkbox"/>	Water <input type="checkbox"/>	Oil <input type="checkbox"/>	Other Liquid <input type="checkbox"/>			Total Number of Containers
				*Shipped by Chevron <input type="checkbox"/>		*Shipped by LLI <input type="checkbox"/>		as # _____ of Dangerous Goods Shipments					
Relinquished by		Date	Time	Received by		Date	Time	Desired Completion Date: _____ or					
Relinquished by		Date	Time	Received by		Date	Time	Turn Around Time (TAT) (Circle one) NOTE: Rush Surcharges apply 1 day for all requests less than 3 day 10 working days 5 day TAT Clock starts when received at LLI 10 day					
Relinquished by Commercial Carrier:		Date	Time	Received by		Date	Time						
Airborne	FedEx												
Temperature Upon Receipt _____ °C		Custody Seals Intact?		Yes	No								

Lancaster Laboratories, Inc., 2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 (717) 656-2300

Figure VIII-4

**Standard Methods of Sampling Bituminous Materials
[Designation: D 140 - 70 (Reapproved 1981)]**

This standard is issued under the fixed designation D 140; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) since the last revision or reapproval.

These methods have been approved for use by agencies of the Department of Defense and for listing in the DoD Index of Specifications and Standards.

12. Sampling from Drums or Barrels

12.1 After thorough mixing, samples of liquid bituminous material from barrels or drums shall be secured by tube or thief sampling by taking 1 qt (1 dm³) of material from packages selected at random according to Section 13.

13. Sampling Semisolid or Uncrushed Solid Material

13.1 *Drums, Barrels, Carton, and Bags* -- Where the lot of material to be sampled is obviously from a single run or batch of the producer, one package shall be selected at random and sampled as described below. Where the lot of material to be sampled is not obviously from a single run or batch of the producer, or where the single samples elected as described above fails on test to conform to the requirements of the specifications, a number of packages shall be selected at random equivalent to the cube root of the total number of packages in the lot. The following table is given, showing the number of samples to be selected for shipments of various sizes.

Packages in Shipment	Packages Selected
2 to 8	2
9 to 27	3
28 to 27	4
65 to 125	5
126 to 216	6
217 to 343	7
344 to 343	8
513 to 729	9
730 to 1000	10
1001 to 1331	11

Samples shall be taken from at least 3 in. (76 mm) below the surface and at least 3 in. from the side of the container. A clean hatchet may be used if the material is hard enough to shatter and a broad, stiff putty knife if the material is soft. When more than one package in a lot is sampled, each individual sample shall be not less than ¼-lb (0.1 kg) in weight. When the lot of material is obviously from a single run or batch of the producer, all samples from the lot shall be melted and thoroughly mixed, and an average 1-gal. (4-dm³) sample taken from the combined material for examination. In case more than a single run or batch of the producer is present and the batches can be clearly differentiated, a composite 1-gal. sample shall be prepared for examination from each batch. Where it is not possible to differentiate between the various batches, each sample shall be examined separately.

Source: ASTM Standards, Volume 04.03

Figure IV-5

Random Numbers Table

03	47	43	73	86	36	96	47	36	61	46	98	63	71	62
97	74	24	67	62	42	81	14	57	20	42	53	32	37	32
16	76	62	27	66	56	50	26	71	07	32	90	79	78	53
12	56	85	99	26	96	96	68	27	31	05	03	72	93	15
55	59	56	35	64	38	54	82	46	22	31	62	43	09	90
16	22	77	94	39	49	54	43	54	82	17	37	93	23	78
84	42	17	53	31	57	24	55	06	88	77	04	74	47	67
63	01	63	78	59	16	95	55	67	19	98	10	50	71	75
33	21	12	34	29	78	64	56	07	82	52	42	07	44	38
57	60	86	32	44	09	47	27	96	54	49	17	46	09	62
18	18	07	92	46	44	17	16	58	09	79	83	86	19	62
26	62	38	97	75	84	16	07	44	99	83	11	46	32	24
23	42	40	64	74	82	97	99	99	81	07	45	32	14	08
52	36	28	19	95	50	92	26	11	97	00	56	76	31	38
37	85	94	35	12	83	39	50	08	30	42	34	07	96	88
70	29	17	12	13	40	33	20	38	26	13	89	51	03	74
56	62	18	37	35	96	83	50	87	75	97	12	25	93	47
99	49	57	22	77	88	42	95	45	72	16	64	36	16	00
16	08	15	04	72	33	27	14	34	09	45	59	34	68	49
31	16	93	32	43	50	27	89	87	19	20	15	37	00	49

Attachment VIII-1

Manufacturer's Specifications and Drawings for Area I Storage Buildings and Safety Pallets

4 Drawings Provided by Safety Storage, Inc.

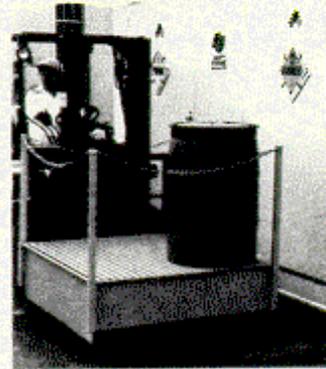
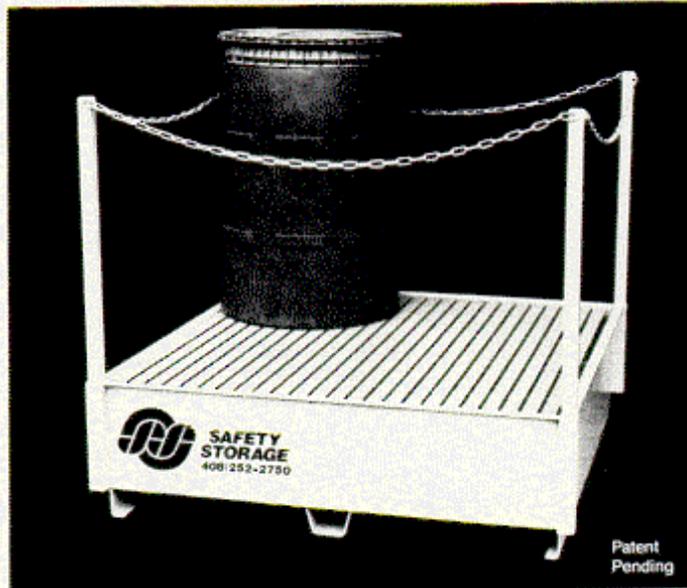
- 1) Additional Dry Chemical Protection and Standard Sprinkler Protection
- 2) Model No. 22, 15, 7, Explosion Resistant Standard Details
- 3) Model No. 22, Explosion Relief Chemical Storage Container
- 4) D-ESYS-1-488 – Electrical System and Ansul Dry Chemical Fire Suppression System for Building Models 7, 15, 22

Attachment VIII-1

SPILL CONTAINMENT PALLET

SAFE-T-PALLET
For chemicals and hazardous materials

SAFETY STORAGE™ Spill Containment Pallets have been carefully designed and constructed to comply with current regulatory agency requirements, environmental regulations, and local ordinances covering the storage of hazardous materials.



Construction Features

- Safety Storage Spill Containment Pallets are specifically designed for hazardous materials storage and handling applications
- Accommodates up to four 55-gallon drums
- 106 gallon secondary spill containment capacity
- Pallets are constructed of 7 gauge ASTM-A36 sheet steel and ASTM-A36 tubing for maximum structural strength
- Interior and exterior surfaces are coated with a chemical-resistant paint
- Fiberglass floor grating

- Lift-off floor grating panels provide access to sump area
- A static grounding connection is provided on each unit to protect flammable/combustible liquids from ignition by electrical discharge
- Forklift pockets permit easy handling
- One year warranty
- Physical dimensions: 52 1/2" W x 52" D x 15 3/8" H**
- Weight: 475 lbs
- Options: Castor assemblies, Side rails and safety chains

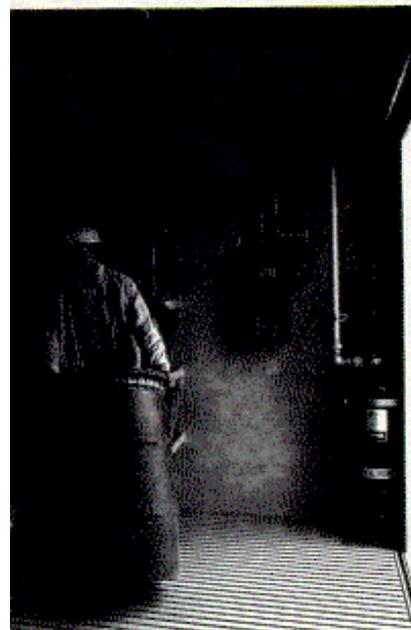


SAFETY STORAGE™

SAFETY STORAGE, INC.
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Campbell, CA 95008
Phone: 408/559-3901
Fax: 408/559-3218
1-800/344-6539

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SS-105 Printed in U.S.A. 7/89

Attachment VIII-1



SAFETY STORAGE

Nationwide Manufacturer of Prefabricated Chemical and Hazardous Material Storage Buildings

Businesses and institutions must comply with federal, state, and local regulations, minimize liability, safeguard personnel and facilities, and keep our communities safe from hazardous waste and toxic chemicals.

Safety Storage buildings offer a comprehensive response to compliance requirements. Because they're from a company experienced in—and dedicated to—solving chemical and hazardous material challenges. A company with a network of field engineers who understand the complexities of compliance regulations. Backed by many years of manufacturing know-how and plants on both U.S. coasts, they're people able to tailor precise solutions to your storage requirements.

Safety Storage relocatable weather-proof buildings are proven throughout the country, in all climates and with virtually every hazardous material. They

demonstrate what no others can—solid environmental and chemical engineering know-how. Hazardous chemical and material handling, storage, and transportation is our only business. We know our business. And that's made us first choice among people who know theirs.

Our staff of professional field engineers are available nationwide for informative presentations on regulation compliance strategies and alternatives.

Safety Storage sales representatives, located in most U.S. industrial communities, are trained to help you attain safe hazardous material storage objectives. They will assess your chemical storage needs, prepare detailed storage-unit sketches and specifications, and provide written price quotations. Call today for the name of the representative nearest you.

Model	Outside Dimensions			Inside Dimensions			Tare Weight* (Lbs.)	Door Openings		Designed Storage Capacity			Sump Capacity (Gallons)	
	Length	Width	Height	Length	Width	Height		Height	Width	Weight (Lbs.)	Sq. Ft.	Drums		Pallets
22	22' 8"	9'	8' 7 1/2"	21' 11 3/4"	8' 3/8"	7' 1/2"	8,600	6' 9 3/4"	4' 6"	44,000	176	44	6	750
15	15' 3 1/2"	9'	8' 7 1/2"	14' 7 1/2"	8' 3/8"	7' 1/2"	6,000	6' 9 3/4"	4' 6"	29,250	117	28	4	500
7	8' 1/4"	9'	8' 7 1/2"	7' 3 1/2"	8' 3/8"	7' 1/2"	3,400	6' 9 3/4"	4' 6"	14,500	58	12	2	250
44FR	23' 2"	9' 3"	8' 9"	21' 11"	8'	7' 4"	14,500	6' 7 3/8"	4' 10 3/4"	44,000	176	44	6	750
30FR	15' 10"	9' 3"	8' 9"	14' 7"	8'	7' 4"	10,500	6' 7 3/8"	4' 10 3/4"	29,250	117	28	4	500
14FR	8' 6"	9' 3"	8' 9"	7' 3"	8'	7' 4"	6,500	6' 7 3/8"	4' 10 3/4"	14,500	58	12	2	250



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Attachment VIII-2

Secondary Containment Calculations

Attachment VIII-2

The attached calculations were revised (from the previous version stamped on November 1, 2004) by Scott D Newell PE and Thomas E Farr PE to incorporate changes in portable containment vessel capacities in Area II. These changes are based on a more typical nominal storage capacity for commercially available large portable polyethylene tanks. The following calculations are correct and accurately represent the existing secondary containment capacity of the following areas.

Area I	Drum Storage Buildings
Area II	Neutralization Area
Area III	Bulk Liquids Storage and Treatment
Area IV	Solids Waste Bin Storage
Area V	Bulk Liquids/Sludge Storage and Treatment

Recalculated by: Scott D Newell PE

Checked by: Thomas E Farr PE
Engineer of Record



Attachment VIII-2

Area I – Storage for Drummed Waste

• Drum Storage of Hazardous Wastes

Typical Building Type: Safety Storage, Inc., Model 22

Sump Capacity for One of Three Rooms = 250 Gal. (See Manufacturer's Specifications in Attachment VIII-1)

- 1) Required Secondary Containment Capacity for Storage of Hazardous Wastes = 10% Total Volume or Volume of Largest Container, Whichever is Greater (Precipitation Not a Factor in a Covered Building)
 - a) Maximum Storage in One Room = Fourteen 55-Gal. Drums
10% (14 X 55) = 77 Gal.
or
Largest Container Volume = 55 Gal.
 - Use 77 Gal.
- 2) Available Secondary Containment Capacity for One Room (Above) = 250 Gal.
- 3) Sump Capacity is Adequate: 250 Gal. > 77 Gal.

• Drum Storage of PCBs

- 1) Required Secondary Containment Capacity for Storage of Hazardous Wastes = 25% Total Volume (40 CFR, §761)
 - a) Maximum Storage in One Room = Fourteen 55-Gal. Drums
25% (14 x 55) = 192.5 Gal.
- 2) Available Secondary Containment Capacity for One Room (Above) = 250 Gal.
- 3) Sump Capacity is Adequate: 250 Gal. > 192.5 Gal.

• Storage of Hazardous Wastes on Pallets

Typical Pallet Type: Safety Storage, Inc., Saf-T-Pallet With Built-In Sump (52-1/2" x 52" x 15-3/8")

Sump Capacity = 106 Gal. = 14.17 Ft³ (See Manufacturer's Specifications in Attachment VIII-1)

- 1) Required Secondary Containment Capacity for Storage of Hazardous Wastes = 10% Total Volume or Volume of Largest Container, Whichever is Greater Plus Runoff From a 25-Year, 24-Hour Storm Event
 - a) Maximum Storage on One Pallet = Four 55-Gal. Drums
10% (4 x 55) = 22 Gal.
or
Largest Container Volume = 55 Gal.

Attachment VIII-2

- Use 55 Gal.

b) Runoff: $52\text{-}1/2'' \times 52'' \times 3.5'' = 9555 \text{ In.}^3 = 5.53 \text{ Ft}^3$

Total Required Containment = $55 \text{ Gal.}/7.48 + 5.53 = 12.88 \text{ Ft}^3$

2) Available Secondary Containment Capacity (Above) = 14.17 Ft^3

3) Sump Capacity is Adequate: $14.17 \text{ Ft}^3 > 12.88 \text{ Ft}^3$

- **Storage of Transformers Containing PCBs on Pallets**

Typical Pallet Type: Safety Storage, Inc., Saf-T-Pallet With Built-In Sump (52-1/2'' x 52'' x 15-3/8'')
Sump Capacity = 106 Gal. = 14.17 Ft^3 (See Manufacturer's Specifications in Attachment VIII-1)

1) Required Secondary Containment Capacity for Storage of Items Containing PCBs = 25% Total Volume Plus Runoff From a 25-Year, 24-Hour Storm Event. (40 CFR, §761)

a) Maximum Storage On One Pallet = One Transformer Containing 250 Gal Oil* 25% (250) = (62.5 Gal.)

b) Runoff: $52\text{-}1/2'' \times 52'' \times 3.5'' = 9555 \text{ In.}^3 = 5.53 \text{ Ft}^3$

Total Required Containment = $62.5 \text{ Gal.}/7.48 + 5.53 = 13.88 \text{ Ft}^3$

2) Available Secondary Containment Capacity (Above) = 14.17 Ft^3

3) Sump Capacity is Adequate: $14.17 \text{ Ft}^3 > 13.88 \text{ Ft}^3$

*Note that transformers of up to 500 gal. may be stored in the HWTSF; when this is the case, pallets with a sump capacity of at least 200 gal. shall be used:

Sump Capacity = 200 Gal. = 26.74 Ft^3

Required Containment = $25\%(500 \text{ Gal.})/7.48 + 10^{**} = 26.70 \text{ Ft}^3$

Sump Capacity Would Be Adequate: $26.74 \text{ Ft}^3 > 26.70 \text{ Ft}^3$

**Note that since exact sump dimensions are unknown, it is estimated that the runoff from a 25-year, 24-hour storm which would be accumulated in the pallet sump would double.

Attachment VIII-2

Area II - Neutralization Area

- Two 6900-Gal. Polyethylene Vessels

Gross Containment Storage Volume

- | | |
|---|---------------------------|
| 1. Two Sumps (Assume With 1" Water) | 419.90 Cubic Feet |
| 2. Wedges From Top of Sump to Low Point of Curb | <u>1413.32 Cubic Feet</u> |

Total Gross Storage Volume = 13,712 Gallons = 1833.22 Cubic Feet

Containment Volume Reductions

- | | |
|--|-------------------------|
| 1. Piping, Valves, and Accessories | 5.00 Cubic Feet |
| 2. Grating | 2.00 Cubic Feet |
| 3. Two Tank Bases (4" High) | 52.33 Cubic Feet |
| 4. Tank Volume Reduction (Not Leading) | <u>47.95 Cubic Feet</u> |

Total Volume Reduction = 802 Gallons = 107.28 Cubic Feet

Required Containment Storage			
Rainfall	Storm Volume, Gallons	Tank Volume, Gallons*	Total Required Storage, Gallons
3.5"	2317	6900	9217
4.6"	3045	6900	9945

Available Freeboard			
Rainfall	Required Storage, Gallons	Storage Available, Gallons	Freeboard
3.5"	9217	12,910	5.59"
4.6"	9945	12,910	4.49"

Attachment VIII-2

Area III and Area V - Bulk Liquid Storage/Treatment Area

- Seven 21,000-Gal. Steel Vapor Tight Vessels (Area III)
- Ten 21,000- Gal Steel Vapor Tight Vessels (Area V)

1) Required Secondary Containment Capacity for Storage of Hazardous Wastes = 10% Total Volume or Volume of Largest Container, Whichever is Greater, Plus Runoff From a 25-Year, 24-Hour Storm Event

a) Volume of the Largest Vessel = 21,000 Gal. = 2807 Ft³

$$10\% \text{ of Total Volume} = 10\% [(17 \times 21000)] / 7.48 = 4773 \text{ Ft}^3$$

$$4773 > 2807; \text{ Use } 4773 \text{ Ft}^3$$

b) 25-Year, 24-Hour Storm Event

$$(\text{Total Site} - \text{Area II}) \times 3.5/12$$

$$\text{Total Site} = \text{A} + \text{B} + \text{C} + \text{D} + \text{E} + \text{F} + \text{G} + \text{H} + \text{I} + \text{J}$$

$$= 1/2(195+175)18 - 4 \times 53 + 90 \times 195 + 1/2(195+197)45 \\ + 197 \times 37 + 4 \times 180.5 + 1/2(2.5+5.5)4 + 174 \times 40 \\ + 1/2(29+36)161 + 1/2(113.5+111)38$$

$$= 3330 - 212 + 17550 + 8820 + 7289 + 722 + 16 + 6960 + 5233 + 4266$$

$$= 53,974 \text{ Ft}^2$$

$$\text{Now Total Rainfall} = (53974 - 1144) \times 3.5/12 = 15,409 \text{ Ft}^3$$

2) Required Secondary Containment Capacity for Areas III and V:

$$= 4773 + 15409 = 20,182 \text{ Ft}^3$$

3) Available Secondary Containment Capacity:

$$= (\text{Total Site Capacity} - \text{Area II}) \times 6/12 + \text{Area III Trench} + \text{Sump} + \text{Piping}$$

$$= (53974 - 1144) \times 6/12 + 88 \times 3 \times 2.12 + 1.5 \times 2.0 \times 2.12 \\ + 2270 + (\pi(8/12)^2)/4 \times 66 + (\pi(10/12)^2)/4 \times 230$$

$$= 26415 + 560 + 6 + 2270 + 23 + 125 = 29,399 \text{ Ft}^3$$

$$29,399 \text{ Ft}^3 > 20182 \text{ Ft}^3$$

Therefore existing secondary containment capacity is adequate for Areas III and V and the runoff for the entire HWTSE, excluding Area II, which is self-contained.

Attachment VIII-2**Area IV - Solid Waste Bin Storage Area**

- **20 – 20 E.Y. Bins Which May Contain 10% Liquid Catalyst Quench Water Each**

Max. Capacity of Liquids at Any Given Time Would Be:

$$10\% (20 \times 20) = 40 \text{ Yd}^3 \times 27 = 1080 \text{ Ft}^3$$

If this capacity was added to the required capacity for Areas III and V combined (above):

$$1080 + 4773 = 5853 \text{ Ft}^3$$

Add this to runoff capacity for entire site (above, includes Area IV):

$$5853 + 15,409 = 21,262 \text{ Ft}^3$$

Therefore, existing secondary containment for the entire site is also adequate to provide containment for Area IV:

$$29,399 \text{ Ft}^3 > 21$$

Attachment VIII-3

Testing Procedure for Compatibility

The testing procedure for compatibility (performed “in-house”) will confirm that the subject waste streams cannot react with each other in the following ways:

- Violently (fire, explosion or a vigorous boiling or spattering reaction).
- With release of any kind of gas.
- With evolution of substantial amounts of heat.
- To produce a precipitate.
- To polymerize.

The testing scheme involves a series of quick and simple laboratory tests, as described in the following section:

The tests have to be prepared in a fume hood as the tests may release toxic gases or the wastes may react violently involving splashing, splattering, or ignition. Appropriate gloves and safety goggles for personal protection must be work to minimize hazards associated with the compatibility tests.

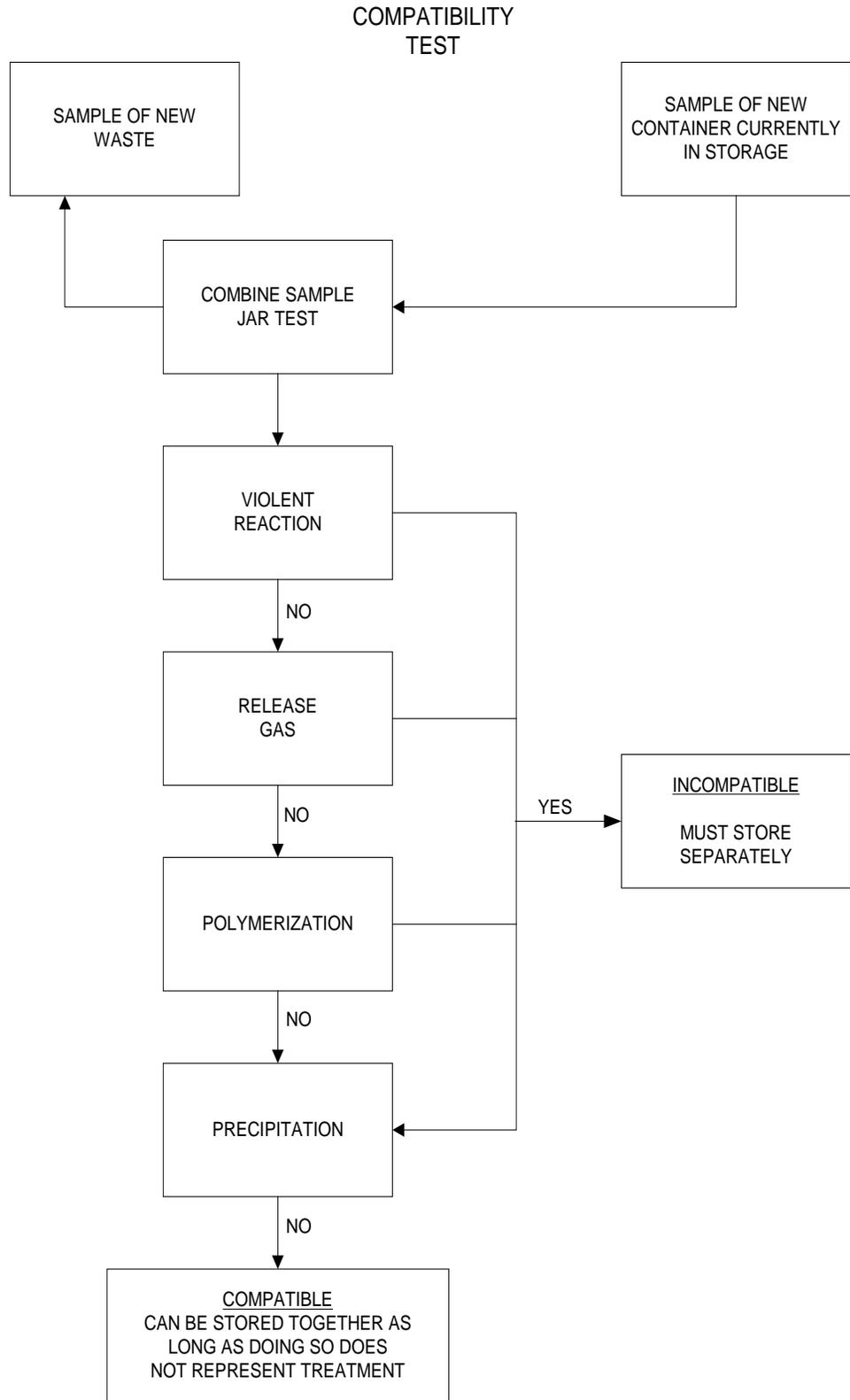
Place about 200 mL of the waste into a 500 mL beaker. Carefully add a few drops of the new waste sample. If no immediate reaction occurs, add about 200 mL of new waste to the beaker, mix well, and observe for the following parameters:

- Release of any kind of gas as indicated by bubbling of beaker contents,
- Generation of heat, (use calorimetric procedures), or
- Precipitation of solid or semi-solid materials.

Polymerization of beaker content. Usually a polymerization is accompanied by generation of heat and production of a solid or semi-solid compound. In other cases, a polymerization is indicated by a change of the viscosity of the substance.

The observation for possible chemical reactions resulting from incompatibilities between the two wastes should therefore last at least half an hour as some chemical reactions are very slow or the reaction occurs after an initial lag period. If any of the above reactions appear positive, the two wastes are incompatible and must be stored in different holding vessels/containers.

Attachment VIII-2



IX. Treatment Procedures

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- C. Oxidation of Wastes With Ignitable/Flammable/Pyrophoric/Self-Heating Properties
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- Figure IX-1 Treatment Flowchart for Treatment of Waste
- Figure IX-2 Diagram of Neutralization of Waste Corrosive Liquids (Acids and Bases)
- Figure IX-3 Oxidation of Sulfidic Wastes
- Figure IX-4 Diagram for Dewatering of Sludges in a Plate and Frame Unit

IX. Treatment Procedures

Each treatment is described in general, followed by typical detailed procedures.

Treatment practices at the HWTSF which may be performed on hazardous waste and the maximum treatment quantities allowed per day are:

Neutralization and pH Adjustment	21,000 Gal./Day
Oxidation of Sulfidic Wastes	21,000 Gal./Day
Oxidation of Ignitable/Flammable/Pyrophoric/Self-Heating Material	16,200 Gal./Day
Reduction, Precipitation, Flocculation, and Sedimentation	63,000 Gal./Day
Stabilization	8,100 Gal./Day
Deliquescence, Filtration, and Phase Separation	42,000 Gal./Day
Sparging, Stripping	21,000 Gal./Day

All wastes must meet land disposal treatment standards before being landfilled. This will be accomplished either through on-site or off-site treatment. See Figures XII-1, XII-2, and XII-3 for typical examples of the Chevron on-site, EPA, and California Land Disposal Notifications and Certification Forms. These forms are used whenever a waste is received or shipped from the HWTSF.

The Figure IX-1 provides an example of the thought process for treatment of wastes.

A. Neutralization and pH Adjustment

See Figure IX-2 for a typical neutralization process diagram.

1. Neutralization (pH Adjustment) of Liquids

The neutralization of waste corrosive liquids at the HWTSF takes place in polyethylene vessels in Area II. Waste is generally neutralized to:

- Destroy or reduce the inherent hazardous nature of acidic and basic wastes.
- Render the waste mixture more amendable to subsequent treatments; i.e., destruction of sulfides, precipitation of certain metals.

Typical Detailed Procedures for Neutralization and pH Adjustment of Acidic Liquids

- 1) Conduct a bench-scale test to determine the reagent requirements for the neutralization of a known quantity of waste acids.
- 2) Choose the neutralizing reagent depending upon post treatment disposal method (i.e., recycling, regeneration, effluent system, etc.). Determine whether odor control is necessary.
- 3) Set up equipment per Figure IX-2.
- 4) Start air-agitating the solution.

- 5) Begin chemical addition in accordance with parameters established by bench scale testing. Test for pH change at regular intervals until a pH of 6-11 is reached. If bench-scale tests determine that this reaction is exothermic, it will be necessary to monitor the temperature of this reaction as it progresses and halt the chemical addition if the temperature exceeds 150°F.
- 6) When the target pH is attained, stop the chemical addition and continue air agitation 1 hour to ensure that the pH is stable.
- 7) Take a sample of the neutralized material for analysis.
- 8) Wastewater generated from neutralization may be managed as follows:
 - a) If it is to be discharged to the effluent treatment system, it is first analyzed to ensure compliance with hazardous waste regulations and the Refinery's NPDES permit. This is usually done by discharging the wastewater to the HWTSF main sump with mobile pumps and flexible hoses. The contents of the main sump are discharged to the Refinery's effluent treatment system.
 - b) Wastewater may be additionally treated as allowed by this Section.

Typical Detailed Procedures for Neutralization and pH Adjustment of Basic Liquids

- 1) Conduct a bench-scale test to determine the reagent requirements for the neutralization of a known quantity of waste basic liquid.
- 2) Choose the neutralizing reagent depending upon post treatment disposal method (i.e., recycling, regeneration, effluent system, etc.). Determine whether odor control is necessary.
- 3) Set up equipment per Figure IX-2.
- 4) Start air-agitating the solution.
- 5) Begin chemical addition in accordance with parameters established by bench scale testing. Test for pH change at regular intervals until a pH of 6-11 is reached. If bench-scale tests determine that this reaction is exothermic, it will be necessary to monitor the temperature of this reaction as it progresses and halt the chemical addition if the temperature exceeds 150°F.
- 6) When the target pH is attained, stop the chemical addition and continue air agitation 1 hour to ensure that the pH is stable.
- 7) Take a sample of the neutralized material for analysis.
- 8) Wastewater generated from neutralization may be managed as described in A1-8) above.

2. Neutralization (pH Adjustment) of Solids

Neutralization of waste corrosive solids takes place in bins in Area IV. Corrosive solids are generally neutralized to:

- Render the waste non-hazardous or less hazardous.
- Meet Land Disposal Restriction treatment standards.

Typical Detailed Procedures for Neutralization and pH Adjustment of Acidic Solids

- 1) Conduct a bench-scale test to determine the reagent requirements to neutralize a known volume of waste solids (lime is typically used for this process).
- 2) Determine whether odor control is necessary.
- 3) Set up equipment.
- 4) Add 5-10% more lime to the material over the amount determined by the bench scale test to the waste solids and mechanically mix until the material appears to be homogeneous. Note: Lime addition can only attain a pH of 12.4.
- 5) Sample the neutralized waste for analysis.
- 6) Wastewater generated from neutralization may be managed as described in Section A1 above.

Typical Detailed Procedures for Neutralization and pH Adjustment of Basic Solids

- 1) Conduct a bench-scale test to determine the reagent requirements to neutralize a known volume of waste solids.
- 2) If sulfides are present, determine if there is a danger that H_2S will be liberated. If the danger exists, consult Process Engineering to determine whether H_2O_2 should be added for oxidation of the H_2S .
- 3) Set up equipment.
- 4) Add ferric sulfate or similar acidic compounds to the waste in accordance with volumes established by the bench-scale test and mechanically mix until the material appears to be homogeneous.
- 5) Perform pH measurements during the chemical addition and mixing to monitor the progress of the neutralization.
- 6) Sample the neutralized waste for analysis.
- 7) Wastewater generated from neutralization may be managed as described in A1 above.

B. Oxidation of Sulfidic Wastes

Many wastes accepted at the HWTSE require chemical or air oxidation. An example of a waste requiring chemical oxidation is an aqueous solution containing hydrogen sulfide. There are various chemicals used to oxidize hydrogen sulfide including hydrogen peroxide, sodium hypochlorite, potassium permanganate, and ferric sulfate. This treatment process takes place in steel vessels in Area III. Typical equipment that may be used in this process includes circulation/transfer pumps, chemical feed containers, injection pumps, meters, and air compressors.

Oxidized sulfidic wastes may be further treated as allowed by this Section. If the resulting wastewater is to be discharged to the effluent treatment system, it is first analyzed to ensure compliance with hazardous waste regulations and the Refinery's NPDES permit.

See Figure IX-3 for a typical oxidation process diagram.

Typical Detailed Procedures
for Oxidation of Sulfidic Wastes

- 1) Obtain a sample and test for pH, concentration of sulfides, and total iron in solution.
- 2) Calculate the necessary amount of oxidizer to be used during oxidation. Several reagents may be used to accomplish this, including hydrogen peroxide, ferric sulfate, chlorine dioxide, and potassium permanganate.
- 3) Nitrogen blanketing may be necessary.
- 4) Set up equipment per Figure IX-3.
- 5) If material is a solid, load 100 barrels of fresh water in the effluent container.
- 6) Reinspect all grounding cables.
- 7) Inject ~0.5 gal./min. of 35% hydrogen peroxide through the hydrogen peroxide injection system, while nitrogen-agitating the effluent.
- 8) Monitor the temperature rise of the neutralizing container, hydrogen peroxide injection rate, and pH.
- 9) If the temperature rises to 100°F, stop the injection of hydrogen peroxide. Allow the temperature to stabilize below 100°F while agitating for 20 minutes minimum with nitrogen.
- 10) Once the temperature has stabilized below 100°F, continue the addition of hydrogen peroxide at 0.5 gal./min. If the temperature rise is not controllable at 0.5 gal./min., decrease the hydrogen peroxide injection rate below 0.5 gal./min.
- 11) Once the temperature has stabilized, add ~2 gal. of hydrogen peroxide and note if the temperature rises.
- 12) If no temperature rise is noted, isolate the hydrogen peroxide injection. Clear the injection system using demineralized water to purge the hydrogen peroxide into the circulation container.
- 13) Take a sample of the effluent, label it with the container number, pH, source, and date and place it in the lab for analysis.
- 14) Manage the effluent per A1 above.

**C. Oxidation of Wastes With Ignitable/
Flammable/Pyrophoric/Self-Heating Properties**

Wastes generated at the Refinery may have ignitable/flammable/pyrophoric/self-heating properties and require treatment to reduce or remove these properties. Oxidation is normally accomplished by air sparging and takes place in bins in Area IV. See Section VII for compliance with air emission requirements of Title 22, Subpart CC.

In instances where volatile organic compounds are present in the waste, steam or heated nitrogen might be used to volatilize the VOC's rather than air. The sparged vapors are recovered by vapor recovery equipment. The temperature of the waste is constantly monitored as is the VOC content of the sparged vapors when they are present in the material. Typical equipment that may be used in this process includes an air lance, compressed air, nitrogen, steam, fresh water, pumps, and monitoring equipment.

If the resulting wastewater is to be discharged to the effluent treatment system, it is first analyzed to ensure compliance with hazardous waste regulations and the Refinery's NPDES permit.

Typical Detailed Procedures for Oxidation of Materials
With Ignitable/Flammable/Pyrophoric/Self-Heating Properties

- 1) A recently filled bin containing material should initially be monitored for temperature at 2-hour intervals. If a temperature gain of 10°F is detected, the monitoring interval should be once every hour.
- 2) If the temperature of the material increase in excess of 10°F, it will be necessary to flood the container with water.
- 3) Aerate the flooded material using an air lance placed in several locations and at various depths of the material for approximately 8 hours.
- 4) Take a sample of the oxidized material, remove the water, and allow to dry. Observe the drying material to see if it continues to self-heat. If it does, the oxidation is incomplete and more sparging will be necessary. If the sample does not increase in temperature, remove the liquid in the container and allow the material to dry. The removed water will normally be handled as a hazardous waste.
- 5) Set a quench hose next to the container and monitor the temperature as outlined in Step 1.
- 6) If no temperature gain is measured during this period, the process is complete.
- 7) If the material continues to exhibit self-heating properties, it will be necessary to repeat Steps 2-6.

D. Metal Reduction, Precipitation, Flocculation, and Sedimentation

Many aqueous wastes accepted at the HWTSF require chemical reduction to render them amenable to precipitation. Examples of these wastes include aqueous wastes containing hexavalent chromium, selenates, nickel, and mercury compounds. Chemical reduction typically take place as part of precipitation, flocculation, and sedimentation processes carried out in a mix container in Area III of the HWTSF. Reducing agents typically used in these processes include sodium bisulfite and ferrous sulfate. Ancillary equipment typically used in this process includes chemical injection pumps, chemical batch mix containers, and meters.

These methods are listed together since they are commonly used as consecutive treatments on the same aqueous waste stream. All processes are conducted in steel vessels in Area III. Metals precipitation is described below.

This process typically involves the use of pH adjustment to chemically precipitate inorganic compounds (mainly metals) from an aqueous solution. The precipitated material typically forms metal hydroxide flocs and separates by means of sedimentation. Reagents typically used in this process include sodium hydroxide, calcium hydroxide, sodium sulfite, ferric chloride, and polymers.

Ancillary equipment used in this process includes chemical injection pumps, meters, compressed air, a forklift, and a vacuum truck.

When the treatment is completed, the supernatant liquid and the settled precipitates are processed through a mechanical dewatering device such as a filter press or a centrifuge. If the resulting wastewater is to be discharged to the effluent treatment system, it is first analyzed to ensure compliance with hazardous waste regulations and the Refinery's NPDES permit.

Typical Detailed
Procedures for Metal Reductions

- 1) Conduct a bench scale test to determine the reagent requirements for the reduction and precipitation of a known volume of chromium contaminated wastewater.
- 2) Set up equipment.
- 3) Start mixers on mix container.
- 4) Begin addition of chemicals in accordance with parameters established by bench-scale testing.
- 5) Add hydrochloric or similar acid to attain a pH of 4.0.
- 6) Begin addition of sodium bisulfite or other reducing agent and measure progress of the reduction with an oxidation/reduction potential (ORP) meter until the solution reaches 250 mv or less.
- 7) Begin the precipitation with lime or similar caustic material and bring the pH up to 10-11.
- 8) When pH has been attained, allow solution to mix for 30 minutes to ensure that the pH is stable.
- 9) Shut off mixers and allow material to settle.
- 10) Using a filter press, decant off the supernatant liquid and then dewater the settled sludge.
- 11) If the resulting wastewater is to be discharged to the effluent treatment system, it is first analyzed to ensure compliance with hazardous waste regulations and the Refinery's NPDES permit.

Typical Detailed Procedures for Metals
Precipitation, Flocculation, and Sedimentation

This procedure describes a simple chemical precipitation of an aqueous solution containing nickel.

- 1) Conduct a bench scale test to determine reagent requirements and treatment characteristics of a known quantity of wastewater.
- 2) Determine if odor control is necessary.
- 3) Set up equipment and start mixers on mix container.
- 4) Add lime slurry to waste in accordance with parameters established by the bench scale test until a pH of 10-10.5 is attained.
- 5) When target pH is achieved, allow container to mix for 30 minutes and test for pH again.
- 6) If pH is stable at desired level, shut off mixers and allow waste to settle. During this time, flocculation and sedimentation occur.
- 7) Using a filter press, decant off the supernatant liquid and then dewater the settled metal hydroxide sludge.
- 8) If the resulting wastewater is to be discharged to the effluent treatment system, it is first analyzed to ensure compliance with hazardous waste regulations and the Refinery's NPDES permit.

E. Stabilization

Stabilization is used to eliminate the fluid nature of a material. A stabilizing material such as cement, clay, or diatomaceous earth is added to the waste. Stabilization is done in bins in Area IV. Depending on the amount of material, this process generally takes about 4 hours to complete. The resulting waste is sampled according to the procedures outlined in Section VIII. See Section VII-D for compliance with air emission requirements of Title 22, Subpart CC.

Personal protective equipment such as masks and/or respirators are strictly required for this treatment, and care is taken to minimize the amount of dust created.

Typical equipment that may be used in this process includes bin trucks, backhoes, and forklifts.

Typical Detailed Procedures for Stabilization

The procedure for chemically stabilizing a waste in a bin is as follows:

- 1) Place empty bin next to bin needing treatment.
- 2) Add enough inert material (e.g., cement, clay, etc.) to the empty bin to cover ~1 foot of the bin.
- 3) Using a backhoe or similar equipment, transfer over ~1 foot of waste material and mix thoroughly.
- 4) Again, add ~1 foot of inert material to the bin, and continue with this process until the bin is full or all of the waste has been stabilized (whichever comes first).

F. Deliquescence, Filtration, and Phase Separation

Materials may enter the HWTSF that contain free oil and/or water. In addition to decanting, mechanical means are usually used to reduce the waste volume. It is generally desired to assure that sufficient liquid is removed so that the residual solids, if hazardous and destined for off-site management, will pass the oil/water/solids test per Section VIII.

Typical equipment that may be used in this process includes centrifuges, plate-and-frame filter presses, and belt-filter presses. The equipment is operated in Area V. See Figure IX-4 for a typical plate-and-frame filter press process diagram.

Centrifuges and belt filter presses may use polymers, filter aids, or other agents mixed with the waste feed to improve the separation efficiency and rate.

The general process of dewatering includes the addition of a coagulating medium and a physical process to force liquids out, resulting in a dry cake.

If the resulting wastewater is to be discharged to the effluent treatment system, it is first analyzed to ensure compliance with hazardous waste regulations and the Refinery's NPDES permit.

If needed, the cake may be stabilized as allowed by this Section.

Typical Detailed Procedures for Dewatering and Filtration

- 1) Vent the press by pumping water from the pre-coat container into the filter press, while leaving only the top two effluent valves open.
- 2) Once full, open the bottom two valves of the press and pre-coat container to allow water to circulate between them.
- 3) Add diatomaceous earth to the pre-coat container while circulating to coat the press with a fine film in which the solids will be trapped.
- 4) Pre-coating is complete when the water returns to a clear state.
- 5) Pump the waste material into the feed container and add diatomaceous earth again. This will aid in the filtration of solids. Use an agitator to mix the two; the end result being a homogenous feed.
- 6) Begin feeding the semi-solid to the press with a pump. This will displace the circulating water. Open the filtrate valve to the filtrate container and allow this displaced water to flow freely into it.
- 7) Continue pumping the semi-solid into the press until the press pressure reaches 100 psi, indicating a full load.
- 8) Shut pump down and begin introducing air into the press. The air will displace any free liquids from the cake. Continue until all of the free-liquid has been removed from the discharge ports.
- 9) Shut air off and open the press using the hydraulic controls. Separate the plates and remove the dry cake from them. Once all the cake has been removed, close up the press, completing the cycle.

G. Sparging and Stripping

Air and nitrogen are commonly used in the HWTSE to stir containers during the treatment processes that take place there. This may be done in Areas III, IV, or V. Air sparging is also used in the oxidation of catalysts as described in Section C above. Occasionally there are volatile organic compounds (VOCs) associated with the materials being sparged or stirred. In these instances, the VOCs are stripped from the sparged waste and are captured in vapor recovery equipment. In certain instances a material is sparged specifically to remove a volatile component of the waste. An example of this is spent catalyst. Spent catalyst may occasionally be contaminated with VOCs. Some of these VOCs are present after the oxidation (described in Section C above) has taken place and are subjected to further dry sparging using steam or heated nitrogen. This type of sparging has the effect of stripping residual VOCs. The vapors from this process are captured in vapor recovery equipment. See Section VII for compliance with air emission requirements of Title 22, Subpart CC.

Figure IX-1

Typical Flow Chart for Treatment of Waste

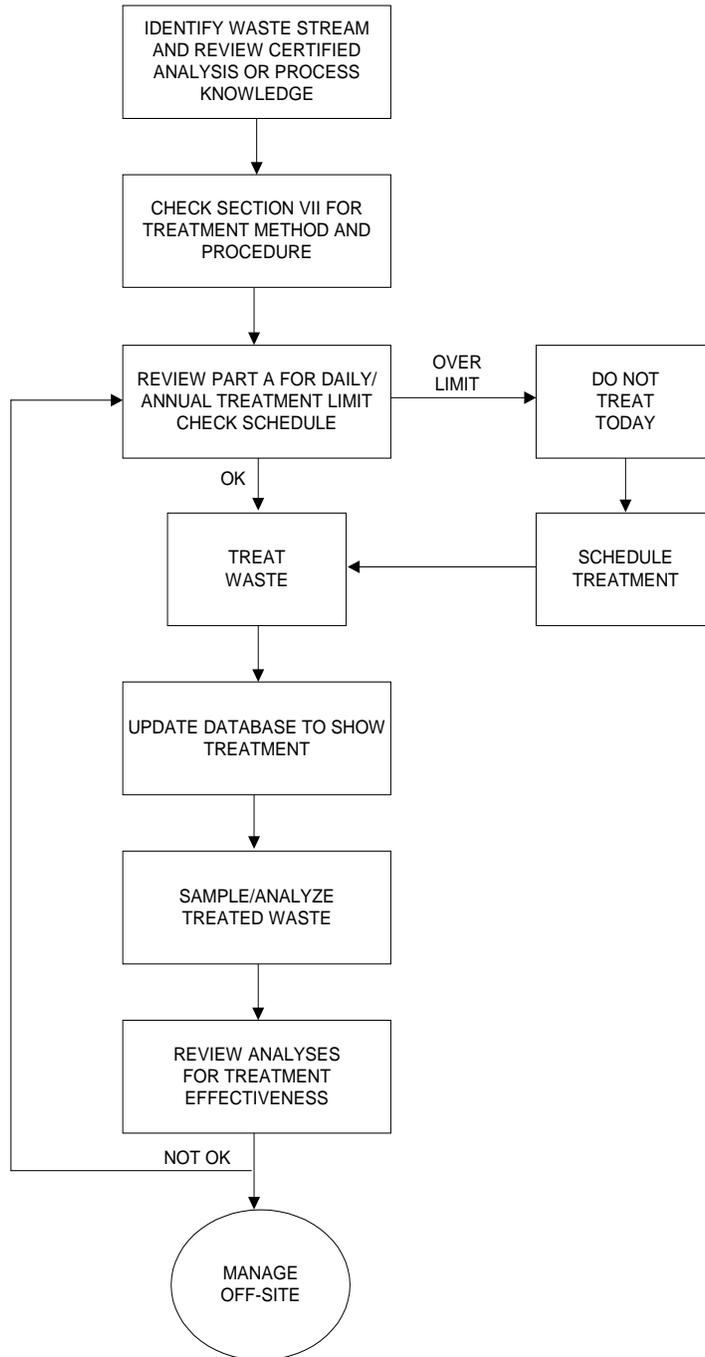


Figure IX-2

Typical Diagram of Neutralization of Waste Corrosive Liquids (Acids and Bases)

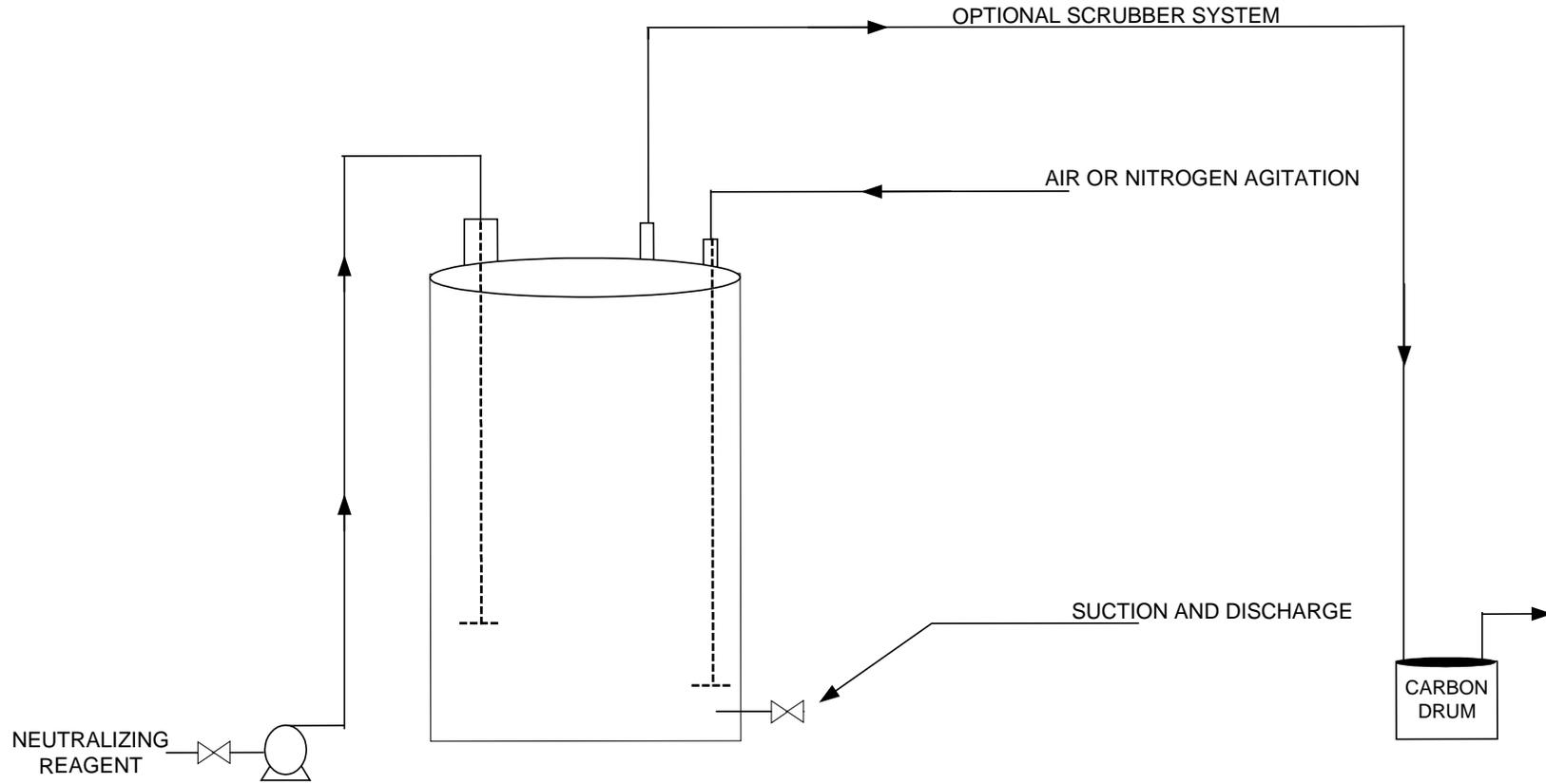


Figure IX-3

Typical Diagram of Oxidation of Sulfidic Wastes

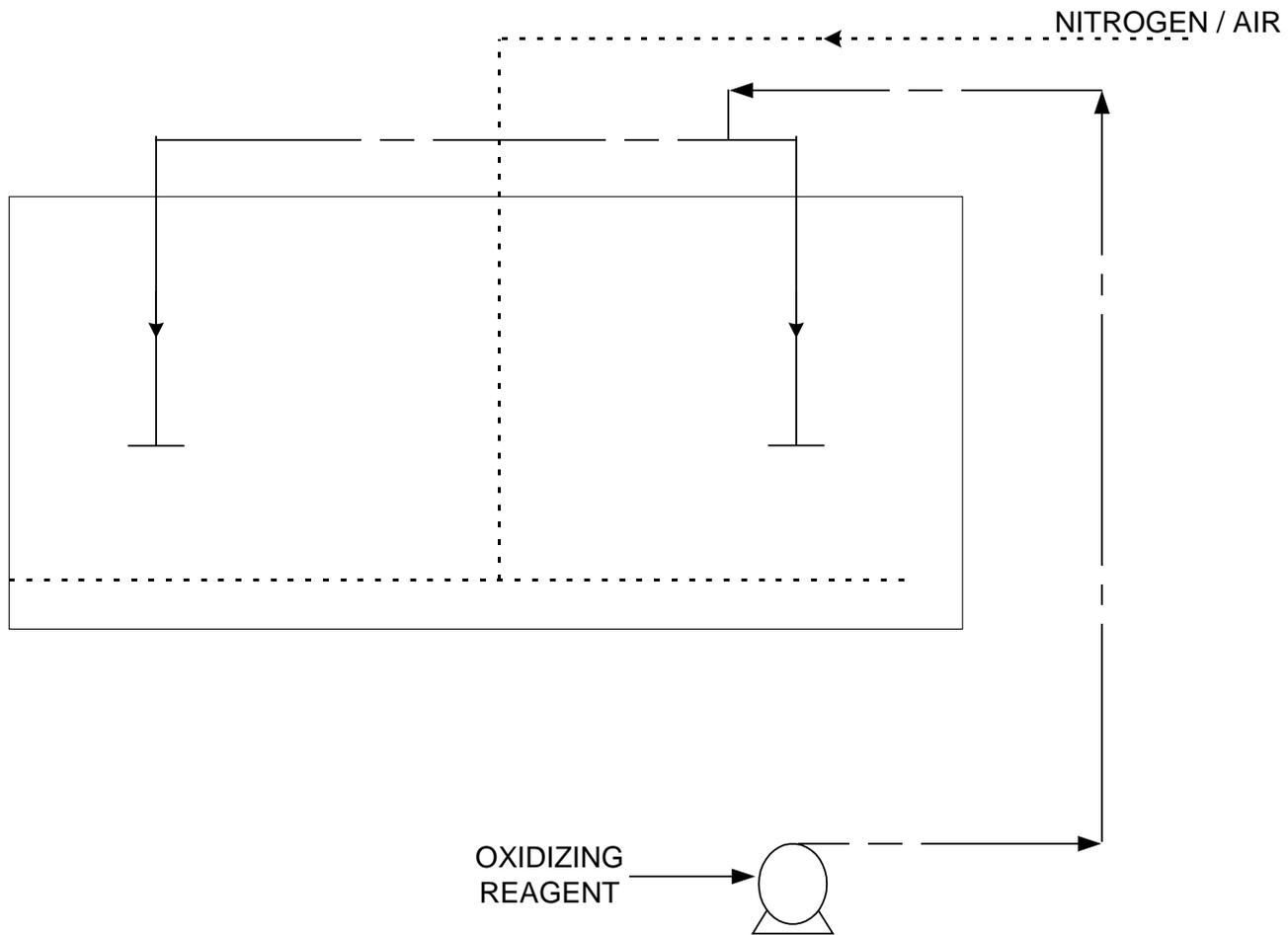
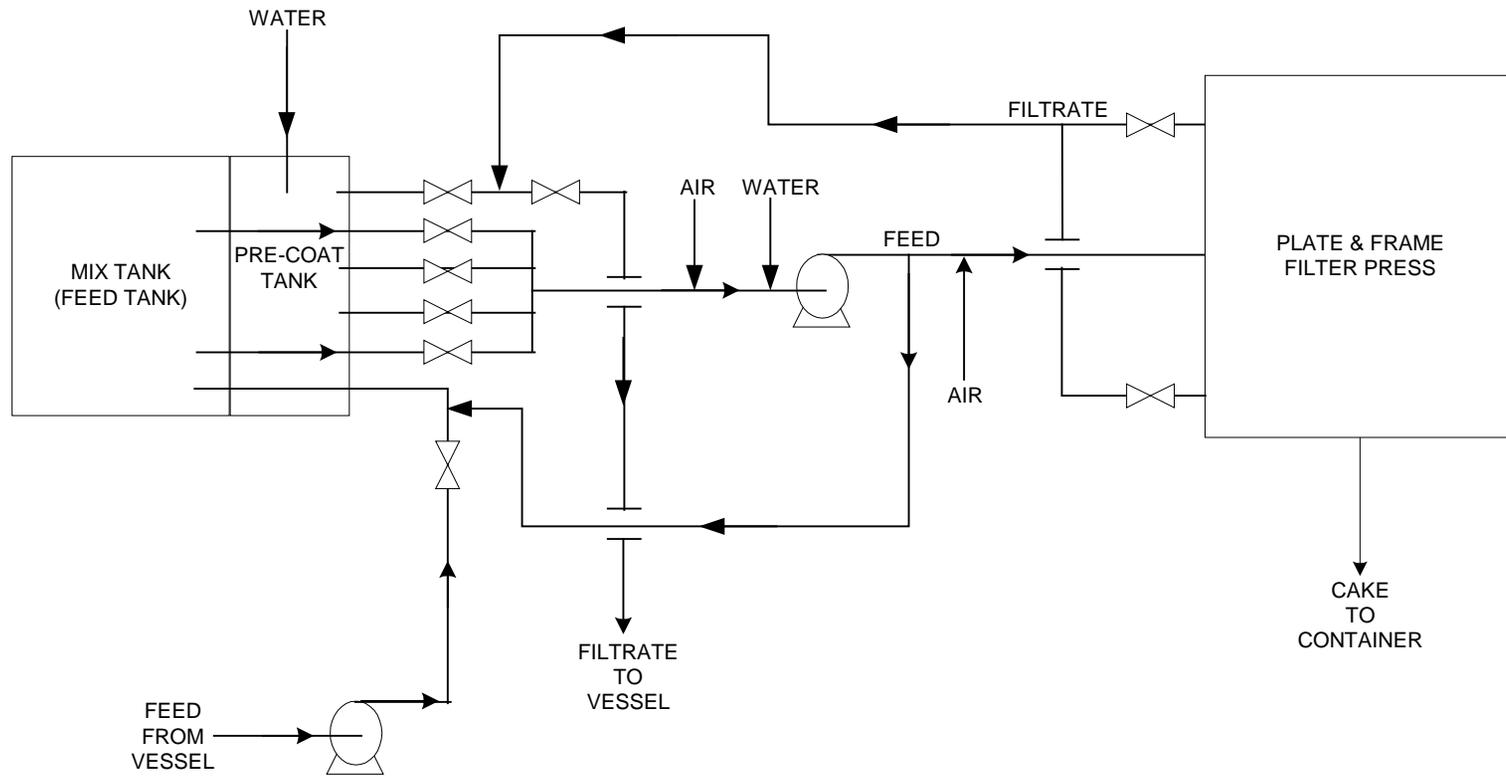


Figure IX-4

Typical Diagram for Dewatering of Sludges in a Plate and Frame Unit



X. Inspection Procedures

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- Figure X-3 HWTSF Alarm and Evacuation Drill Test Record
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X. Inspection Procedures

A. Introduction

The objective of the Inspection Procedures is to prevent accidental releases of hazardous wastes to the environment and ensure safety of HWTSF personnel. The Inspection Procedures complies with CCR Title 22, §66264.15 and §66264.33.

Prior to performing inspections for the first time, an inspector is required become completely familiar with:

- These Inspection Procedures
- Both Tables in Section V
- Both Tables in Section VIII

Maintenance of Completed Inspection Checklists

Completed inspection checklists are maintained on-site by hazardous waste personnel for a minimum of 3 years.

1. Inspection Schedule

The frequency of inspection is based on regulatory requirements, typical rates of deterioration of equipment, and the probability of environmental or human health damage occurring if malfunction or deterioration occurs between inspections.

Designation	When to Inspect	Use Checklist No.
Area I – Storage for Drummed Waste	Weekly	4
Area II – Neutralization	Weekly	3
Area III – Bulk Liquid Storage and Treatment		
All Routine Inspections	Weekly	3
Internal Inspection	Annually	3
Area IV - Solid Waste Bin Storage	Weekly	3
Area V – Liquid/Sludge Waste Storage and Treatment		
All Routine Inspections	Weekly	3
Internal Inspections	Annually	3
Safety and Emergency Equipment	Weekly/Monthly	2
Spill Response and Control Equipment	Monthly	2

Designation	When to Inspect	Use Checklist No.
General HWTSF Inspection		
Equipment for Waste Transfer Operations	Each Operating Day	1
All Others	Monthly	1

2. Inspections After Earthquakes

Additional inspections are required to be conducted immediately after earthquakes of intensity VI or greater, as explained on the Modified Mercalli Intensity Scale, or 6.0 magnitude or greater on the Richter scale occurring within a 50 mile radius. The inspector will use the same checklists as in a regularly scheduled inspection; however, a notation is to be made on the checklists indicating the inspection is being made because of an earthquake.

Modified Mercalli (Mm) Intensity Scale of 1931

- I. Not felt except by a very few under especially favorable circumstances.
- II. Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
- III. Felt quite noticeably indoors, especially in upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration like passing of truck; duration estimated.
- IV. During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed. Walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
- V. Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
- VI. Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster and damaged chimneys. Damage slight.
- VII. Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures. Some chimneys broken. Noticed by persons driving motor cars.
- VIII. Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.

- IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.
- X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.
- XI. Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.
- XII. Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Line of sight and level are distorted. Objects are thrown upward into the air.

Source: Griggs and Gilchrist, The Earth and Land Use Planning, Duxbury Press, North Scituate, Massachusetts, 1977.

B. Inspection of Treatment and Storage Areas

1. Area I (Use Inspection Checklist #4, Weekly Checklist)

Drum and Container Condition

- Inspect for signs of leaks, pressure build-up, and deterioration such as cracks, blisters, and bulging.
- Labels and lids shall be inspected to ensure that they are properly attached and legible.
- Containers are closed with no visible gap.

Paved Area Immediately Surrounding Storage Buildings

- Check the asphalt for cracks, spalling, pitting, and uneven settlement.
- Cracks and other types of deterioration shall be repaired promptly to maintain structural integrity and to prevent liquids from potentially collecting under the storage buildings.
- Examine the asphalt pavement around the buildings for any evidence of wet spots or other discoloration that may indicate leaking.

Secondary Containment System

- Interior sumps shall be checked for cracks, spalling, pitting, and settlement.
- Note any wet spots or discoloration on the floor surface of the storage buildings that may indicate leaking containers.

Note if any liquid is present in the sumps and remove immediately per Table VIII-2.

**2. Area IV
(Use Inspection Checklist #3, Weekly Inspection)**

General Bin Inspection

- Inspect the exterior of bins for signs of corrosion or leakage.
- Check signs and labels to ensure that they are in place and properly filled out.
- Bin capacity shall be noted.
- Bins should be closed with no visible gaps.

Paved Area Immediately Surrounding Bin Area

- Check the concrete for cracks, spalling, pitting, and uneven settlement.
- Check concrete pad for evidence of wet spots or other discoloration that may indicate leakage.
- **Cracks or decay shall be repaired promptly to maintain structural integrity and to prevent liquids from collecting under the bins.**

**3. Area II, Area III, and Area V
(Use Inspection Checklist #3, Weekly Inspection Except Where Noted)**

Overfill Control - Inspect During Each Operating Day if Vessels Contain Material

- Gauge liquid level and determine volume in barrels (42 gal.) with a strapping conversion chart.
- Compare volume to expected volume.

Exterior Condition

- Check for damage such as leaks, cracks, buckles, bulges, or distortion.
- Look for presence of wet spots, especially around connections, seams, any spalled areas, welds, and joints.
- Where possible, open and close access hatches and check for proper seal.
- Examine gaskets for resiliency, cracking, or hardening.
- Check fittings and connections for leaks, distortion, or deterioration.
- Check safety valves for blockage, clogging, or corrosion.
- Check signs and labels to ensure that they are in place and legible.
 - See Figure VII-5 that indicates the proper appearance/condition of vessel signs.
 - If there is any evidence of damage to a sign, or if there is one missing, note the number and location of the sign on the checklist and ensure that the problem is resolved.
- Vessels should be closed with no visible gaps.
- For steel vessels:
 - Visually check the surface for rust spots and blisters by scraping the film in suspected areas. Paint blisters can most often be found on the roof and sides that are exposed to sunlight.

Valves, Pipes, Fittings, and Hoses

- Inspection is critical to detect potential losses in metal or rubber thickness due to external or internal deterioration. Such losses in thickness could potentially occur through high liquid turbulence, fluid velocity, or contact with incompatible substances, causing erosion and wear.
- Visually inspect all valves in the vessel system to ensure that the seating surfaces are in good condition (i.e. look for leaks, drips, spills, etc.).
- Inspect hoses for signs of wear, cracking, and leaks.
- **All hoses shall be hydrotested annually. Note the date of hydrotesting.**
- For steel vessels:
 - Check metal pipes for external corrosion through a visual examination, noting any discoloration or scaling.

Pavement Surrounding Vessels

An inspection shall be conducted of the pavement immediately surrounding the external portion of the vessel system for signs of erosion or releases.

- Check the concrete/asphalt for cracks, spalling, pitting, and uneven settlement.
- Look at the concrete/asphalt around the vessels for any evidence of wet spots or other discoloration that may indicate leaking.
- Other general support structures shall be visually examined for cracking, spalling, pitting, and uneven settlement.
- **Cracks and other types of deterioration shall be repaired promptly to maintain structural integrity and to prevent liquids from collecting under the vessels.**

Secondary Containment Systems

The secondary containment system shall be inspected for structural integrity.

- All concrete parts, berms, and sumps where present, shall be checked for cracks, spalling, pitting, and settlement.
- Note any wet spots or discoloration that may indicate leakage of the vessels.
- Note if any liquid is present in the drain trench.
- Remove any debris that may be blocking or clogging the drain trench.
- For Area II:
 - The surface of the removable galvanized steel gate should be smooth and in good condition.
 - Examine neoprene gaskets on the steel gate for resiliency, cracking, or hardening. The secondary containment gate should provide a tight seal when bolted in place, so as to prevent leakage of accumulated liquids from the curbed secondary containment area.

Annual Internal Vessel Inspection

If a vessel is on-site more than 1 year it shall be inspected. Areas of deterioration may need to be recoated before the vessel is put back into service.

- Follow all refinery instructions for *confined space entry*.
- When safe to enter:
 - Look at the condition of the joints between the walls and roof and between the walls and bottom. Look at the roof, sides, ends, and bottom and record any buckles, bulges, or distortions that are present. Look for evidence of pitting, cracking, spalling, and erosion.
 - Ensure areas of deterioration are recoated before the container is put back into service.

Interior Condition of Polyethylene Vessels - Inspection Following Each Decontamination

- While standing atop the vessel, look down through the access hatch with a bright flashlight and scan the interior from top to bottom all the way around.
- Look for any discoloration, cracks, and the permeation of natural light.
- Look for any buildup of residues at the bottom of the vessel.
- Check the access hatch for proper seal. Examine gaskets (if applicable) for resiliency, cracking, and/or hardening.

**C. General HWTSF Inspection
(Use Inspection Checklist #1, Monthly Inspection Except Where Noted)**

Areas and items of the HWTSF not previously addressed shall be inspected.

1. Equipment for Waste Transfer Operations

When this equipment is being used, it must be inspected during each operating day. Otherwise, it may be inspected monthly.

- A list of the equipment used for waste handling and transfer operations, including the location of capabilities of each type, is given on Table V-2.
- Evidence of deterioration, corrosion, and abnormal sounds at any time shall be addressed immediately in order to avoid equipment failure.

a) Pumps

When used at the HWTSF, they should be inspected upon first usage and then as stated above in subsection C1. Although mechanical wear is the primary potential cause of deterioration to pumping equipment, erosion and corrosion can also be contributing factors.

- Locate each pump and visually inspect it for signs of significant corrosion, blisters, and rust scale which could affect pump operation.
- Look for leaks in the connections and pump seals.
- Carefully examine the pump assembly bolts, gaskets, cover plates, and flanges for tightness, signs of wear and tear, and corrosion.

- If the pump is on, listen for any abnormal sounds and look for excessive vibration.
- Examine the integrity of the mechanical connections.
- If the pump has an oil reservoir, ensure that it is full.

b) Piping, Hoses, and Fittings

Inspection of valves, pipes, fittings, and hoses is critical to detect potential losses in metal or rubber thickness due to external or internal deterioration and abrasion. Such losses in metal thickness could potentially occur through high liquid turbulence, fluid velocity, or contact with incompatible substances.

- Visually inspect all valves in the vessel system to ensure that the seating surfaces are in good condition (i.e., look for leaks, drips, spills, etc.).
- Scan the entire piping system for leaks and deterioration. If leaks were to occur they would most likely take place around pipe bends, elbows, tees, and flow restrictions.
- Metal pipes shall be checked for external corrosion through a visual examination, noting any discoloration or scaling.
- Hoses shall be inspected closely for signs of wear, cracking, and leaks.
- Hoses shall be hydrotested annually.

2. Security Devices and Signs

Map #3 shows the locations of the HWTSF gates, signs, and outdoor lights that shall be inspected.

a) Perimeter Fence and Perimeter Signs

- Figure X-1 shows examples of the security warning signs for the perimeter fence.
- A 6-foot-high chain link fence follows the perimeter of the HWTSF. Signs are located at intervals on the fence.
- Check that signs are not missing from designated locations.
- Check that the signs are affixed securely to the fence.
- Ensure that each sign is legible in both English and Spanish from at least 25 feet.
- If there is any evidence of damage to a sign or if one is missing, note on the inspection checklist and repair/replace immediately.
- Ensure that the chain link fence is anchored properly and check for any holes or breaks.
- Record any signs of forcible entry.
- Examine the fence supports to ensure that they have not suffered from corrosion, deterioration, or impacts.

b) HWTSF Gates

- Check all parts of the gate for signs of corrosion, cracks, or breakage.
- Open and close the gate to ensure that it moves smoothly without sticking.
- Use the gate lock combination or key to open the lock and make sure that it works correctly.

c) Main Entrance Gate and Signs

- Inspect the 30-foot motorized entrance gate to ensure that it is functioning properly.
- Check the signs on the gate to ensure that they are in place and are legible.
- If there is any evidence of damage to a sign, or if one is missing, note the sign number and its general location on the inspection checklist.

d) Outdoor Lighting

- While they are in the “on” position, visually check the lights in the locations shown on Map #3. This inspection is best conducted when daylight is not strong, such as early morning or late evening.
- Replace any light bulbs that do not work and make sure the replacement bulbs are working.

3. Secondary Containment and Surface Integrity

- The secondary containment system consists of a neoprene-lined concrete curb that follows the perimeter of the HWTSE, as shown on Map #2. Inspect its structural integrity for evidence of cracks, spalling, pitting, and uneven settlement.
- Inspect asphalt surfaces that are not inspected during inspection of Areas I–V (for example, areas along the perimeter, the decontamination area, and the office/laboratory area).
- Check for any deterioration in the asphalt surface.

**D. Safety and Emergency Equipment
(Use Inspection Checklist #2, Weekly/Monthly Inspection)**

- The locations of this equipment are shown on Map #3.
- An adequate supply must be available at all times for all HWTSE employees and visitors.
- Emergency equipment shall be inspected to ensure proper operation and maintain adequate supplies.
- The equipment includes fire fighting equipment, first-aid equipment, respirators, protective clothing, and spill response and control equipment.
- Equipment that does not pass inspection must be noted on the appropriate checklist and repaired/replaced as soon as possible.

1. Personal Protection Equipment

- Locations of personal protection equipment (PPE) such as hard hats, gloves, and safety glasses, etc., are shown on Map #3.
- The number of items available and their storage locations are indicated in Table VI-1.
- Items out of stock, low on stock, or not working properly must be replaced.
- Ensure that reusable items have been decontaminated, dried, and properly replaced in the proper storage location after use.
- Any equipment or supplies found blocking access to PPE must be moved immediately.

a) Respirators

- Air-purifying respirators and respirator cartridges shall be inventoried to ensure items are in stock and functioning properly.
- Items that are out of stock, low on stock, or not working properly must be replaced.
- Check respirators to ensure they are clean.
- Thoroughly check the plastic and rubber portions of the respirators for cracks and deterioration.
- Respirators must be decontaminated after use and shall be stored in clean sealed plastic bags.

b) Self-Contained Breathing Apparatus

Self-contained breathing apparatus (SCBA) shall be stored in carrying cases or on designated storage racks. Inspection procedures for the SCBA equipment are as follows:

- Check the contents of each air cylinder by inspecting the pressure gauge for the “full” indication. If the cylinder is not full, it shall be filled or replaced with a full cylinder.
- With the regulator connected to the cylinder, close the main-line valve and open the cylinder valve.
- Cover the breathing tube outlet with your hand and open the main-line regulator valve.
- Compare the pressure of the cylinder gauge to that of the regulator gauge. Look for changes in regulator gauge pressure and listen for air leaking from the regulator.
- Close the cylinder valve and slowly let air escape from the breathing tube outlet. Listen for the alarm bell to ring and note the gauge pressure.
- Visually inspect the facepiece and breathing tube. Look for dirt, cracks, tears, and holes in the rubber and scratches or dirt on the transparent face cover.
- Check the exhalation valve for cleanliness.
- Check to make sure harness (belts, clasps) are not tangled or defective.

2. Safety Showers and Eyewashes

- Safety showers and eyewashes are located as shown on Map #3.
- The quantity which must be available at any given time is shown on Table VI-1
- They shall be inspected and flushed once per week.
- The showers and eyewashes shall be checked for condition and proper operation as follows:
 - Turn on the eyewash or shower and ensure free and clean flow of water.
 - If pressure is low or not constant, look for leaks, wet spots, or corrosion on all piping and fittings.
 - Check angle and height of spray.
 - Make sure eyewashes have protective caps over the orifices to keep dirt/debris out.
 - Safety showers and eyewashes should be painted bright green. Paint should be in good condition.

3. Fire Fighting Equipment

- The locations and descriptions of fire fighting equipment are indicated on Map #3 and Table VI-1.

- All fire fighting equipment shall be readily accessible at all times. Any equipment or supplies found blocking fire fighting equipment must be moved immediately.
- Ensure that the location identification sticker on all fire fighting equipment is in good condition. This sticker ensures that equipment is returned to its proper location following use.
- Make sure that all identifiable coloring (paint) is in good condition. All fire fighting equipment should be painted bright red.

a) *Fire Extinguishers*

- Dry chemical fire extinguishers and foam units with hoses are located throughout the HWTSF.
- Dry chemical fire extinguishers must be tested and, if necessary, recharged annually and a tag affixed that indicates the date of the test. Ensure that this tag is attached to the fire extinguisher and that the test was performed within 1 year prior to the date of the inspection.
- If a fire extinguisher has a pressure gauge, ensure that the fire extinguisher has not been discharged.
- If a fire extinguisher is taken out of service, it must be replaced immediately with another so that each prescribed location always has a fire extinguisher.

b) *Foam Units and Fire Hoses*

- All foam units and fire hoses shall be inspected to ensure that they are in good condition. Look for tears, abrasions, and loose connections.
- A nozzle and spanner wrench should be available and stored in a secure cabinet.
- Inspect foam units and valves to ensure accessibility.
- Inspect foam units and valves to ensure sufficient water pressure by turning on the water.
- Check that each foam container is full (55 gal.).

4. Spill Response and Control Equipment

- The number of items available and their storage locations are indicated in Table VI-2.
- Inventory the spill response and control equipment to ensure that items are in stock.
- Items out of stock or low in stock must be replaced.
- Check that reusable items have been decontaminated, dried, and replaced in the proper storage location after use.

5. First-Aid Kits

- First-aid supplies and first-aid kits are located as shown on Map #3.
- The quantity that must be available at any given time is shown on Table VI-1.
- Inspection procedures for first aid kits will be as follows:
 - Open the kits and check to see if they contain all necessary items.
 - Check bottled eyewashes to ensure that they are located with the first aid kit, and replace missing or empty bottles.
 - Ensure that all first aid kits are adequately marked to indicate their proper storage locations.

**6. Internal Communications
Equipment and Evacuation**

This equipment is used frequently during daily operations and thus is automatically checked on an ongoing basis or immediately upon failure. The monthly inspection includes all communications equipment.

- Turn on and use each radio and intercom outlet.
- For equipment with batteries, test the battery with a battery tester to ensure that adequate charge is available.
- An evacuation drill will be run monthly to ensure equipment is in proper working condition and to keep HWTSF personnel familiar with the evacuation procedures. See figure X-5 for a typical evacuation drill test record.

7. Monitoring Equipment

- The proper location of this equipment is shown on Map #3.
- The quantity which must be available at any given time is shown on Table VI-1.
- Check to make sure that the hydrogen sulfide indicator, gas detector, and pH paper are located in the proper storage location and working properly.
- Turn the equipment on and see if readings can be obtained on the monitoring gauges using a bottle of calibration gas.

E. Inspection of Vehicles – Twice Yearly Inspection

Vehicles are leased to the HWTSF by a contract rental company as needed. A twice yearly inspection of the vehicles shall be conducted either by Chevron or an agent of Chevron. Inspection of vehicles shall include items such as the following:

- The vehicle's fluid levels.
- Visual inspection of the tires.
- Operation of headlights, tail lights, brake lights, parking lights, hazard lights, back-up warning devices, turn signals, and horn.

If any problems are noted in the above areas, the vehicle shall be repaired.

Figure X-1

Perimeter Fence Signs Used at the HWTSF

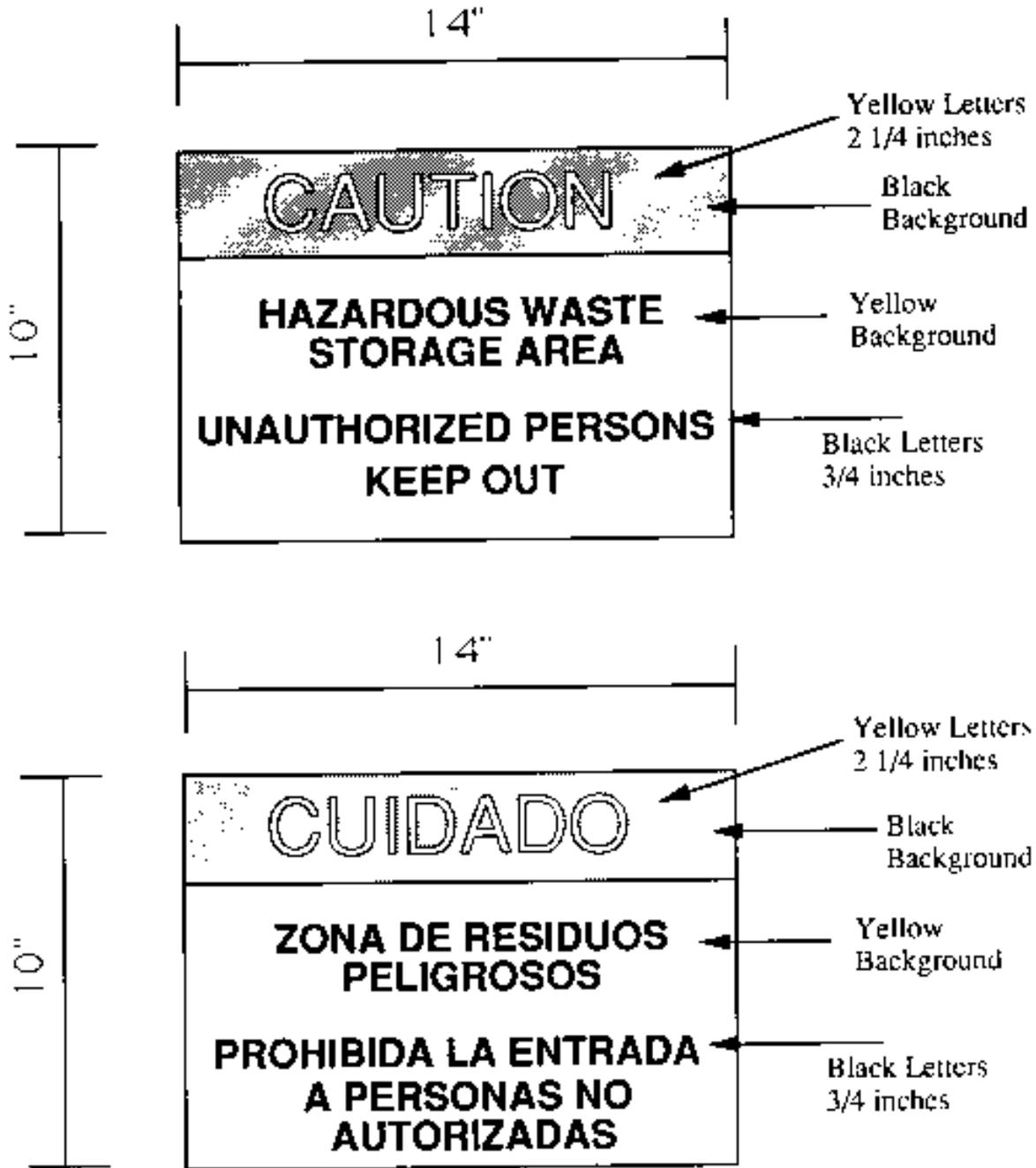


Figure X-2

Main Entrance Gate Sign at the HWTSF

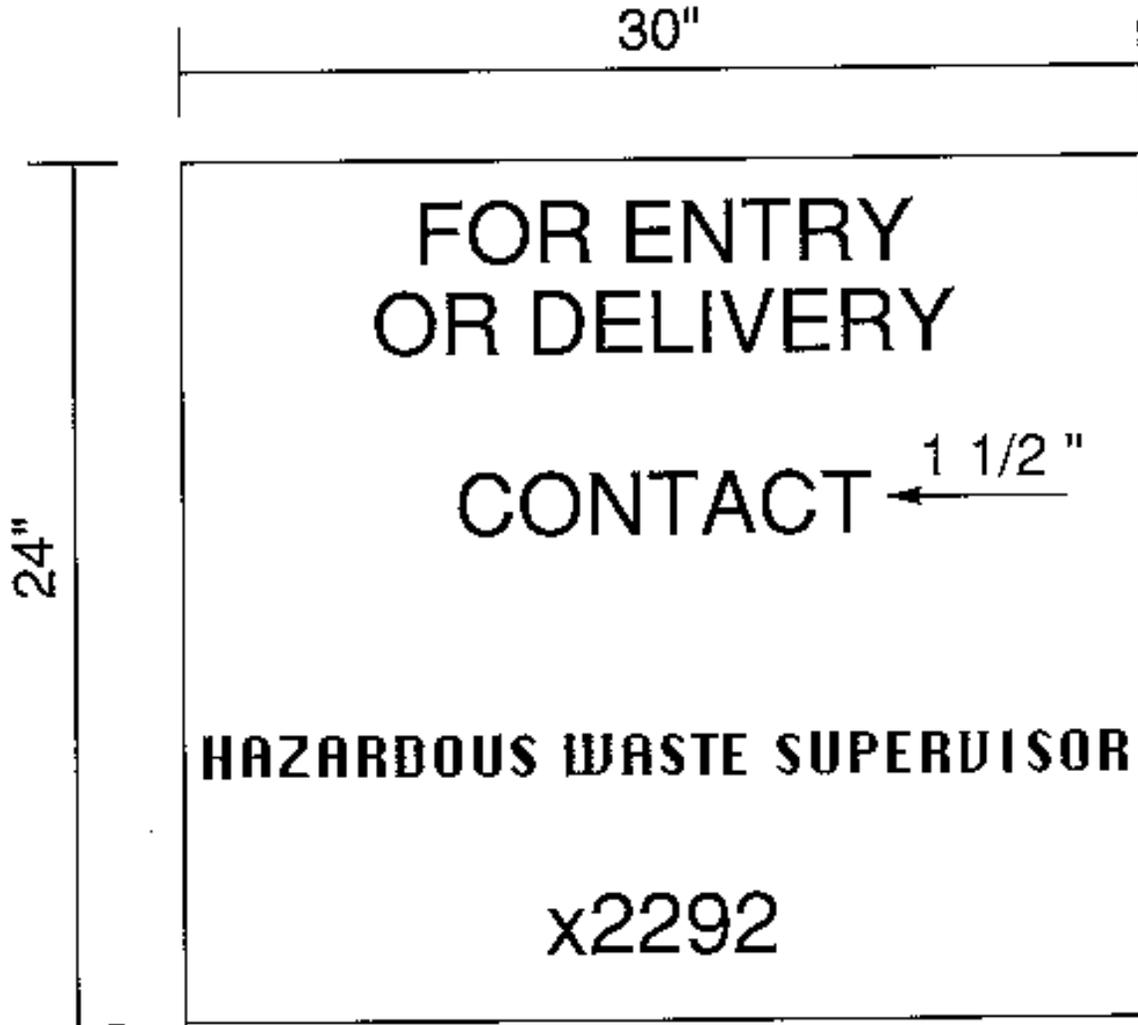


Figure X-3

HWTSF Alarm and Evacuation Drill Test Record

FACILITY ALARM TEST/ EVACUATION DRILL

DATE: _____
TIME: _____

COMMENTS

REMEDIAL ACTION

FACILITY SUPERVISOR

Attachment X-1
Inspection Checklists

Attachment X-1

Inspection Checklist 1 - HWTSE General Inspection (Monthly)

Inspector _____

Date _____ / _____ / _____

Time _____

Reviewer _____

Item	Observations/ Condition	Recommended Remedial Action	Date and Nature of Repairs/Initials
------	----------------------------	--------------------------------	--

Warning Signs

Legible, In Place, Damage, Etc. _____

Security Fences

In Place, Holes/Breaks, Supports, Etc. _____

Facility Gates

Smooth Operations, Lock Operation, Damage, Etc. _____

**Facility Secondary Containment/
Surface Integrity**

Structural Integrity, Settlement, Cracks, Wet Spots, Etc. _____

Area I _____

Area II _____

Area III _____

Area IV _____

Area V _____

Facility Perimeter

Sump – Area V _____

Sump – Area II _____

Sump Pump Operation

Vibration, Leaks, Corrosion, Etc. _____

Air Compressors

Vibration, Connections, Valves, Etc. _____

Pumps and Hoses

Vibration, Connections, Leaks,
Wear, Corrosion, Blisters, Etc. _____

Other _____

Attachment X-1

**Inspection Checklist 2 - HWTSE Safety and Emergency
Equipment Inspection (Weekly)**

Inspector _____

Date _____ / _____ / _____

Time _____

Reviewer _____

Item	Observations/ Condition	Recommended Remedial Action	Date and Nature of Repairs/Initials
Fire Extinguishers			
Inspection Tag Present, Test Performed Within 1 Year, Proper Pressure On Pressure Gauge, Etc.			
#1	_____	_____	_____
#2	_____	_____	_____
#3	_____	_____	_____
#4	_____	_____	_____
#5	_____	_____	_____
#6	_____	_____	_____
#7	_____	_____	_____
#8	_____	_____	_____
#9	_____	_____	_____
#10	_____	_____	_____
Hose Reels			
Condition, Nozzles Present, Spanner Wrench Present, Sufficient Water Pressure, Etc.			
#C38	_____	_____	_____
#C40	_____	_____	_____
#C41	_____	_____	_____
Safety Shower/Eyewash			
Leaks, Wet Spots, Corrosion, Free Flow of Water, Angle/Height of Spray, Obstructions in Drains, Etc.			
Front Gate #1	_____	_____	_____
Back Fence #2	_____	_____	_____
Portable #3	_____	_____	_____
Southeast #4	_____	_____	_____
Lab #5	_____	_____	_____

Attachment X-1

Inspection Checklist 2 - HWTSE Safety and Emergency Equipment Inspection (Monthly) (Cont'd)

Item	Observations/ Condition	Recommended Remedial Action	Date and Nature of Repairs/Initials
First-Aid Kit Proper Location Fully Stocked (1 Ea)	_____	_____	_____
Evacuation Sirens (Monthly) Clarity Throughout HWTSE	_____	_____	_____
Hydrogen Sulfide Indicator (1 Ea)	_____	_____	_____
Gas Detectors (1 Ea)	_____	_____	_____
pH Paper (1 Ea)	_____	_____	_____
Item	Observations/ Condition	Recommended Remedial Action	Date and Nature of Repairs/Initials

PERSONAL PROTECTION EQUIPMENT IN AREA J (Number in Stock, Condition, Proper Location, Accessibility, Etc.)

Hard Hat (6 Ea)	_____	_____	_____
Goggles (1 Case)	_____	_____	_____
Safety Glasses (6 Each)	_____	_____	_____
Gloves (1 Case)	_____	_____	_____
Boots (6 Pairs)	_____	_____	_____
Protective Suits (1 Case)	_____	_____	_____
MSA Full-Face Respirator (6 Each)	_____	_____	_____
MSA Half-Face Respirator (6 Each)	_____	_____	_____
Organic Vapor/ Acid Gas cartridges (1 Case)	_____	_____	_____
NH ₃ Vapor Cartridges (1 Case)	_____	_____	_____

Attachment X-1

Inspection Checklist 2 - HWTSF Safety and Emergency Equipment Inspection (Monthly) (Cont'd)

	Pressure Condition	Recommended Remedial Action	Date and Nature of Repairs/Initials
SCBA (Scott Air Packs)			
Proper Location, Air-Cylinder Full, Regulator Free From Leaks Regulator Gauge Matches Tank Gauge, Alarm Bell Functioning, Condition of Facepiece, Accessibility, Etc.			
#RDP1	_____	_____	_____
#RDP2	_____	_____	_____
#RDP3	_____	_____	_____
#RDP4	_____	_____	_____
Suitcase Model #	_____	_____	_____
Suitcase Model #	_____	_____	_____

	Observations/ Condition	Recommended Remedial Action	Date and Nature of Repairs/Initials
Spill Control Equipment (Number In Stock, Proper Location, Accessibility, Etc.)			
Spill Control Pillows (Several Cases)	_____	_____	_____
Spill Control Booms (Several Cases)	_____	_____	_____
Spill Control Sheets (Several Cases)	_____	_____	_____
Dam-Kit/Temp. Bbl Dike (4 Each)	_____	_____	_____
Hazardous Material Bags (Several Cases)	_____	_____	_____
Polypropylene Shovel (1 Each)	_____	_____	_____
Polyethylene Hand Pumps (2 Each)	_____	_____	_____
Floor Dry (1 Pallet, 50 Bags)	_____	_____	_____

Attachment X-1

Checklist 4 - HWTSE Drum Storage Building Inspection (Weekly)

Weekly Storage Building #1 Inspection				Page 1
Corrosives – Ignitable Solids – Ignitable Liquids Will Be Segregated in Rooms I, II, & III				
Date: _____		Time: _____		
Room I				
Material:	HWTSE/Drum Group #:	Quantity:	Remarks:	
Room II				
Material:	HWTSE/Drum Group #:	Quantity:	Remarks:	
Room III				
Material:	HWTSE/Drum Group #:	Quantity:	Remarks:	

Comments: _____

Facility Inspector: _____

Attachment X-1

Checklist 4 - HWTSE Drum Storage Building Inspection (Weekly) (Cont'd)

Weekly Storage Building #2 Inspection				Page 2
Reactives – Oxidizers– PCB Materials Will Be Segregated in Rooms IV, V, & VI				
Date: _____		Time: _____		
Room IV				
Material:	HWTSE/Drum Group #:	Quantity:	Remarks:	
Room V				
Material:	HWTSE/Drum Group #:	Quantity:	Remarks:	
Room VI				
Material:	HWTSE/Drum Group #:	Quantity:	Remarks:	

Comments: _____

Facility Inspector: _____

XI. Training

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 - 3. Implementation of the Training Program
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 - 1. Organization
 - 2. Job Titles, Descriptions & Required Skills & Training
- C. Content of the Training Program
- D. Training Records
 - 1. Contents
 - 2. Location and Updating of Records
 - 3. Record Retention

List of Enclosures

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Figure XI-1	Present Organization of the Personnel at the HWTSF
Attachment XI-1	Training Course Outlines

XI. Training

A. HWTSE Training Program

1. Training Program Overview

The training program for the HWTSE is designed to instruct personnel in general and specific hazardous waste management procedures, safety and personal protection requirements, and emergency response actions. This training is provided at an introductory level within 6 months of assignment to the HWTSE, and on a continuing basis to ensure that procedures are properly followed and to evaluate the effectiveness of the training program. Employees that are involved with handling and management of hazardous wastes at the HWTSE are also required to complete a 24-hour OSHA course (29 CFR, §1910.120) within 6 months of placement within the HWTSE.

a) Initial Training

New HWTSE personnel attend an orientation program which familiarizes them with the layout of the HWTSE and the general operating procedures. They are then required to participate in training courses, of the amount and type specified for the position being filled, as shown on Table XI-1. They work under the guidance of qualified HWTSE personnel until they have demonstrated, both in the classroom and on the job that they are competent at performing their assigned tasks. This combination of initial classroom and on-the-job training ensures that the training provided meets the demands of the actual job tasks.

b) Continuing Training

Trained HWTSE employees participate in continuing (refresher) training on an annual basis. Continuing training consists of:

- Demonstrating knowledge of all material contained in the initial classroom courses required for their job training program, and
- Demonstrating the ability to perform the tasks necessary for their jobs safely and effectively.

2. HWTSE Training Director and Course Instructors

a) Training Director

The current HWTSE Supervisor directs the formalized training program at the HWTSE. The HWTSE Supervisor is trained in hazardous waste management procedures for the HWTSE, including specific procedures for operation of the five treatment and/or storage areas. The HWTSE Supervisor is also qualified to instruct any of the HWTSE training courses.

b) Course Instructors

Under the direction of the Training Director, the training program is administered by persons trained in hazardous waste management procedures, safety procedures, and emergency response procedures.

B. Personnel

1. Organization

The organization of the HWTSE includes adequate personnel to operate and maintain the general HWTSE and the individual treatment and storage areas/processes and required records. The HWTSE staff work under the direct supervision of the HWTSE Supervisor, or in his absence, under the supervision of the Chemical Cleaning Coordinator or the Hazardous Waste Technician. The HWTSE Supervisor, the Chemical Cleaning Coordinator, and the Hazardous Waste Technician must complete the same training requirements with respect to the management of hazardous waste. All HWTSE employees are required to have training in the duties specific to their position, as well as general safety and emergency response procedures. The present organization of the personnel at the HWTSE is shown in Figure XI-1.

2. Job Titles, Descriptions, and Required Skills and Training

a) *HWTSE Supervisor*

- Supervises, provides work direction, schedules labor and equipment for various company and contract personnel in order to operate the HWTSE.
- Reviews and approves all invoices and time sheets associated with operation of the HWTSE.
- Advises and provides guidance to the Hazardous Waste Technician in performing sampling duties.
- Coordinates with the Refinery concerning the storage and/or treatment of certain Refinery wastes.
- Responsible for the development and evaluation of new waste treatment technologies and methods to improve waste handling at the HWTSE.
- Responsible for all aspects of hazardous waste compliance at the HWTSE.

The HWTSE Supervisor must have knowledge of, or the resources to gain knowledge of, the physical and chemical characteristics of hazardous wastes produced by Refinery operations, as well as applicable federal, state, and local regulations. Prior to assuming the position of the new HWTSE Supervisor, the incoming individual must work under the supervision of the incumbent HWTSE Supervisor to become familiar with the operations of the HWTSE and the responsibilities of the position.

b) *Chemical Cleaning Coordinator*

- Directly supervises the chemical cleaning contractor foremen within the Refinery but outside of the HWTSE.
- Reviews and approves all chemical cleaning contractor time sheets and invoices.
- Coordinates the development of quality improvement in contractor personnel, procedures and equipment.
- Manages bulk carbon usage within the Refinery.
- Develops procedures and coordinates activities for all chemical cleaning operations performed in the Refinery.
- Acts as the HWTSE Supervisor in the event of the HWTSE Supervisor's absence.

Required Training and Skills

The Chemical Cleaning Coordinator must have knowledge of, or the resources to gain knowledge of, the physical and chemical characteristics of hazardous wastes produced by Refinery operations as well as applicable federal, state, and local regulations. This individual must attend the HWTSE Supervisors training course and maintain a working knowledge of all procedures followed and processes utilized at the HWTSE.

c) HWTSE Emergency Coordinator

The HWTSE Emergency Coordinator's responsibilities typically include:

- Communicating with operating divisions on hazardous waste matters.
- Security of the HWTSE.
- On-site contact for contractors when treatment activities occur on weekends or holidays.
- During the off-hour shifts acts as the HWTSE Emergency Coordinator which includes notifying proper personnel in case of an emergency involving hazardous waste and coordinating emergency activities until the emergency response team arrives.

Required Training and Skills

HWTSE Emergency Coordinators need to have a good working knowledge of Refinery processes and procedures. They must have knowledge of, or the resources to gain knowledge of, the physical and chemical characteristics of hazardous wastes produced by Refinery operations as well as applicable federal, state, and local regulations. Individuals in the position of HWTSE Emergency Coordinator must satisfactorily complete the HWTSE Emergency Coordinator training course, which includes safety and emergency response training.

d) Hazardous Waste Technician

General responsibilities:

- Helps develop and recommends modification as appropriate to the HWTSE Waste Analysis Plan.
- Maintains the HWTSE laboratory and performs various on-site analyses.
- Regularly audits chain-of-custody procedures.
- Regularly audits sampling procedures.
- Regularly audits analytical results to ensure compliance with regulatory and safety criteria.
- Gathers and records data pertaining to hazardous waste management compliance.
- Performs data analysis and organization as required to prepare compliance reports to regulatory agencies and maintain HWTSE records.
- Acts as the HWTSE Supervisor in the event of the HWTSE Supervisor's absence.

Required Training and Skills

The Hazardous Waste Technician must have good analytical and organizational skills in order to perform the many report and review tasks innate to this position. Before working unsupervised the Hazardous

Waste Technician must complete the Hazardous Waste Supervisor training course and be familiar with all of the analytical and sampling methods used at the HWTSF.

e) HWTSF Operators

The HWTSF employs contractor operators to handle, treat, and store hazardous waste. These operators are under the supervision of the HWTSF Supervisor. The responsibilities and duties of the HWTSF Operator are as listed below:

- Stores hazardous material in the proper containers and locations in the HWTSF.
- Labels containers of hazardous waste.
- Samples the hazardous waste.
- Determines the quantity of hazardous waste in containers in the HWTSF (by gauging or weighing).
- Performs the various treatment operations including mixing, transferring, filtering, etc.
- Maintains a clean and safe working environment.
- Performs emergency response activities including spill containment, spill cleanup, and incipient stage fire fighting assistance.

Required Training and Skills

The HWTSF operators are required to have training in pertinent sampling techniques, treatment processes and waste incompatibility. The personnel in this position must have knowledge of and understand the standard operating procedures of the HWTSF.

f) HWTSF Term Contractors

The HWTSF employs Term Contractors to perform specific hazardous waste treatment operations. These contractors are under the supervision of the Term Contractor Foreman. The responsibilities of the HWTSF Term Contractor are as follows:

- Performs various specific treatment operations including neutralization, dewatering, etc.
- Maintains a clean and safe working environment to comply with all Refinery and legal requirements.

Required Training and Skills

Prior skills will include the operation of the contractor's equipment used in the treatment process that the contractor has been contracted to perform.

g) HWTSF Maintenance Personnel

The HWTSF employs project contractors and/or Chevron maintenance personnel to perform remedial and preventative maintenance inside the HWTSF such as pump and electrical maintenance, and asphalt replacement on an as-needed basis. These persons are under the direct supervision of the HWTSF Supervisor.

Required Training and Skills

Special training is given to each individual based upon the specific assignment prior to performing work inside the HWTSF. Prior skills will include the use of equipment needed for the particular job function. These individuals are given site-specific training on potential site hazards, evacuation plans, and location of emergency safety equipment.

C. Content of the Training Program

Personnel working at the HWTSF receive training relevant to the duties they are required to perform, in accordance with the requirements of CCR Title 22, §66264.16 (a)(2). All employees working at the HWTSF are required to participate in safety and emergency response training. Training covers HWTSF-specific procedures for major emergencies as outlined in the Contingency Plan. Employees receive classroom instruction and participate in routine drills and hypothetical tests of the emergency procedures on a regular basis. This training is described in detail in the Contingency Plan and generally includes the following:

- Evacuation and proper response procedures in the event of a fire, explosion, or accidental release.
- Locations and use of emergency equipment, communication equipment, and alarm systems.
- Earthquake response.
- Shutdown of operations, both under normal and emergency conditions.
- Location and use of personal protective equipment.
- Location and use of safety and first-aid equipment.
- Accident prevention, such as proper handling of drummed waste.

The inspecting, repairing, and replacing of emergency monitoring equipment, personal protective equipment, and safety and first-aid equipment are conducted by the HWTSF Operator and approved by the acting HWTSF Supervisor.

1. Waste Cutoff Systems

There are no waste feed cutoff systems at the HWTSF; therefore, no training is required. No groundwater monitoring wells exist within the HWTSF site; therefore, there is no potential for accidental contamination of groundwater by any HWTSF operations. For this reason, personnel do not receive training in response for contamination of groundwater.

D. Training Records

1. Contents

In accordance with CCR Title 22, §66264.16(d) and 40 CFR, §264.16(d), records are maintained at the HWTSF with the following information:

- Job title and name of employee.
- Written job description, including required qualifications (education and skills) and responsibilities/duties assigned.

- Written description of the type and amount of both introductory and continuing training given to each person.
- Training records with completion dates.

2. Location and Updating of Records

The Training Plan and training summary records are located in the HWTSF Administrative Office. The HWTSF Supervisor is responsible for maintaining the records to ensure that they are updated regularly (monthly and as new hires arrive) according to CCR Title 22, §66264.16(d)(4) and 40 CFR, §264.16(d)(4).

3. Record Retention

In compliance with CCR Title 22, §66264.16(e) and 40 CFR, §264.16(e), records for current personnel are kept until closure of the HWTSF; training records on former employees are retained for 3 years from the date the employee last worked at the HWTSF.

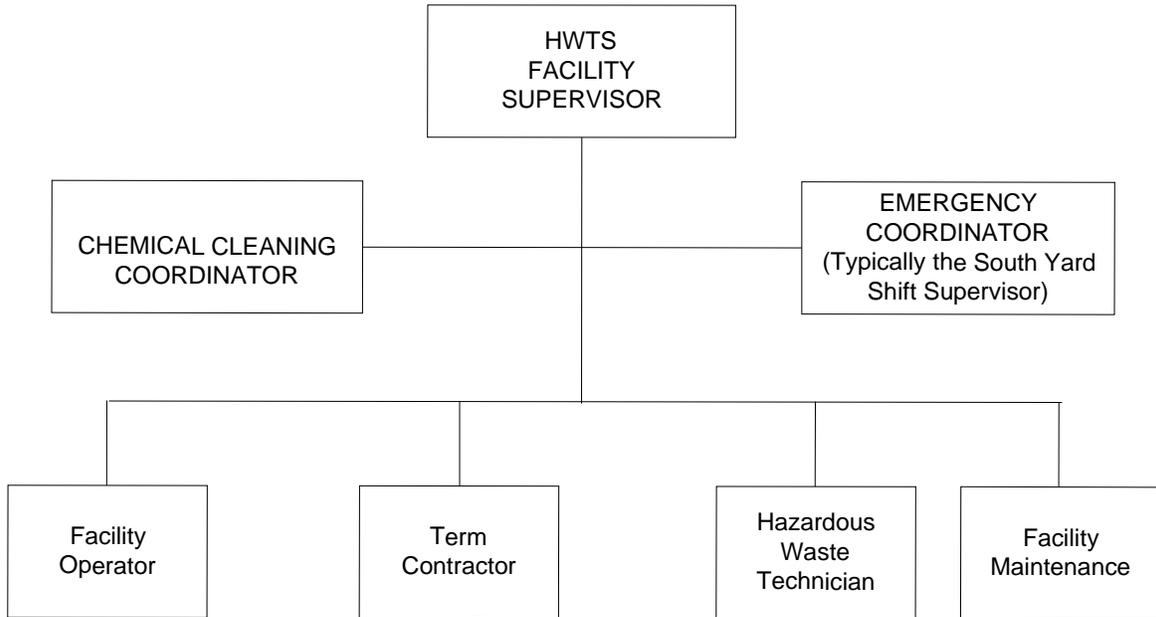
Table XI-1

Training Requirements for HWTSF Personnel

Position Title	Training Course Name			
	Hazardous Waste Supervisor	HWTSF Operator	HWTSF Term Contractor	HWTSF Maintenance
HWTSF Supervisor	X			
HWTSF Emergency Coordinator	X			
Chemical Cleaning Coordinator	X			
HW Technician	X			
HWTSF Operators		X		
HWTSF Term Operators			X	
HWTSF Maintenance Personnel				X
HWTSF: Hazardous Waste Treatment and Storage Facility				

Figure XI-1

Present Organization of the Personnel at the HWTSF



Attachment X1-1**Training Course Outlines**

- A. HWTSF Supervisor, Chemical Cleaning Coordinator, Hazardous Waste Technician, and HWTSF Emergency Coordinator Training
1. Introduction
 - a. Training Objectives, Rationale, Format
 2. Hazardous Waste Management
 - a. Waste Analysis Plan
 - b. Waste Acceptance
 - c. HWTSF Operations
 - d. Ignitable, Reactive, or Incompatible Wastes
 - e. Container Management
 - f. Treatment Overview
 - g. Decontamination Procedures
 - h. HWTSF Inspection Requirements
 - i. Recordkeeping and Reporting
 3. Emergency Response
 - a. The Contingency Plan
 - b. Procedures for Using, Inspecting, Repairing, and Replacing Emergency Equipment
 - c. Communication and Alarm Systems
 - d. Proper Response to Fires, Explosions, or Earthquakes
 - e. Shutdown of Operation
- B. Annual Refresher Training – HWTSF Supervisor, Chemical Cleaning Coordinator, Hazardous Waste Technician, and HWTSF Emergency Coordinator Training
1. Introduction
 - a. Training Objectives, Rationale, Format
 2. Hazardous Waste Management Review
 3. Emergency Response Review
 - a. The Contingency Plan
 - b. Procedures for Using, Inspecting, Repairing, and Replacing Emergency Equipment
 - c. Communication and Alarm Systems
 - d. Proper Response to Fires, Explosions, or Earthquakes
 - e. Shutdown of Operation
- C. HWTSF Operator Training
1. Introduction
 - a. Training Objectives, Rationale, Format

2. Hazardous Waste Management
 - a. Waste Analysis Plan
 - b. Waste Acceptance
 - c. HWTSF Operations
 - d. Ignitable, Reactive, or Incompatible Wastes
 - e. Container Management
 - f. Treatment Overview
 - g. Decontamination Procedures
 - h. HWTSF Inspection Requirements
 - i. Recordkeeping and Reporting
 - j. Sampling and Gauging Procedures
 - k. Miscellaneous Equipment Operations
 - l. Off-Hours Operations
3. Safety & Emergency Response
 - a. The Contingency Plan
 - b. Procedures for Using, Inspecting, Repairing, and Replacing Emergency Equipment
 - c. Communication and Alarm Systems
 - d. Proper Response to Fires, Explosions, or Earthquakes
 - e. Shutdown of Operation

D. HWTSF Operator Refresher

1. Introduction
 - a. Training Objectives, Rationale, Format
2. Hazardous Waste Management Review
3. Emergency Response Review
 - a. The Contingency Plan
 - b. Procedures for Using, Inspecting, Repairing, and Replacing Emergency Equipment
 - c. Communication and Alarm Systems
 - d. Proper Response to Fires, Explosions, or Earthquakes
 - e. Shutdown of Operation

E. HWTSF Term Contractor Training

1. HWTSF Operations
 - a. Chemical Treatment
 - b. Miscellaneous Equipment Operations
 - c. Off-Hours Operations
2. Safety and Emergency Response
 - a. Location & Use of Personal Protective Equipment
 - b. Contingency Plan Overview
 - c. Spill Response and Control
 - d. Emergency Evacuation Procedure/Alarm Testing
 - e. Use of Refinery Packset

F. HWTSF Term Contractor Refresher Training

1. Safety & Emergency Response
 - a. Location & Use of Personal Protective Equipment
 - b. Contingency Plan Overview
 - c. Spill Response and Control
 - d. Emergency Evacuation Procedure/Alarm Testing

G. HWTSF Maintenance Training

All company maintenance and maintenance project contractors who perform remedial and preventative maintenance inside the HWTSF fall under the direct supervision of trained HWTSF personnel. They need no special training other than to attend a tailgate safety meeting covering the follow:

1. Safety & Emergency Response
 - a. Location & Use of Personal Protective Equipment
 - b. Emergency Evacuation Procedure/Alarm Testing
 - c. Site Specific Hazards in Their Work Area

XII. Records and Reports

Table of Contents

- A. Maintaining Records and Reports
 - 1. Availability of Records for Agency Review
 - 2. Retention of Records
- B. Operating Record
 - 1. Written Records
 - 2. Maintenance and Retention of the Operating Record
 - 3. Contents of the Operating Record
- C. Accident Reports
- D. Land Disposal Restriction Notifications
- E. Subpart CC Non-Compliance Reporting
- F. Annual Hazardous Waste Report
- G. Contingency Plan Records
 - 1. Contingency Plan Implementation Record
 - 2. Chemical Analysis
 - 3. Written Report to DTSC
 - 4. Telephone Conversation Records

List of Enclosures

- Figure XII-1 On-Site LDR Notification Form
- Figure XII-2 EPA LDR Notification Form
- Figure XII-3 California LDR Notification Form
- Figure XII-4 Waste Tracking Form
- Figure XII-5 Treatment Form

XII. Records and Reports

A. Maintaining Records and Reports

The Hazardous Waste Treatment and Storage Facility (HWTSF) prepares and/or maintains the following main categories of records in compliance with CCR Title 22, Article 5:

- The HWTSF Operating Record
- Inspection Records
- Accident Reports
- Land Disposal Restriction Notifications
- Training
- The Annual Hazardous Waste Report
- Contingency Plan Implementation Records

1. Availability of Records for Agency Review

Chevron will make available and/or furnish records for inspection by any officer, employee, or representative of a government agency.

2. Retention of Records

Chevron will automatically extend the legally required retention period for all records during the course of any unresolved enforcement action regarding the HWTSF or as requested by the EPA or DTSC.

B. Operating Record

1. Written Record

The written Operating Record is made up of a series of forms and documents that record the day-to-day activities at the HWTSF. A description and an example of each of the forms utilized at the HWTSF to record and document all operating aspects of the HWTSF is described in Section "B3" below. Some of the forms shown are physically filed into the Operating Record. Other forms are samples of typical computer data formats.

2. Maintenance and Retention of the Operating Record

The HWTSF Supervisor is responsible for the maintenance and retention of the Operating Record. Monthly audits are performed to verify their completeness. The operating record will be maintained until closure of the HWTSF.

3. Contents of the Operating Record

a) *Waste Load Description Records and Receipts*

This consists of an Intra-Refinery trucking permit that must include:

- Job Number
- Date Waste Received
- Storage Location
- Attached Analytical or Documented Process Knowledge
- Special Instructions

b) *Waste Movement Records*

All waste movements in the HWTSF are tracked using a job numbering system in conjunction with a computer database. Figure XII-4 is an example of the typical computer form used to track waste container location and status.

c) *Treatment, Storage, and/or Disposal Records for Each Waste Load*

A job number is assigned to a waste load using the current characterization and/or analyses to break down the steps needed to store, treat and/or dispose of that waste.

Figure XII-5 is an example of the typical form used to enter/update the waste tracking database for the treatment process performed on a waste. When the treatment process has been completed, information such as the following becomes a permanent record.

- Job Number
- Treatment Type
- Date of Treatment
- Volume Treated

d) *Waste Analyses Records*

Records and results of the waste analyses performed on the wastes handled in the HWTSF will be kept at the HWTSF as part of the Operating Record.

Monitoring, testing, and analytical data records that are not required by the Waste Analysis Plan (Section VIII) but are used to monitor the various aspects of the HWTSF's operations are also filed in the operating record. These analyses are performed mainly for monitoring treatment effectiveness and ensuring that effluent discharge requirements are met and may or may not be performed at a certified laboratory, depending on the required analyses.

e) *Inspection Records*

See Section X for details of the Inspection Procedures.

A minimum of 3 years of inspection data is filed on-site in the Operating Record.

f) Training Records

Refer to the Training Plan in Section XI. Records of training are maintained and filed in the Operating Record.

C. Accident Reports

In the event that a personal injury accident occurs at the HWTSE, a report of the incident (from the refinery's incident database) and any investigation findings is filed in the Operating Record.

D. Land Disposal Restriction Notifications

Each time a waste that falls under the Land Disposal Restrictions (LDR) is transported to the HWTSE it must be accompanied by an on-site LDR Notification document. This document, which includes treatment standards and copies of the applicable analyses results, is filed in the HWTSE office building. Figure XII-1 is an example of a typical on-site LDR Notification document.

E. Subpart CC – Non-Compliance Reporting

Non-compliance is reported to the DTSC per the requirements in CCR Title 22, §66264.1090, including:

- 1) A written report within 15 days of discovery of a waste being placed in a container not complying with applicable standards. For example, a waste with a VO concentration greater than 500 ppmw stored in a non-compliant container, or a treated waste in a non-compliant container that failed to meet the treatment standards.
- 2) A semiannual written report describing any events where control devices operated for 24 hours or longer in non-compliance with their applicable standards. The report will only be submitted if such a non-compliance event did occur.

F. Annual Hazardous Waste Report

As required by CCR Title 22, §66264.75, the Annual Hazardous Waste Report is prepared and submitted every odd-numbered year. The Annual report is incorporated into the Biennial Hazardous Waste report (Title 22, CCR §66262.41) that is due every even-numbered year. Both reports are kept on file in the HWTSE office building or with environmental staff.

G. Contingency Plan Records

If the HWTSE Contingency Plan is implemented, the following records are filed in the Operating Record. The HWTSE Contingency Plan in Section XIII.

1. Contingency Plan Implementation Record

The Contingency Plan Implementation Record must be filled out and filed in the Operating Record. An example of this record is found in the Contingency Plan in Section XIII.

2. Chemical Analysis

Results from any chemical analyses performed in connection with a spill will be attached to this form.

3. Written Report to DTSC

Any incident which requires the implementation of the Contingency Plan will be reported in writing per the HWTSF Contingency Plan in Section XIII.

4. Telephone Conversation Records

The HWTSF Contingency Plan requires that telephone contact be made with various agencies in the event of certain emergency situations. Copies of these telephone conversation records are filed in the Operating Record.

Figure XII-1

On-Site LDR Notification Form

**ON-SITE NOTIFICATION
FOR
LAND DISPOSAL RESTRICTED (LDR) HAZARDOUS WASTE**

I. GENERATOR & TSD OPERATOR
Chevron U.S.A., Inc., Richmond Refinery
841 Standard Avenue
Richmond, CA 94802
EPA I.D. No. CAD 009114919

II. NOTIFICATION OF LDR HAZARDOUS WASTE:

The following hazardous waste is an LDR waste. It is to be stored and/or treated at the HWTS Facility:

Name of Waste: _____

RCRA Waste Code: _____

Non-RCRA Waste Code: _____

Waste Analysis: _____

(or attached copy of test results)

III. APPLICABLE TREATMENT STANDARDS (Refer to 40 CFR, §268):

<u>Waste Constituent</u>	<u>Treatment Standard</u>
_____	_____
_____	_____

(use additional page if necessary)

IV. MANAGEMENT OF WASTE:

The above hazardous waste was received at the Hazardous Waste Treatment and Storage Facility

on _____

(Date)

for _____

(Indicate: storage or treatment)

Generator: Field Supervisor or Representative

Operator: HWTS Supervisor or Representative

Figure XII-3

California Land Disposal Restriction Notification and Certification

Generator Name	Manifest Number
Generator Address	CWM Profile Number
California Hazardous Waste Code(s)	

This form is submitted to Chemical Waste Management, Inc. in accordance with the requirements of CCR Title 22, Division 4.5, Chapter 18, Article 1, which restricts the land disposal of certain hazardous wastes. I have marked the appropriate box (boxes A through D) below to indicate how my waste must be managed to conform to the land disposal restrictions. A copy of all applicable treatment standards and waste analysis data, where available, is maintained at the Chemical Waste Management facility identified on the manifest referenced above. I have entered the appropriate California Waste Code and checked the appropriate box in the table below to indicate the applicable non-RCRA hazardous waste listing from 22 CCR §66268.29.

<input type="checkbox"/>	State of California Restricted Waste Description Listed in 22 CCR §66268.29	Prohibition Implementation Date	Corresponding Treatment Standard (From 22 CCR)
	1 Metal-containing aqueous waste identified in 22 CCR §66268.29(a).	01/26/90	66268.107(a)
	2 Auto shredder waste identified in §66268.29(b).	05/08/91	66268.106(a)(1)
	3 Hazardous waste foundry sand identified in §66268.29(c).	01/01/91	66268.106(a)(2)
	4 Fly ash, bottom ash, retort ash or baghouse waste identified in §66268.29(d).	01/01/91	66268.106(a)(3)
	5 Baghouse waste from foundries identified in §66268.29(e).	01/01/91	66268.106(a)(4)
	6 Asbestos-containing waste identified in §66268.29(f).	03/01/93	66268.114

- A. RESTRICTED WASTE REQUIRES TREATMENT**
I am the generator of the waste identified above which must be treated to meet the applicable treatment standards set forth in CCR Title 22, Division 4.5, Article 4 or Article 11 of Chapter 18.
- B.1 RESTRICTED WASTE TREATED TO PERFORMANCE STANDARDS**
"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and that, based upon my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the performance levels specified in Article 4 and Article 11 of Chapter 18, Division 4.5, Title 22, CCR and all applicable prohibitions set forth in §66268.32 or RCRA §3004(d) [42 U.S.C. §6924(d)] without impermissible dilution of the prohibited waste. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment."
- B.2 RESTRICTED ASBESTOS WASTE TREATED TO PERFORMANCE STANDARD.**
"I warrant that I am an authorized representative of the generator. I certify under penalty of law that the waste complies with the treatment standards specified in CCR, Title 22, Division 4.5, Chapter 18, §66268.114. I believe that the information I submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment."
- C. RESTRICTED WASTE SUBJECT TO AN EXEMPTION [22 CCR §66268.7(a)(3)]**
The waste identified above is subject to a prohibition implementation date of _____.
- D. RESTRICTED WASTE CAN BE LAND DISPOSED WITHOUT TREATMENT**
"I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification, that the waste complies with the treatment standards specified in CCR Title 22, Division 4.5, Chapter 18, Article 4 and Article 11 and all applicable prohibitions set forth in CCR Title 22, §66268.32 or RCRA §3004(d) [42 U.S.C. §6924(d)]. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment."

I hereby certify that all information submitted in this and all associated documents is complete and accurate to the best of my knowledge and information.

Signature:	Date:
Authorized Representative Print Name:	Title:

Note: Generator address and printed name of authorized representative required for Box B.2

Figure XII-3 (Cont'd)

California Land Disposal Restriction Notification and Certification

CALIFORNIA LIST TREATMENT STANDARDS

If the waste identified on the other side of this form is described by any of the following USEPA hazardous waste codes: F001, F002, F003, F004, F005 and/or this hazardous waste is subject to any prohibitions identified as California List restrictions then this page MUST accompany the shipment, along with the opposite side of this form.

CALIFORNIA LIST TREATMENT STANDARDS - 22 CCR §66268.32, 22 CCR §66268.42 A waste must first be designated as a hazardous waste before the waste can be subject to the California List restrictions.		
Restricted waste description	Prohibition	Treatment Standard
Liquid* or non-liquid wastes containing Halogenated Organic Compounds listed in 22 CCR §66268 Appendix III or III-A	Liquid* wastes: Greater than or equal to 1,000 mg/L Non-liquid wastes: Greater than or equal to 1,000 mg/kg	22 CCR §66268.42(a)(2) - INCIN Prohibition implementation date 01/01/96 Health and Safety Code Division 20 §25179.7
Liquid* wastes containing PolyChlorinated Biphenyls (PCBs)	Greater than or equal to 50 ppm.	22 CCR §66268.42(a)(1) - INCIN or FSUBS Also see 40 CFR, §761.60 and 40 CFR, §761.70
Liquid* wastes containing Cyanides	Free (amenable to chlorination) cyanides at concentrations greater than or equal to 1,000 mg/L.	22 CCR §66268.32(a) Treated to pass Paint Filter Liquids Test.
Liquid* wastes containing Metals	One or more of the following metals (or elements) at concentrations greater than or equal to the following: Arsenic and/or compounds as As: 500 mg/L Cadmium and/or compounds as Cd: 100 mg/L Chromium and/or compounds as Cr: 500 mg/L Lead and/or compounds as Pb: 500 mg/L Mercury and/or compounds as Hg: 20 mg/L Nickel and/or compounds as Ni: 134 mg/L Selenium and/or compounds as Se: 100 mg/L Thallium and/or compounds as Tl: 130 mg/L	22 CCR §66268.32(a) Treated to pass Paint Filter Liquids Test.
Liquid* Acid wastes	pH less than or equal to 2.0	22 CCR §66268.32(a)

* For the definition of "liquid" refer to Method 9095, the Paint Filter Liquids Test from USEPA Manual SW-846.

* All treatment standards are expressed as mg/L constituent concentration in waste extract (Table CCWE 22 CCR ' 66268.41), unless otherwise indicated.

** Technology based standards from 22 CCR ' 66268.42

H Expressed as mg/L constituent concentration in waste (Table CCW, 22 CCR ' 66268.43)

HH Expressed as mg/Kg constituent concentration in waste (Table CCW, 22 CCR ' 66268.43)

Revised 10/19/99, Chemical Waste Management, Inc.
RIVERA C:\FILES\WP\FORMS\LDRFRM.1099

Figure XII-4 Waste Tracking Form

The screenshot shows the IHS Essential Suite interface for a Waste Tracking Form. At the top left is the IHS logo and the text "Essential Suite". On the top right, there is a "Resource Center" button and a help icon. Below the header, there are "Browse" and "Edit" buttons. The main form area is titled "General Job Information" and contains several sections:

- Job #:** Auto Number, **Status:** Requested (dropdown), and a **Job Control Report** button.
- Entity:** Chevron Richmond Refinery (dropdown with search icon).
- Requested By:** (dropdown).
- Request Date:** 03/24/2016 (calendar icon), **Job Start Date:** (calendar icon).
- Potential Completion Date:** (calendar icon), **Actual Completion Date:** (calendar icon).
- Entity Location:** (dropdown with search icon), **Point of Generation:** (dropdown with search icon).
- Source Description:** (text area).
- Project Name:** (dropdown with search icon).
- Waste Profile Assigned:** Section with a search icon and a checked checkbox for "Show Only Generic Profiles".
- Job Specific Special Handling Instruction:** (text area).

Below the main form is a "Contact Information" section with tabs for "Generator Information", "Draft Material Classification", "Job Log", "Waste Team/Contact Assignment", "Containers", "Samples", and "Links". The "Field Contacts" tab is active, showing "Field Contact", "Phone", and "Radio" input fields. A "Disable Tab View" link is located at the bottom right of the form area.

Figure XII-5
Treatment Form

Container Summary

Enterprise Entity: Chevron Richmond Refinery

Container #:

Container Type:

Waste Profile:

Quantity: Container Full

Process Unit:

Point of Generation:

Initial Storage Location:

Onsite Status: SARA Exempt RCRA Exempt

Initial Accumulation:

Date Full:

90 Day Storage:

Permitted Storage:

Container Designation | Container Contents | General Comments | Additional Information | Liquid Level | Disposal | Add Permits to Container | **Treatment Information** | Comment Log | Tracking Information

Treatment Information

Container must be saved before Treatment can be added

Date	Material	Quantity	Unit	Treatment Code
------	----------	----------	------	----------------

[Disable Tab View](#)

XIII. Contingency Plan

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HWTSF Contingency Plan

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**EMERGENCY PLANS
AND PROCEDURES**

**HAZARDOUS WASTE TREATMENT AND
STORAGE FACILITY CONTINGENCY PLAN**

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1.0 INTRODUCTION

1.1 This Plan is applicable to the Refinery Hazardous Waste Treatment and Storage Facility (HWTSF) and is designed to minimize hazards to human health or the environment from fires, explosions, or any release of hazardous waste or hazardous waste constituents to air, soil, or surface water. The Plan is written to comply with the requirements of all applicable regulations for Hazardous Waste Management found in Title 22, Division 4.5 of the California Code of Regulations (22 CCR).

1.2 General Information

Hazardous waste incidents are a small subset of the potential emergency situations that could occur in the Refinery. RI-400 details the Refinery Emergency Response Organization, and the responsibilities and authority of each member of the team. RI-434 and RI-470 describe the emergency communication systems and outside agencies notification procedures.

2.0 IMPLEMENTATION OF THE CONTINGENCY PLAN

2.1 This Plan shall be implemented immediately whenever there is a fire, explosion, or release of hazardous waste which could threaten human health or the environment. The decision to implement the Plan should only be made by the Emergency Coordinator identified in Section 3.1.

2.2 Implementation of this Plan is NOT required for responding to incidental releases of hazardous waste or hazardous constituents where the waste can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area or by Maintenance personnel.

Refer to Appendix VI, Decision Tree for Contingency Plan Implementation.

3.0 EMERGENCY COORDINATOR

3.1 It is the responsibility of the RSL (Refinery Shift Leader) or Management No. 1, as Emergency Coordinator, in consultation with HW Section personnel, to determine the degree of Refinery-wide response to hazardous waste incidents.

Should implementation of this Plan occur, the Emergency Coordinator will designate an HWTSF Emergency Coordinator using the call-out list in Appendix IV. This person will then carry out the emergency procedures as outlined in Section 6.0.

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At least one primary emergency coordinator is available at all times.

***3.2** Refer to RI-470 for Emergency Communications Systems

RI-470 includes a description and listing of the On-Call Emergency Personnel. An example of this list is provided in Appendix III of this Instruction. Individual names, addresses, and phone numbers of all on-call personnel are available at the Refinery Shift Leader's office and at the Chevron Fire Department Marshall's office.

In addition to the above, a call-out list of HW Section personnel is maintained (see Appendix IV) to address activation of the Hazardous Waste Facilities Contingency Plan.

4.0 NOTIFICATION AND REPORTS

4.1 If the HWTSF Contingency Plan is implemented, a Contingency Plan Implementation Record is generated and filed in the HWTSF Operations Record. An example of this form is in Appendix II.

4.2 Notification procedures for members of the Refinery First Response Organization and outside agencies are documented in Refinery Instructions RI-400, RI-434, and RI-470.

4.3 Within 15 days after an incident which requires implementation of this Plan, a written report must be submitted to the Department of Toxic Substances Control (DTSC). The report shall include:

1. Name, address, and telephone number of the owner or operator. This will be:

Chevron Products Co.
841 Chevron Way
Richmond, CA 94801
Phone: 510-242-3000
EPA ID No.: CAD009114919

2. Date, time, and type of incident (e.g., fire, explosion).

3. Name and quantity of material(s) involved.

4. The extent of injuries, if any.

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5. An assessment of actual or potential hazards to human health or the environment, where this is applicable.
6. Estimated quantity and disposition of recovered material that resulted from the incident.

5.0 IDENTIFICATION OF HAZARDOUS WASTE

5.1 All waste materials are identified in advance of loading or movement. Hazardous wastes in the Refinery are either in the process of being loaded, in containers, in transport, or at the HWTSF awaiting treatment or shipment for off-site management.

5.2 Identification of Wastes at the HWTSF

1. Step 1 - Identify the type of container:
 - a. Drum or Barrel - Go to Step 2.
 - b. Vacuum Truck - Go to Step 3.
 - c. Bin - Go to Step 4.
 - d. Portable Containers - Go to Step 5.
2. Step 2 - Drummed or Barreled Wastes:
 - a. If the barrel is marked with a commercial chemical product name, copy the product name from the drum and proceed to Step 6.
 - b. If the barrel is not marked with a commercial product name:
 - (1) Copy the HWTSF job number or Drum number.
 - (2) Contact the HWTSF Supervisor who will be able to determine the barrel contents from the HWTSF job number or Drum number, original MFG-3131, and other data from the computer data base. If the HWTSF supervisor is unavailable, use the call-out list in Appendix IV.
 - (3) Proceed to Step 6.

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3. Step 3 - Vacuum Truck Spills:
 - a. Get the Intra-Refinery Trucking Permit (MFG-3131) from the driver and proceed to Step 6.
 - b. Contact the head operator at the originating plant for more information if necessary.

4. Step 4 - Bins:
 - a. Contact the HWTSF Supervisor who will review existing data to determine the material in the bin. If the HWTSF Supervisor is unavailable, use the call-out list in Appendix IV and proceed to Step 6, or
 - b. Get the MFG-3131 or Daily HWTSF Inspection Report (filed in Room 21 at the HWTSF office) and proceed to Step 6.

5. Step 5 - Portable Containers:

Contact the HWTSF Supervisor who will review existing data to determine the material in the container. If the HWTSF Supervisor is unavailable, use the call-out list in Appendix IV.

6. Step 6 - Review the information on hand for the identification of hazardous components and the proper precautionary procedures for personnel protection and cleanup:
 - a. The Material Safety Data Sheet.
 - b. MFG-3131 (internal shipping document).
 - c. Originating plant head operator's information.
 - d. Advice from the Supervisor of Air Compliance Inspection and Hazardous Waste Management.
 - e. HWTSF Inspection Report, or the HWTSF Status Board located in the HWTSF Supervisor's office.

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6.0 ASSESSMENT OF ENVIRONMENTAL AND HEALTH IMPACTS

6.1 The primary tool for the assessment of potential hazards is the Material Safety Data Sheet (MSDS). Once the material is known, a copy of the MSDS should be obtained.

If an MSDS is not immediately available for the material in question, contact the area head operator where the material originated.

*6.2 A complete set of MSDSs is available in the Chevron Fire Department office, the HW Section library, and the Refinery Shift Leaders's office. Copies of MSDSs may also be accessed through the Refinery Information Server's online system (at msds-online.chevron.com). Copies of MSDSs for materials handled in each operating area are also available at each operating control room. Copies of purchased product Material Safety Data Sheets may be obtained from the Safety Section.

6.3 As a backup system, the information contained on MSDSs for Chevron materials may be obtained from the Refinery Information Server and on a 24-hour-a-day basis from Chevron Emergency Information Center (CEIC). See Appendix V for phone numbers. A toxicologist is also on-call for consultation.

*6.4 Information on wind speed and direction is available from computer monitors that are connected to the Refinery's intranet, using software that displays ground level monitoring data (for example, the H2S SO2 Overview in INDX) Wind socks are located at strategic locations throughout the Refinery, including the HWTSF.

7.0 CONTROL PROCEDURES

7.1 Container Rupture

The storage areas of the HWTSF are impounded to prevent the release of any spilled wastes from leaving the site and entering the environment. Should a container containing a volatile stock rupture, take the following steps:

1. By voice, notify all personnel to leave the area to an upwind location. Sound the evacuation alarm (See Section 10.1) and evacuate.
2. Notify the HWTSF Supervisor or designated backup per Appendix IV who will notify the Refinery Shift Leader and Chevron Fire Department. See Appendix V for phone numbers.

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3. The Chevron Fire Department will respond and block off roads if necessary.
4. When the area is deemed safe to enter by the HWTSF Emergency Coordinator, drain the ruptured container to the spare containers.
5. If possible, wash down residual material to the sump and remove using a bonded vacuum truck or portable pump. The material should be recovered on-site if possible or, if necessary, manifested to an off-site location.
6. Decontaminate the container. If the container is a drum, dispose of it in an authorized disposal location.

7.2 Fire or Explosion at HWTSF

1. Report the event to the Chevron Fire Department. The Chevron Fire Department will respond. See Appendix V for phone numbers.
2. By voice, notify all personnel to leave the area to an upwind location. Sound the evacuation alarm (see Section 10.1) and evacuate.
3. If possible, extinguish the fire, but do not endanger yourself. Put on a self-contained breathing apparatus if needed.
4. Notify the HWTSF Supervisor or designated backup per Appendix IV. The Refinery Emergency Coordinator will commence required notifications (see Section 4.1). See Appendix V for phone numbers.
5. Chevron Fire Department will block necessary roads.
6. After the fire has been extinguished, commence cleanup of the area:
 - a. Inspect all containers for any structural damage (bulging, cracks, etc.) and overhaul, replace, or transfer as necessary.
 - b. Contact Design Engineering Support to inspect and remedy any physical plant damage.
 - c. Remove debris and store in proper container.
 - d. Inspect, clean, and repair site drainage as necessary.

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7.3 Prevention of Recurrence

During an emergency, the HWTSF Emergency Coordinator shall take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other hazardous waste at the HWTSF. These measures shall include, where applicable, stopping processes and operations, collecting and containing released waste, and removing or isolating containers.

The HWTSF Emergency Coordinator shall review the status board inside the HWTSF Supervisor's office and other operating records to determine if incompatible waste is stored in the immediate vicinity, and if so, take action to prevent cross contamination.

Where appropriate, the HWTSF Emergency Coordinator shall monitor for leaks, pressure buildups, gas generation, etc., in response to the stopping of processes and operations.

7.4 Storage and Treatment of Released Material

Immediately after an emergency, it is the responsibility of the HWTSF Emergency Coordinator to properly store and possibly treat any material that results from a release, fire, or explosion at the HWTSF.

Reviewing the operating records will assist the Coordinator in the decision-making process.

7.5 Efficient Cleanup to Prevent Incompatibility

No waste that may be incompatible with the released material may be treated, stored, or disposed of until cleanup procedures are complete.

8.0 EMERGENCY EQUIPMENT

8.1 The HW Section maintains a list of all emergency equipment for the HWTSF (see Appendix I.) The list includes the name of equipment, location, physical description and a brief outline of its capabilities.

*8.2 The Chevron Fire Department maintains Refinery fire-fighting equipment which may be used by the Chevron Fire Department personnel and first response team when responding to an emergency call. Specific equipment details are available from the Chevron Fire Department Marshall. See Appendix V for phone numbers.

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- 8.3 Bins, vacuum trucks, drums, and bulk vessels are readily available through local contract rental companies.

9.0 COORDINATION AGREEMENT

- 9.1 The Richmond Refinery is fully equipped to respond to all emergencies:

1. Since 1983, the Richmond Refinery Chevron Fire Department has coordinated and participated in a continuing fire training program with the Richmond Fire Department.
2. A mutual aid agreement exists in which both fire departments agree to respond to emergencies when requested (in events where all resources for an organization are tied up a response may be delayed).
3. Chevron Richmond Refinery is a member of the Petro-chemical mutual organization. This organization is comprised of Industrial, Municipal, Government, and other private organizations with a focus on Emergency Mutual Aid assistance and sharing of lessons learned.

*9.2 Mutual Aid/Medical

1. The Chevron Richmond Refinery is a member of the Petrochemical Mutual Aid committee that includes the regional ambulance and air ambulance companies for this area. They are invited on-site for drills and training.
2. The Chevron Fire Department is a State-certified fire department with state certified firefighter/emergency medical technicians.

10.0 EVACUATIONS

10.1 Hazardous Waste Treatment & Storage Facility Evacuation

1. In the event of a fire, explosion, odor, release of hazardous waste, or hazardous waste constituents occurring outside of the HWTSF, refer to RI-480 for evacuation procedures.
2. During a fire, explosion, or release from the HWTSF, the HWTSF supervisor will assess the situation, and if necessary:
 - a. Activate the HWTSF Evacuation Alarm.

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- b. Evacuate personnel to primary evacuation area east of HWTSF near Gate No. 31 parking lot or secondary location in the U&E control room.
- c. Notify the Chevron Fire Department dispatcher and report an emergency. See Appendix V for phone numbers.
- d. Notify the Utilities and Environmental Shift Team Leader. See Appendix V for phone numbers.

11.0 AMENDMENT OF PLAN

This contingency plan will be amended as necessary whenever:

- Management #3 conducts an after-the-event critique of the response (required), and recommends amendments to the Plan,
- The HWTSF permit is revised,
- The HWTSF changes in a way that materially increases the potential for fires, explosions, or releases of hazardous waste or hazardous waste constituents, or changes the response necessary in an emergency,
- The list of Emergency Coordinators changes, or
- The list of emergency equipment changes.

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APPENDIX I HAZARDOUS WASTE TREATMENT AND STORAGE FACILITY CONTINGENCY PLAN

SAFETY AND EMERGENCY EQUIPMENT

Name*	Quantity Available	Location Area *	Description*	Use and Capabilities*
Hard Hat	Min. of 6 hats on hand at all times.	K	Protective head gear meeting MSA standards.	Issued to all employees and visitors. Provides protection from head injuries.
Goggles	Min. of 1 case on hand at all times.	K	Polycarbonate mono-goggles.	Issued to all employees, protects eyes from splashes and some projectiles.
Safety Glasses	Min. of 6 pair on hand at all times.	K	Impact-resistant glass eyeglasses.	Issued to all employees and visitors. Provides protection from direct frontal splashes and projectiles.
Gloves	Min. of 1 case on hand at all times.	K	PVC Knit liner.	Provides hands and wrists with protection against chemical exposures. Type of glove chosen depends on the fineness of work required and type of chemical exposure.
Boots	Min. of 6 pair on hand at all times.	K	PVC mid calf and overboots.	Provides protection to feet and lower legs from chemical exposures.
Protective Suits	Min. of 1 case on hand at all times.	K	Full body, Coated impermeable, and full body with hoods.	Provides protection to body from moderately hazardous chemical exposures (OSHA Level B and C protection).
Respirators	Min. of 6 pcs. on hand at all times.	K	Full-face cartridge respirators.	Provides protection to lungs and respiratory system from chemical exposures.
Self-contained breathing apparatus	4	A,E, F & M	Self-contained breathing apparatus with approximately 30 minutes of air in tanks.	Provides full respiratory and eye protection from highly toxic or low oxygen environments.

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SAFETY AND EMERGENCY EQUIPMENT

Name*	Quantity Available	Location Area *	Description*	Use and Capabilities*
Eyewash/Safety Shower	5	A,D,F,G & J	Standard industrial eyewash/safety shower combination.	Fixed and portable emergency washing facilities to water flush eyes or entire body to remove chemical contamination. Located near five hazard areas for immediate use by victims and/or assistants.
First Aid Kit	1	J	Standard industrial first aid kit.	Provides emergency first aid equipment to HWTSF personnel.
Fire Extinguishers	8	A,B,F, & K	Various industrial rated fire extinguishers, including: dry chemical fire extinguishers, water/foam units, and dry chemical on wheels, unpressurized.	Portable emergency fire extinguishers, located in five potentially hazardous areas for immediate use by HWTSF personnel.
Evacuation Sirens	2	A	Edwards GS duotonic 13V siren or equivalent.	Emergency evacuation device used to notify HWTSF personnel and guests of impending danger and to evacuate the HWTSF immediately.
Gas Detector	2	J	Hand-held electronic units.	Measures lower explosive limit (LEL), oxygen, hydrogen sulfide, and carbon monoxide. Includes warning alarm when 25% of the LEL is reached.
Hydrogen Sulfide Indicator	1	J	Lead acetate paper.	Detects presence of hydrogen sulfide.
Gas Detector	1	J	Hand-held pump and tube.	Measures the presence of ammonia, hydrogen sulfide, carbon monoxide, and benzene with color reactive cartridges.
pH Paper	1	J	Litmus paper.	Color reactive paper that can measure the pH between 0-13.

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SAFETY AND EMERGENCY EQUIPMENT

Name*	Quantity Available	Location Area *	Description*	Use and Capabilities*
Generators	As Needed	Refinery Tool Room	Diesel powered.	Backup power supply used during power outages.
Portable Lights	As Needed	Refinery Tool Room	Diesel powered portable lighting system.	Backup portable lighting system used during power outages.
MSDS	As Needed	HWTSF Office	Describes components of waste and associated hazardous property.	Available for use by all employees to describe hazardous properties and assist in determining handling/storage methods.
Spill control pillows	Several Cases Available at All Times	K	Spill response and control pillows constructed of synthetic absorbent material.	Each pillow can absorb up to 250 ml of spilled liquid waste material.
Oil spill control booms	Several Cases Available at All Times	K	*Spill response and control booms, typically constructed of synthetic material.	*Booms which can contain and control liquid waste spills up to 8" deep and 10' wide.
Oil spill control sheets	Several Cases Available at All Times	K	Spill response and control sheets.	Each sheet can cover an area up to 2.5 sq. feet, for hazardous solid waste storage/spill, to protect the subsurface from potential contamination.
Dam kit / temporary bbl dike	4	K	Spill response and control dam kit and temporary bbl dike constructed of polyethylene.	Each kit can contain and control a liquid waste spill that is 4" deep by 4-feet wide.
Hazardous material bags	Several Cases Available at All Times	K	Polyethylene hazardous material bags.	Each polyethylene bag can contain up to 1.5 cu. feet of solid hazardous wastes and should not be used for liquid wastes or wastes incompatible with plastic.

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APPENDIX I HAZARDOUS WASTE TREATMENT AND STORAGE FACILITY CONTINGENCY PLAN

SAFETY AND EMERGENCY EQUIPMENT

Name*	Quantity Available	Location Area *	Description*	Use and Capabilities*
Shovel	1	K	Non-sparking shovel, made of polyethylene or similar material.	Non-sparking shovel is used to scoop up highly flammable liquid and solid hazardous wastes in hard to reach areas or cleanup of residuals.
Hand pumps	2	K	*Chemically resistant hand pumps made of polyethylene or similar material.	Used to pump liquid wastes in the event of a mechanical pump failure and into vacuum trucks in the event of a spill. Pumps can safely handle corrosive and petroleum-based products.
Floor Dry	Pallet	B	*Granular-sized absorbent material, typically packed in 25 or 50 lb bags, 50 bags to a pallet. .	An all-purpose absorbent used to contain and control liquid hazardous spills.

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**EMERGENCY PLANS
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**APPENDIX II
HAZARDOUS WASTE TREATMENT AND
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CONTINGENCY PLAN IMPLEMENTATION RECORD

DATE: _____ TIME: _____

NATURE OF INCIDENT: Check one or more.
 FIRE EARTHQUAKE EXPLOSION RELEASE

DESCRIPTION OF INCIDENT: _____

NAME AND QUANTITY OF RELEASED MATERIAL: _____

EXTENT OF INJURIES (IF ANY): _____

ASSESSMENT OF ACTUAL OR POTENTIAL HAZARDS TO HUMAN HEALTH OR
THE ENVIRONMENT (WHERE APPLICABLE): _____

ESTIMATED QUANTITY AND DISPOSITION OF RECOVERED MATERIAL THAT
RESULTED FROM THE INCIDENT: _____

HWTS FACILITY EMERGENCY COORDINATOR: _____

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APPENDIX III HAZARDOUS WASTE TREATMENT AND STORAGE FACILITY CONTINGENCY PLAN

REFINERY MANAGEMENT WEEKLY EMERGENCY ON-CALL LIST FROM 00/00/01 THRU 00/00/01
***E-MAIL Emergency Services Office Asst.--YNZI@CHEVRON.COM for CHANGES**

<u>*Division</u>	<u>Name</u>	<u>*Work Ext.</u>	<u>*Cell Phone</u>
Management #1	_____	_____	510-815-5431
Management #2	_____	_____	510-815-5409
Management #3	_____	_____	510-815-5405
Management #4	_____	_____	510-815-5401
Communications	_____	_____	510-815-5432
Oil Spill I/C	_____	_____	_____
¹ Public/Env. Aff.	_____	_____	_____
Pub. Aff. Mgr.	_____	_____	_____
Pub. Affairs	_____	_____	_____
Pub. Affairs	_____	_____	_____
Environmental	_____	_____	_____
Safety ⁴	_____	_____	_____
RSL	<u>(All Shift Cov.)</u>	2-5050	510-815-5052
FOS (ERTC)	<u>(All Shift Cov.)</u>	2-2689	510-719-7754
Hydro - STL	<u>(All Shift Cov.)</u>	2-2327	510-815-5036
D&R - STL	<u>(All Shift Cov.)</u>	2-2957	510-815-1477
Utilities – STL	<u>(All Shift Cov.)</u>	2-2102	510-815-1034
Cracking – STL	<u>(All Shift Cov.)</u>	2-2068	510-815-1164
B&S – STL	<u>(All Shift Cov.)</u>	2-2445	510-815-5020
Maintenance On Call.	_____	905	510-697-0399

SAMPLE

*REVISED: 03/13 (Replaces 02/08)
 Certified as current and accurate: 03/13

RICHMOND REFINERY INSTRUCTIONS

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APPENDIX III HAZARDOUS WASTE TREATMENT AND STORAGE FACILITY CONTINGENCY PLAN

<u>*Division</u>	<u>Name</u>	<u>*Work Ext.</u>	<u>*Cell Phone</u>
RLP	_____	_____	_____
³ Control Systems	_____	_____	_____
³ Info Technology	_____	_____	_____
Inspections	_____	_____	_____
Trans Specialist	_____	_____	_____
Marketing Trk Rk	_____	_____	_____
CITC Contact – Phones	_____	_____	_____
Chev. Shipping Co.	_____	_____	_____
C.E.M.C. (Chev-Chem)	_____	2-8126	925-640-5733
Purchasing	_____	_____	_____
Nalco	_____	_____	_____

***Please report Notify System performance on Thursday’s 8 p.m. test by responding to the Management On Call notification.**

1 Anytime Environmental is called out, the Public Affairs Manager must also be called.

2 Send a notification to Safety when an injured employee or contractor requires medical treatment at an outside hospital or clinic.

3 Control Systems are those that directly interface to the plant equipment (i.e., Honeywell, PLC’s, CCC, SCADA, Egatrol, Triconex, FSC, Taylor/COSMIC, etc.). All other computer systems are part of Information Technology.

CHSD On Call 925-677-6700. Call on RSL instructions only. HR Callout –

RICHMOND REFINERY INSTRUCTIONS

**EMERGENCY PLANS
AND PROCEDURES**

**APPENDIX III
HAZARDOUS WASTE TREATMENT AND
STORAGE FACILITY CONTINGENCY PLAN**

***When making a change to the Weekly On-Call Schedule:**

- Please e-mail the Envir. Services Office Assistant at ynzi@chevron.com as far in advance as possible.
- If unable to notify the Office Assistant, please contact the Firehouse at ext. 2-4200 and the RSC at ext. 2-5050.

Thank you.

RICHMOND REFINERY INSTRUCTIONS

EMERGENCY PLANS AND PROCEDURES

APPENDIX IV HAZARDOUS WASTE TREATMENT AND STORAGE FACILITY CONTINGENCY PLAN

HWTSF EMERGENCY COORDINATORS IN ORDER OF CALL-OUT PREFERENCE

	<u>Work Phone</u>	<u>*Cell Phone</u>	<u>Refinery Radio</u>
Hazardous Waste Section Treatment & Storage HWTSF Supervisor	242-2292	*510-812-0664	320
Typically the on-site U/E Shift Team Leader	242-2102	*510-815-1034	*716
Chemical Cleaning Coordinator	242-3349	*510-812-0666	325
Hazardous Waste Sampling/Manifest Technician	242-5473	-	317

RICHMOND REFINERY INSTRUCTIONS

EMERGENCY PLANS AND PROCEDURES

APPENDIX V HAZARDOUS WASTE TREATMENT AND STORAGE FACILITY CONTINGENCY PLAN

PHONE NUMBERS USED WITH THIS CONTINGENCY PLAN

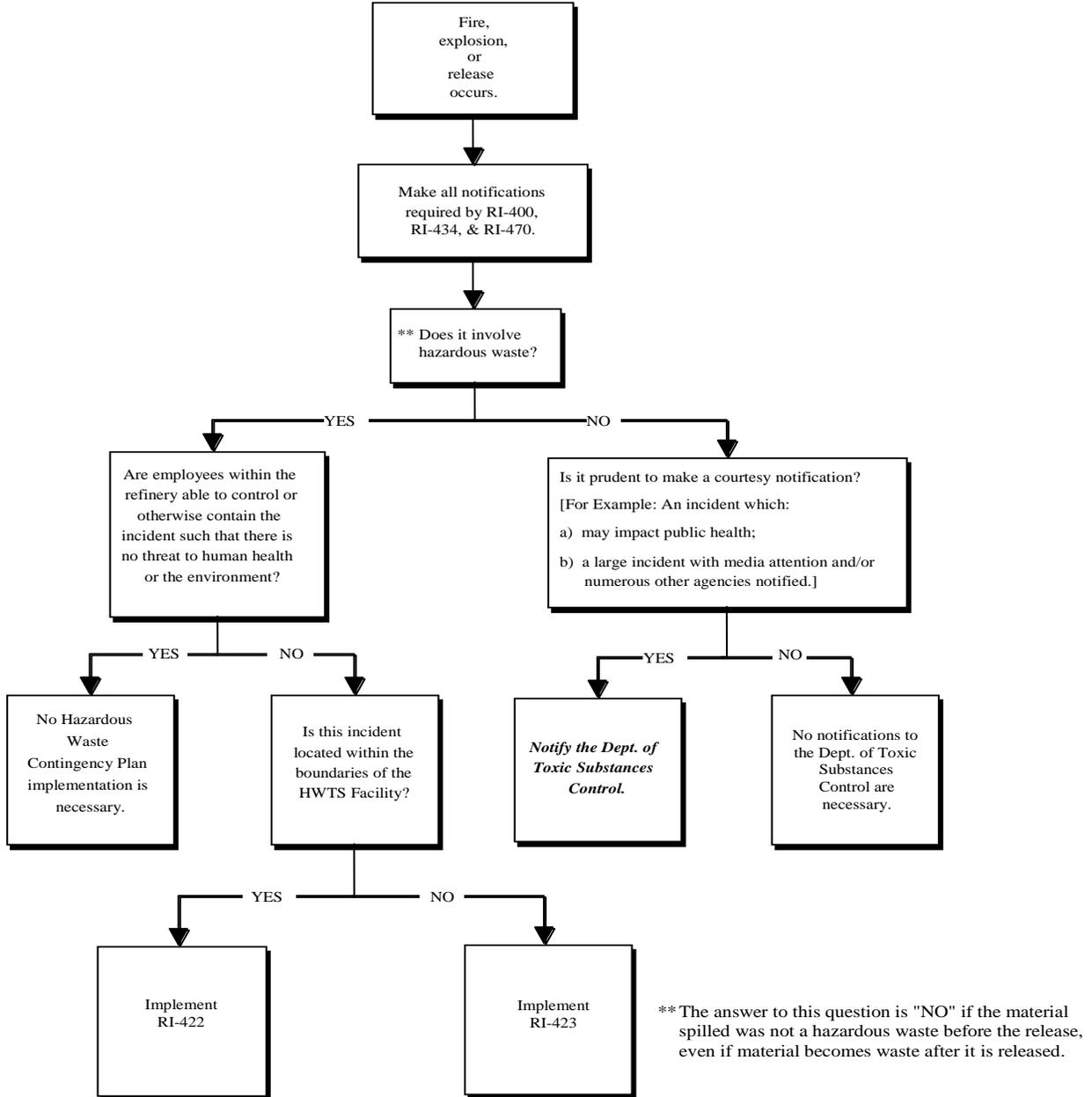
Title of Person	Phone Number	Radio	Cell Phone
U/E Shift Team Leader	242-2102	*716	*510-815-1034
CEIC, Chevron Emergency Information Center	800-231-0623		
*Chevron Fire Department Fire Marshall	242-4200 or 242-2302		
Chevron Fire Department	555	1A	
Supervisor of Air Compliance Inspection and Hazardous Waste Management.	242-4850	N/A	*510-710-7338
Hazardous Waste Section Solid Specialist	242-3676	324	N/A
Hazardous Waste Section Liquids Specialist	242-2294	322	
State Offices of Emergency Services	800-852-7550 or 916-262-1621		

RICHMOND REFINERY INSTRUCTIONS

EMERGENCY PLANS AND PROCEDURES

APPENDIX VI HAZARDOUS WASTE TREATMENT AND STORAGE FACILITY CONTINGENCY PLAN

DECISION TREE FOR CONTINGENCY PLAN IMPLEMENTATION

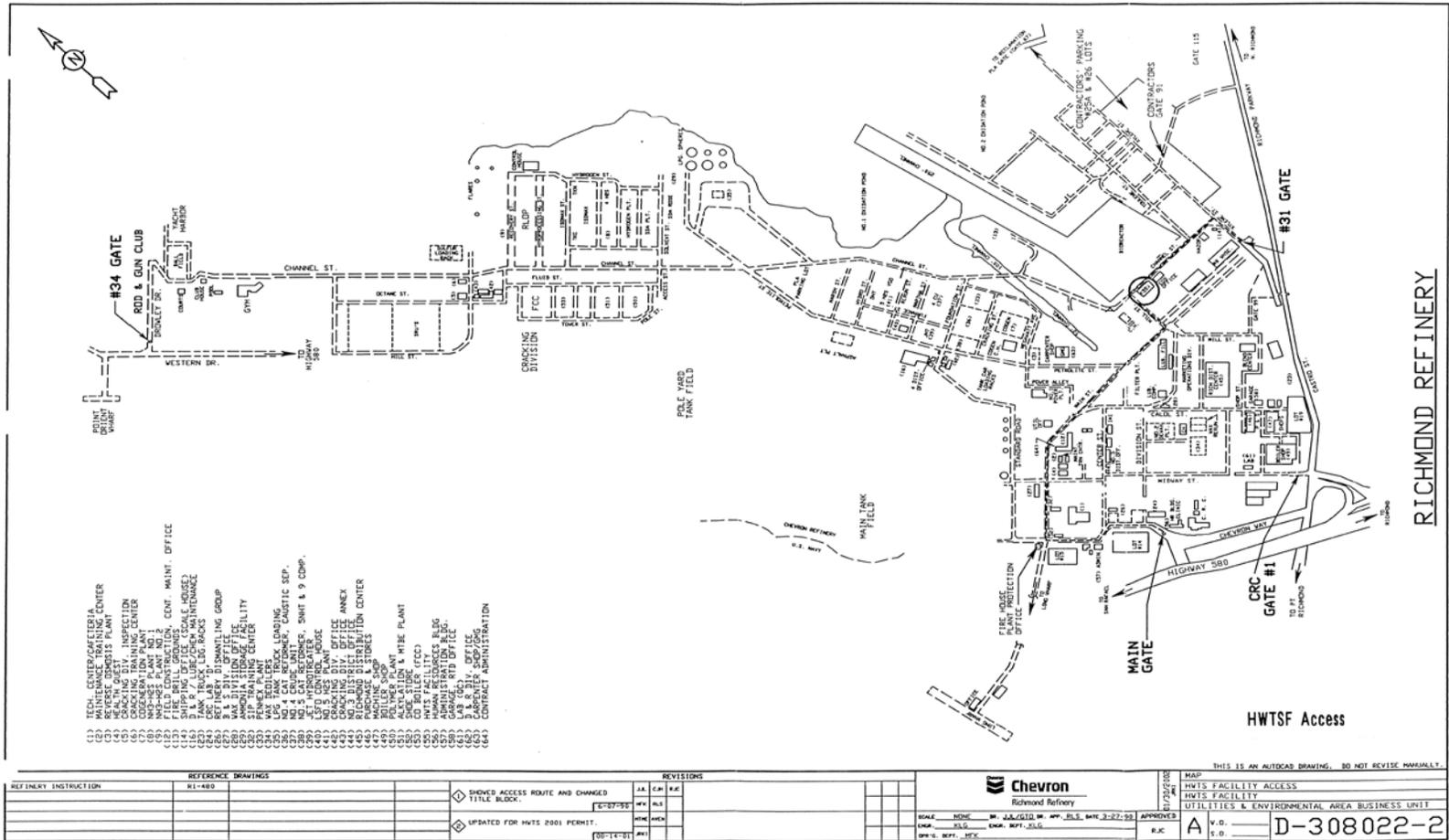


RICHMOND REFINERY INSTRUCTIONS

**EMERGENCY PLANS
AND PROCEDURES**

**APPENDIX VII
HAZARDOUS WASTE TREATMENT AND
STORAGE FACILITY CONTINGENCY PLAN**

MAP OF REFINERY AND HWTSF ACCESS



*REVISED: 03/13 (Replaces 02/08)
 Certified as current and accurate: 03/13

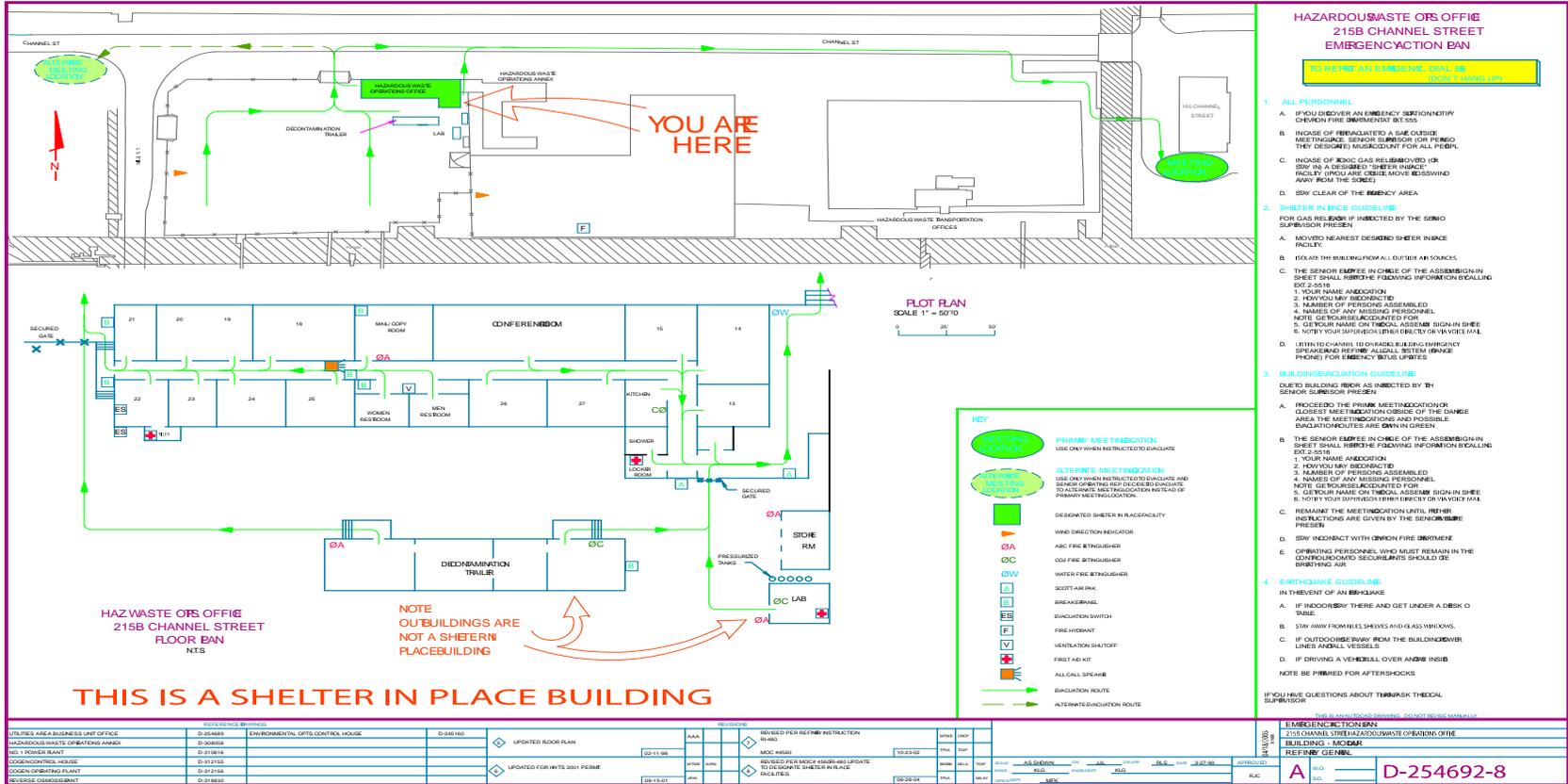
RICHMOND REFINERY INSTRUCTIONS

APPENDIX VII

EMERGENCY PLANS AND PROCEDURES

HAZARDOUS WASTE TREATMENT AND STORAGE FACILITY CONTINGENCY PLAN

MAP OF HWTSF AND OFFICE EMERGENCY ACTION PLAN



*REVISED: 03/13 (Replaces 02/08)
Certified as current and accurate: 03/13

XIV. Maps

Table of Contents

Map #	Name of Map	Map CAD #
1.	Aerial Overview Map	D-342940-1
2.	HWTSF, Water Lines, Secondary Containment	D-342941-3
3.	HWTSF, Emergency Equipment	D-342942-2
4.	Groundwater Monitoring Wells, Piezometers	D-342943-1
5.	Richmond Refinery Plants	D-308022-3
6.	Local Zoning Map	N/A
7.	"A-Zone" Water Table Contour Map	D-342945-1
8.	"C-Zone" Water Table Contour Map	D-342946-1
9-a 9-b 9-c 9-d	Flood Insurance Rate Maps	N/A
10.	Areas I and II	D-308001-4
11.	Area III	D-308002-3
12.	Areas IV and V	D-308003-3
13.	Area II Detailed Map	D-342985-1
14.	Wind Rose	N/A

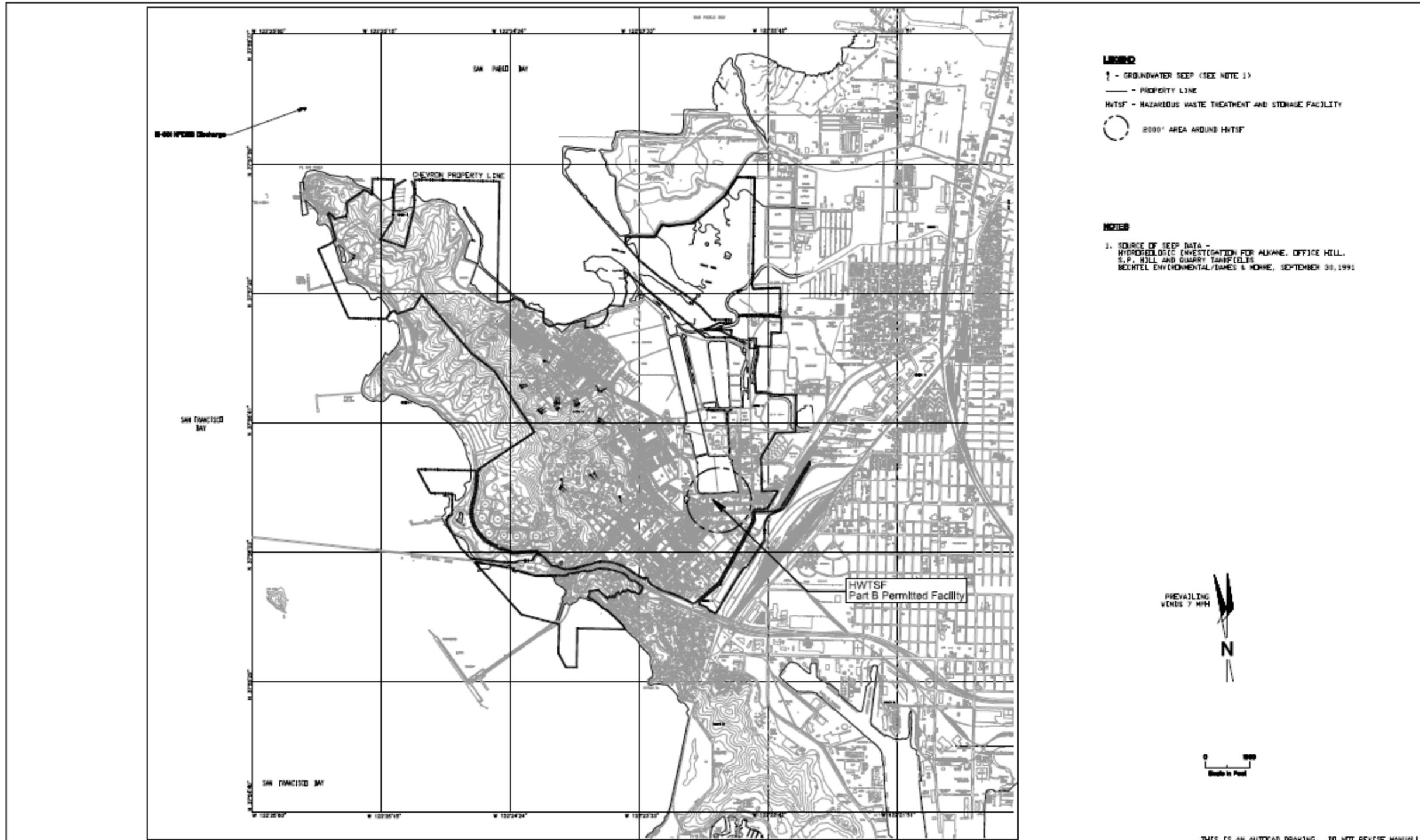
XIV. Maps

This section of the Operation Plan for the HWTsf describes and presents the various maps associated with the Chevron Richmond Refinery HWTsf.

Regulatory Requirement 66270.14 (b) (18)	Compliance	
<p>A topographic map showing a distance of 2000 feet around the Facility at a scale of 2.5 centimeters (1 inch) equal to not more than 61.0 meters (200 feet). Contours shall be shown on the map. The contour interval shall be sufficient to clearly show the pattern of surface water flow in the vicinity of and from each operational unit of the Facility. For example, contours with an interval of 1.5 meters (5 feet), if relief is greater than 6.1 meters (20 feet), or an interval of 0.6 meter (2 feet), if relief is less than 6.1 meters (20 feet). Owners and operators of hazardous waste management facilities located in mountainous areas should use larger contour intervals to adequately show topographic profiles of facilities.</p> <p>The map shall clearly show the following:</p>	<p>Map #1 is a U.S. Geological Survey (USGS) topographic map showing the entire Chevron Richmond Refinery and surrounding area. The map has been developed from an 1990 aerial photograph that was electronically digitized. Surface relief within the mapped area is less than 2 feet and therefore no contours fall within the mapped area. Map XIV-#2 includes contours of the paved surface of the HWTsf. The contour internal is 0.5 foot.</p>	
<ul style="list-style-type: none"> • Map scale and date 	<p>Indicated on all maps (or marked NTS)</p>	
<ul style="list-style-type: none"> • 100-year floodplain area 	<p>See Maps #9a & #9b</p>	<p>The HWTsf is not located within the 100-year floodplain. For more information, see Section XVI.</p>
<ul style="list-style-type: none"> • Surface waters including intermittent streams 	<p>See Map #1</p>	<p>There are no lakes, reservoirs, or rivers within the Refinery area nor within 1 mile of the Refinery. Intermittent streams within the mapped area have been highlighted.</p>
<ul style="list-style-type: none"> • Surrounding land uses 	<p>See Map #6</p>	
<ul style="list-style-type: none"> • Wind rose (i.e., prevailing wind speed and direction) 	<p>See Map #14</p>	
<ul style="list-style-type: none"> • Orientation of the map (north arrow) 	<p>Included on all maps</p>	
<ul style="list-style-type: none"> • Legal Boundaries of the HWTsf 	<p>See Map #2</p>	
<ul style="list-style-type: none"> • Access Control (Fences, Gates) 	<p>See Map #3</p>	

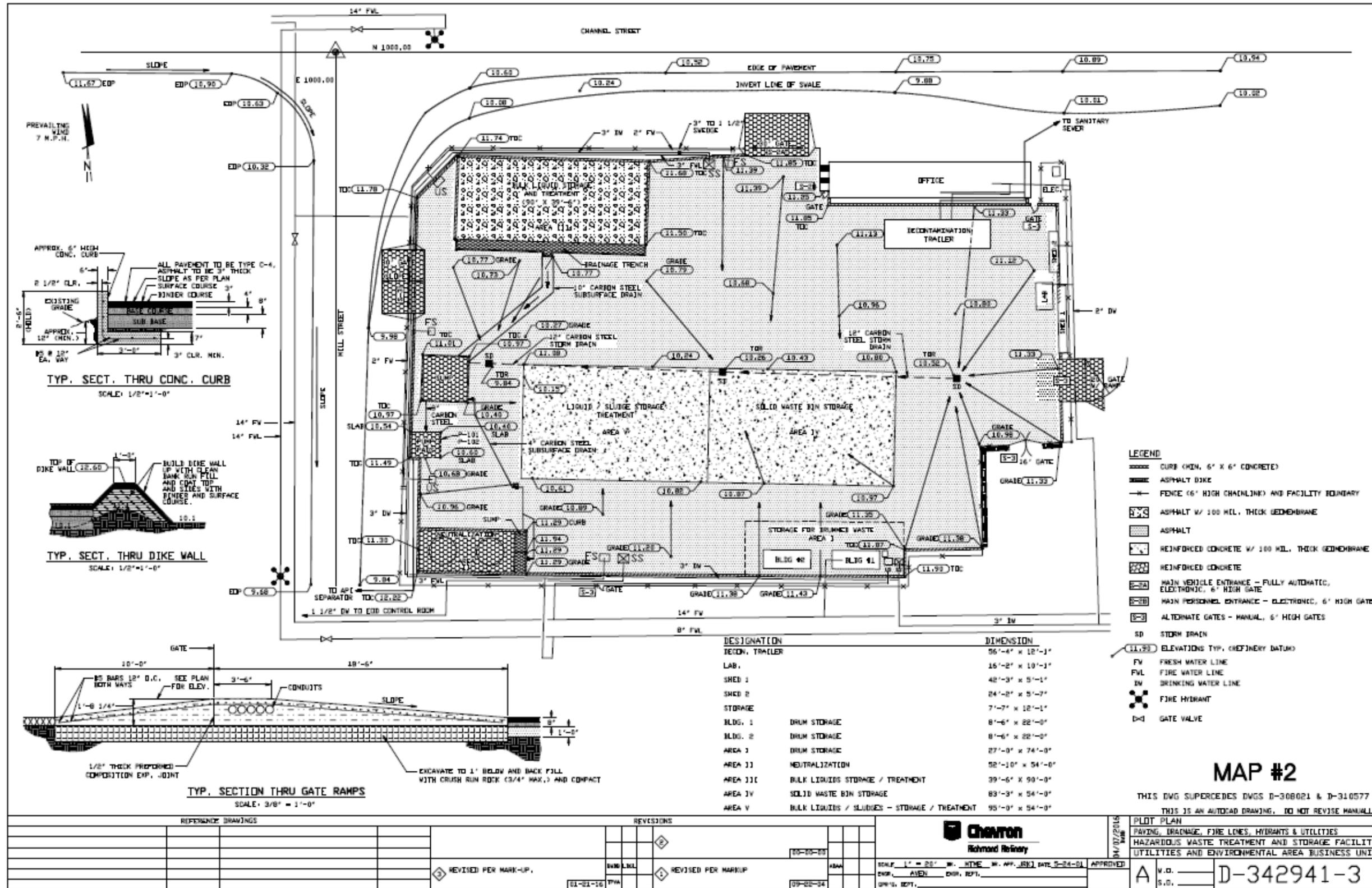
<ul style="list-style-type: none"> • Injection and Withdrawal Wells Both Onsite and Offsite 	Not Applicable	There are no wells used for the underground injection of fluids at the Refinery.
<ul style="list-style-type: none"> • Buildings 	See Map #2/3	
<ul style="list-style-type: none"> • Transfer, Treatment, or Storage Operations 	See Map #2/3	
<ul style="list-style-type: none"> • Barriers for Drainage or Flood Control 	See Map #2	
<ul style="list-style-type: none"> • Location of Operational units within the site 	See Map #2/3	

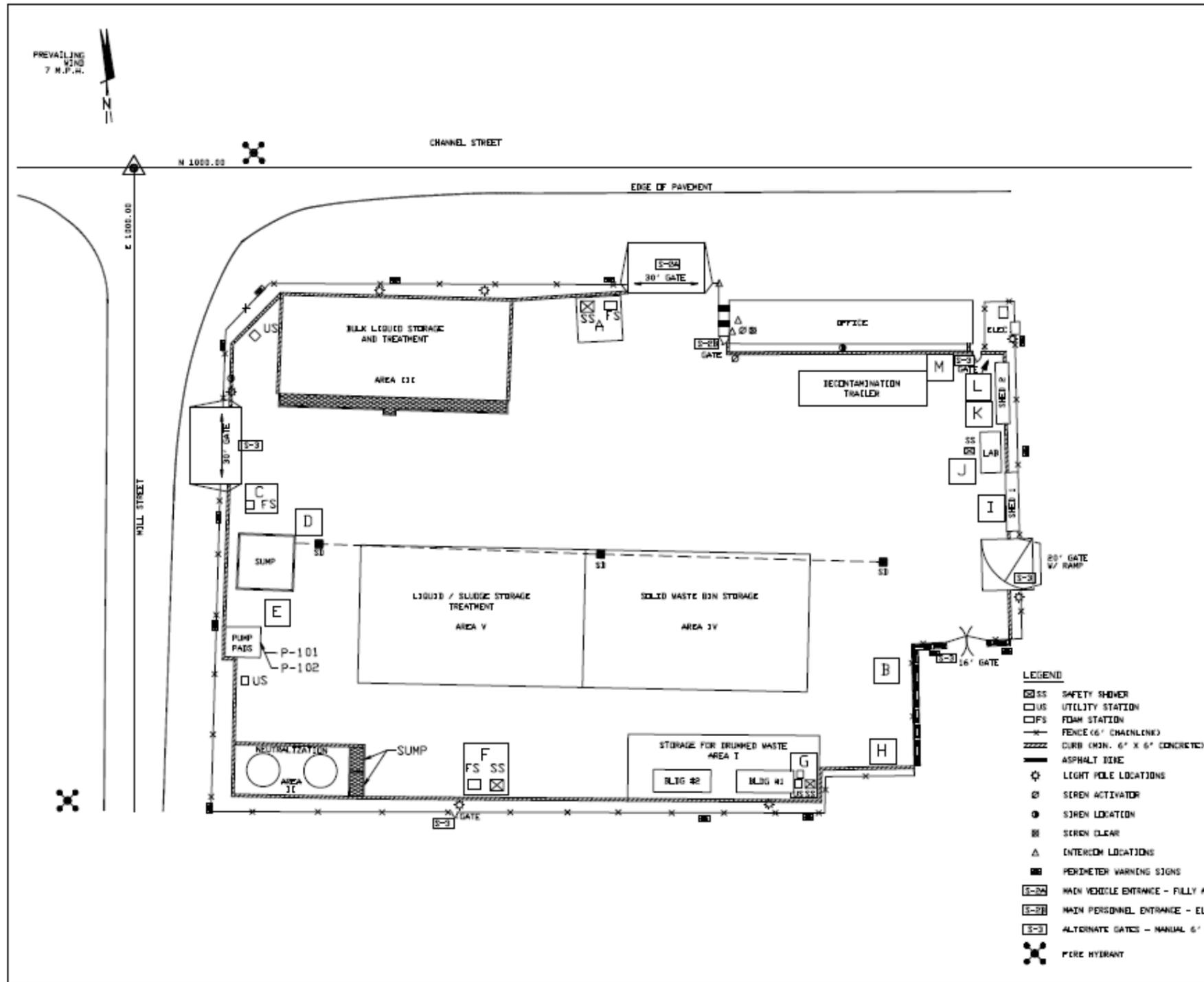
Regulatory Requirement 66270.13 (l)	Compliance	
A topographic map extending one mile beyond the property boundaries of the source, depicting the facility and each of its intake and discharge structures; each of its hazardous waste transfer, treatment, storage, or disposal facilities; each well where fluids from the facility are injected underground; each building and its use; and those wells, springs, other surface water bodies, and drinking water wells listed in public records or otherwise known to the applicant within 1/4 mile of the facility property boundary:	See Map #1.	
1. Springs	Not Applicable	There are no springs within the Refinery area nor within 1 mile of the Refinery boundaries.
2. Wells and Drinking Wells	Not Applicable	There are no water supply wells within the Refinery area and there are no known water supply wells within 1 mile of the Refinery boundaries.
3. Other Surface Water Bodies	See Map #1	The shoreline of tidal waters within the area of the figure has been highlighted. There are no lakes, reservoirs, or rivers within the Refinery area nor within 1 mile of the Refinery. Intermittent streams within the mapped area have been highlighted.



REFERENCE DRAWINGS				REVISIONS				 Richmond Refinery		MAP DISCHARGE LOCATIONS & DRAINAGE AREAS HAZARDOUS WASTE TREATMENT AND STORAGE FACILITY UTILITIES AND ENVIRONMENTAL AREA BUSINESS UNIT	
				1	REVISED FOR MARK-UP	04-07-16	PHM	SCALE 1"=1000'-0" N. N.T.M.E. W. APP. JUNE DATE 5-22-01	APPROVED	A	V.D. _____
								ENR. AVEEN	ENR. RPT.		S.D. _____
								DNV. IDPT.			D-342940-1

MAP #1



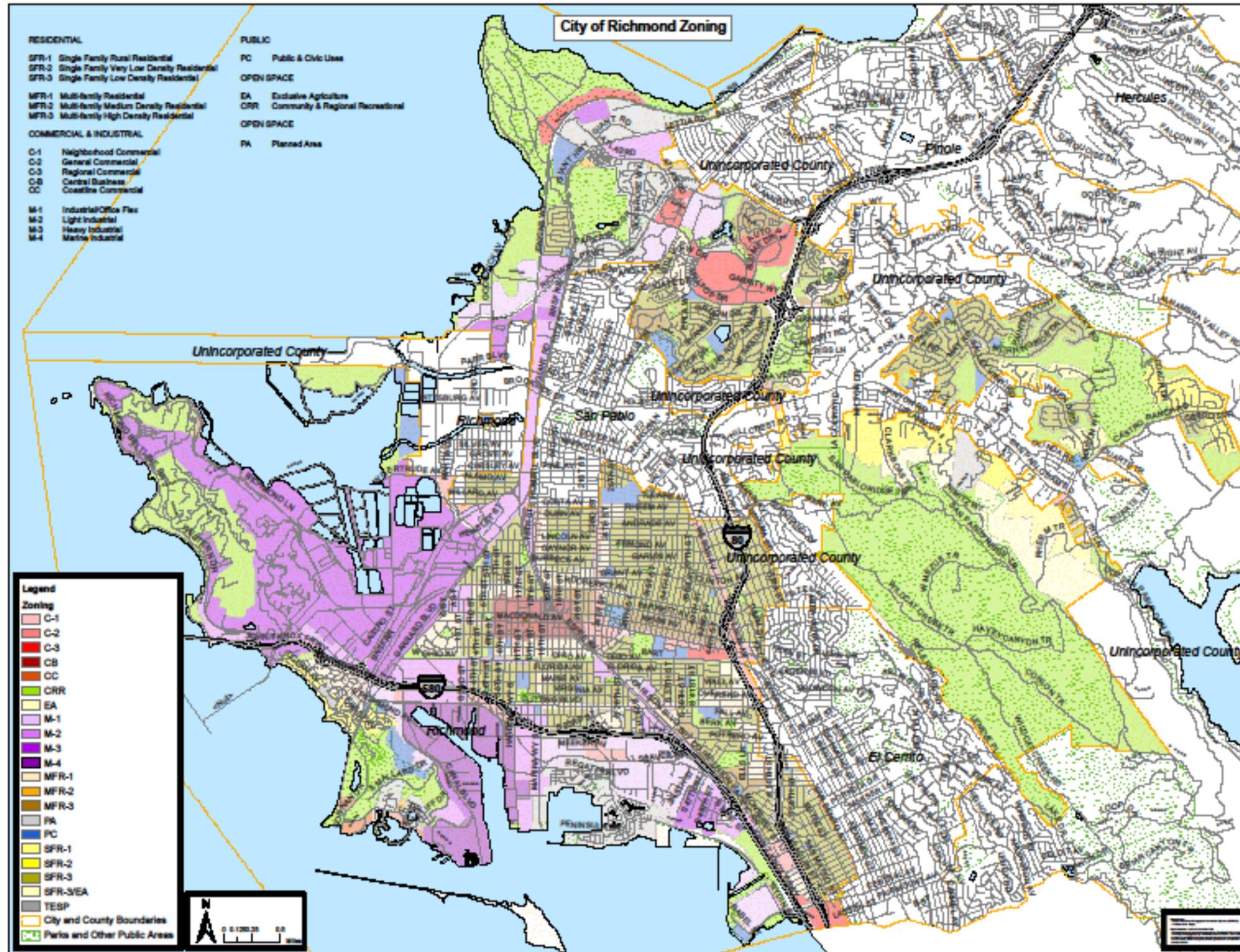


BOX	NAME	DESCRIPTION	QUANTITY AVAILABLE
A	#RD4 EYEWASH / SAFETY SHOWER	SELF CONTAINED BREATHING APPARATUS	1
	#SC41 WATER / FOAM UNIT	FIXED STATION EYEWASH / SHOWER	1
	#SC36 DRY CHEM FIRE EXTINGUISHER	WATER / FOAM UNIT	1
	FORE HOSE / WATER OUTLET	DRY CHEM FIRE EXTINGUISHER	1
B	CFDMS044	FIXED STATION FIRE / WATER HOSE	1
C	#SC40	GRANULIZED ABSORBENT	1 PALLET
	FORE HOSE / WATER OUTLET	DRY CHEM FIRE EXTINGUISHER	1
D	CFDMS039	WATER / FOAM UNIT	1
E	#RD3	FIXED STATION FIRE / WATER HOSE	1
	CFDMS043	DRY CHEMICAL FIRE EXTINGUISHER	1
F	#RD2 EYEWASH / SAFETY SHOWER	SELF CONTAINED BREATHING APPARATUS	1
	#SC38 WATER / FOAM UNIT	FIXED STATION EYEWASH / SHOWER	1
	#SC35 DRY CHEM FIRE EXTINGUISHER	WATER / FOAM UNIT	1
	FORE HOSE / WATER OUTLET	DRY CHEM FIRE EXTINGUISHER	1
G	FORE HOSE / WATER OUTLET	FIXED STATION FIRE / WATER HOSE	1
	EYEWASH / SAFETY SHOWER	FIXED STATION EYEWASH / SHOWER	1
H	CFDMS037	DRY CHEM FIRE EXTINGUISHER	1
	CIRCUIT BREAKER	N/A	1
I	PROTECTIVE SUITS	FULL BODY COATED, IMPERMEABLE, FULL BODY WITH HOODS	1 CASE+
J	CFDMS046	DRY CHEM FIRE EXTINGUISHER	1
	CFDMS034	DRY CHEM FIRE EXTINGUISHER ON WHEELS (UNPRESSURIZED)	1
	CFDMS033	CO2 FIRE EXTINGUISHER	1
	FORE-AID KIT	INDUSTRIAL UNIT	1
K	SPILL RESPONSE / CONTROL	SPILL CONTROL ADSORBENT PILLIOWS	200
		SPILL CONTROL ADSORBENT BOOMS	40
		SPILL CONTROL ADSORBENT SHEETS	200
		DAH KIT TEMP RBL 30ME	4
		HAZARDOUS MATERIAL BAGS	200
		POLYPROPYLENE SHOVEL	1
		POLY HAND PUMP	2
	PROTECTIVE BOOTS	PVC MID CALF	6 PR+
		PVC OVERBOOTS	6 PR+
	PROTECTIVE GLOVES	PVC KNIT LINER	1 CASE+
	EYE PROTECTION	POLYCARBONATE HMD-GOGGLES	1 CASE+
	RESPIRATORS	FULL FACE	6 PCS+
		HALF FACE	6 PCS+
		ORGANIC VAPOR CARTRIDGES	1 CASE+
		MFO CARTRIDGES	1 CASE+
	HARD HATS	ANSI DSHA APPROVED	6 HATS+
L	CFDMS030	DRY CHEMICAL FIRE EXTINGUISHER	1
	CIRCUIT BREAKER	N/A	1
M	RD3	SELF CONTAINED BREATHING APPARATUS	1

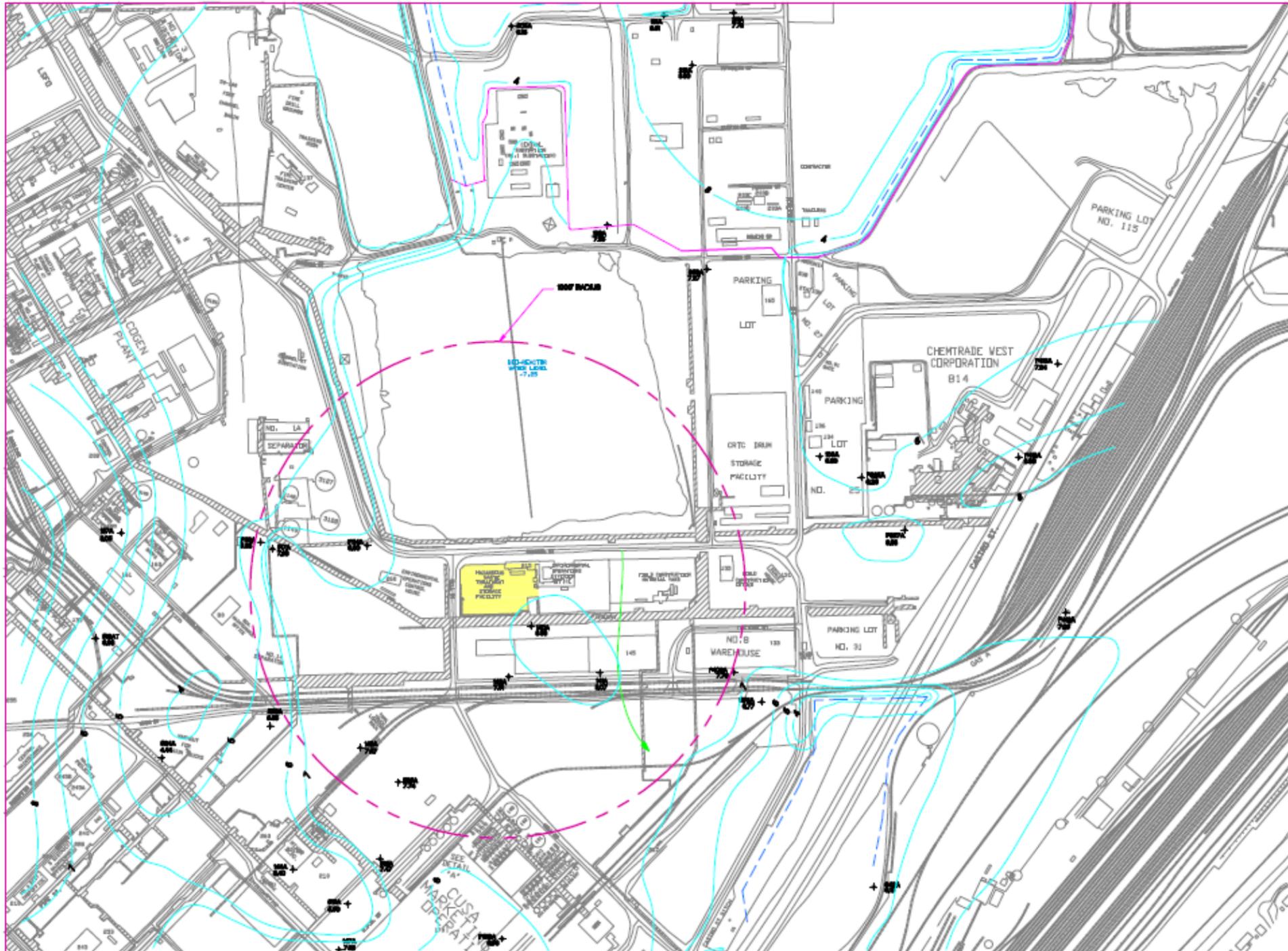
MAP #3

THIS IS AN AUTOCAD DRAWING. DO NOT REVISE MANUALLY.

REFERENCE DRAWINGS	REVISIONS	<p>Chevron Ridway Refinery</p>	PLOT PLAN COMMUNICATIONS, SECURITY, SAFETY EQUIP & SERVICES HAZARDOUS WASTE TREATMENT AND STORAGE FACILITY UTILITIES AND ENVIRONMENTAL AREA BUSINESS UNIT
	② REVISED PER MARK-UP. 01-21-15 ③ REVISE PER MARKUP AND FIELD VERIFY 09-22-04	SCALE: 1" = 20' DWG: AVEN DWR: JEN DPG: JEN	APPROVED: A V.D.: S.D.: D-342942-2



MAP #6



- EXPLANATION**
- + 100' Groundwater Well or Piezometer with Groundwater Elevation Measured in Feet Above National Railway Datum (NRC)
 - 4' Line of Equal Groundwater Table Elevation in Feet, Above National Railway Datum (NRC)
 - GPS Barrier Wall
 - GPS Extension Trench
 - Flow Direction
 - Hazardous Waste Treatment + Storage Facility

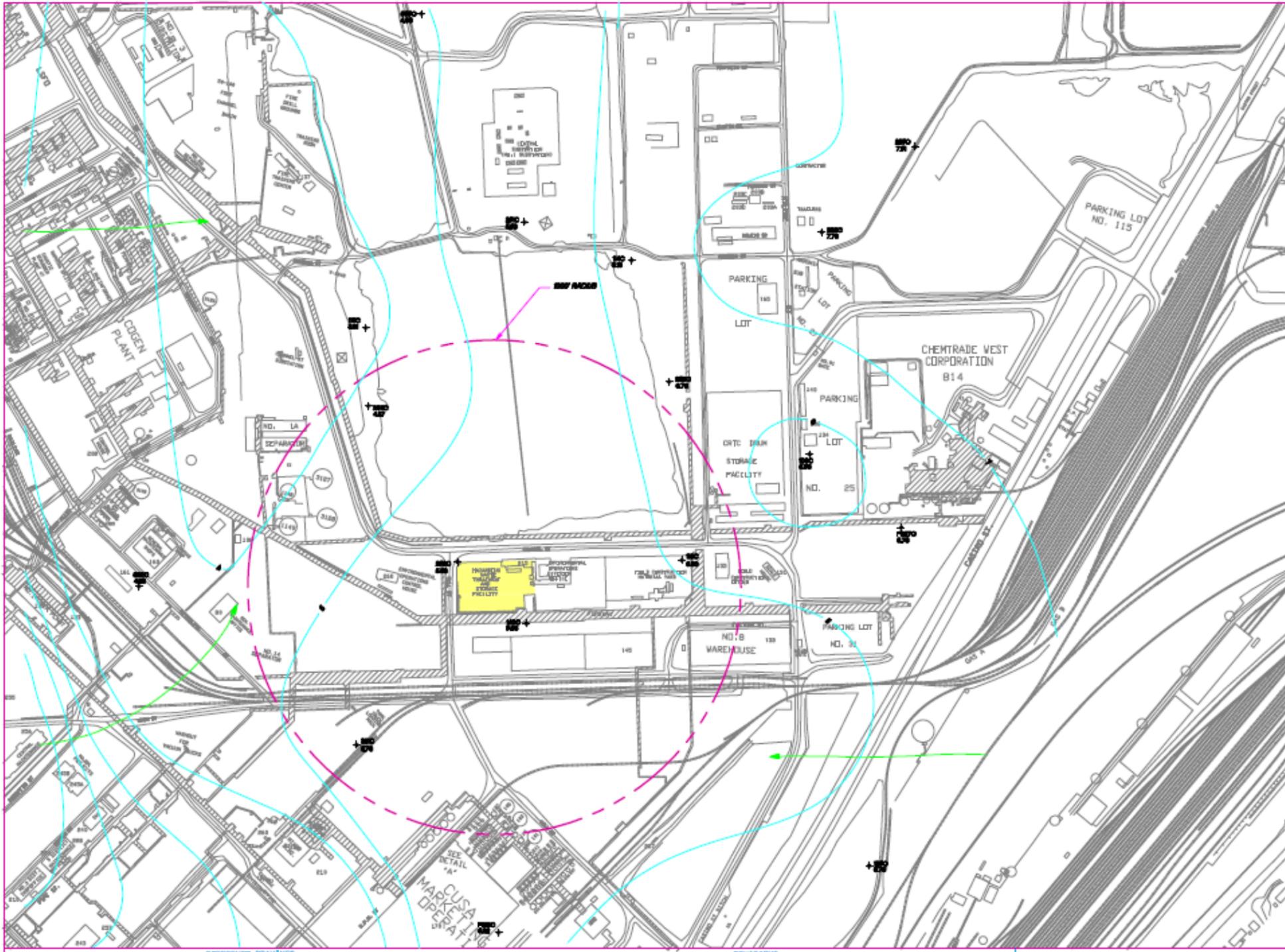
- NOTES**
1. Contours shown are approximate and should be used to provide flow rates only in a general sense. Due to the heterogeneity of the "V" zone soil and the impacts on natural groundwater flow, the direction of ground water flow at a specific location should only be interpreted in a general manner.
 2. Contours are shown as solid lines for clarity and are not meant to imply accuracy.
 3. Elevation levels measured during the months of February and March 2016.
 4. Contour intervals are variable. Water levels measured in feet. Line of equal groundwater elevation shown in feet, above National Railway Datum (NRC).
 5. National Railway Datum (NRC) is equivalent to -2.2 feet, Mean Sea Level.
 6. Wells with low-pipe hydrocarbon are surrounded to the extent of potential surface.
 7. Contours may end in areas of steep gradients for reasons of drawing clarity.



MAP #7

THIS IS AN AUTOCAD DRAWING. DO NOT REVISE MANUALLY.

REFERENCE DRAWINGS		REVISES		 CHEVRON Railroad Railway		MAP #7 "A" ZONE WATER TABLE HAZARDOUS WASTE TREATMENT AND STORAGE FACILITY UTILITIES AND ENVIRONMENTAL AREA BUSINESS UNIT	
				REVISIONS 1 REVISED PER MARK-UP.	DATE: 04-07-16 DRAWN BY: AVEN CHECKED BY: [blank]	SCALE: 1"=200'-0" OR N.T.S. DATE: 04-07-16	PROJECT NO: D-342945-1 SHEET NO: A



- EXPLANATION**
- ± 0.00 Groundwater Table or Piezometer with Piezometer to Surface Elevations Measured in Post-Storm Remedial Action System (PRAS)
 - ± 0.25 Piezometer to Surface Elevations in Post-Storm Remedial Action System (PRAS)
 - Flow Direction
 - Hazardous Waste Treatment + Storage Facility

- NOTES**
1. Contours shown are approximate and should be used to provide the owner with a general sense. Due to the heterogeneity of the "V" zone soil and the dynamic nature of groundwater flow, the location of groundwater level at a specific location should not be interpreted as a general sense.
 2. Contours are shown as solid lines for clarity and are not meant to imply accuracy.
 3. Water levels measured during the months of February and March 2005.
 4. Contour Interval = 1 foot.
 5. Groundwater Elevations (GEL) is indicated by -52 feet Mean Sea Level.



MAP #8

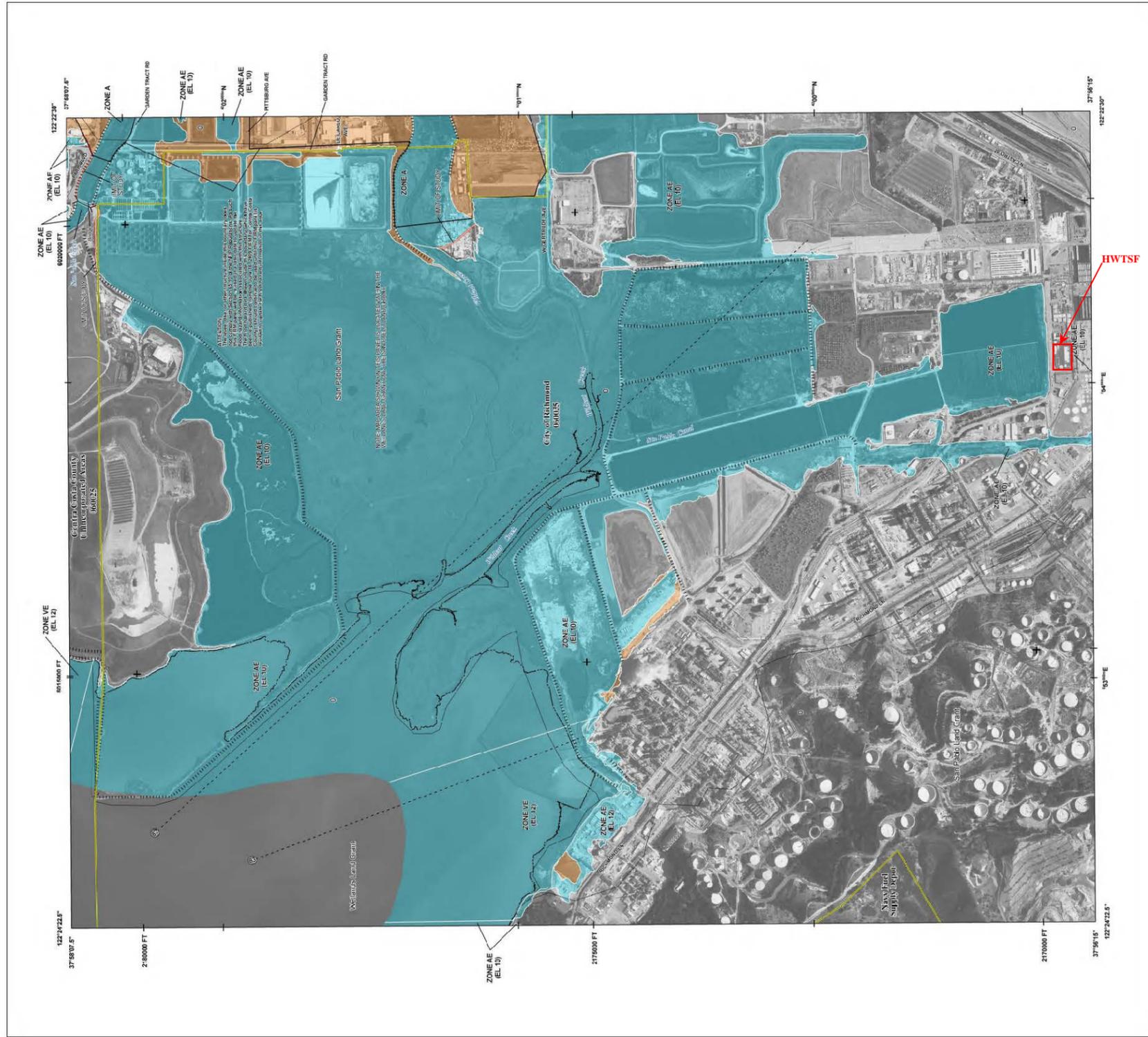
THIS IS AN AUTOCAD DRAWING. DO NOT REVISE MANUALLY.

REFERENCE DRAWINGS		REVISIONS		DATE	BY	CHKD.	APP.
		1	REVISED PER MARK-UP.	05-07-16	TPM		

Chevron
 Richmond Refinery

SCALE: 1"=200'-0" IN. M.THE. IN. APP. J.R.K.L. DATE: 8-26-01 APPROVED:
 CHKD. AVEN CHKD. DEPT.
 DRG'G. DEPT.

MAP	HAZARDOUS WASTE TREATMENT AND STORAGE FACILITY UTILITIES AND ENVIRONMENTAL AREA BUSINESS UNIT	
V.O.	D-342946-1	
S.O.		



FLOOD HAZARD INFORMATION

SEEKS INFORMATION FOR FLOOD HAZARD INFORMATION FOR THE PANEL LOCATOR

THE INFORMATION IS AVAILABLE IN DIGITAL FORMAT AT
[HTTP://ANS.C.FEMA.GOV](http://ansc.fema.gov)

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) Zone X, VE, A1, A2, A3, VE, A1, VE, A1
- With BFE or Depth Zone AE, A1, VE, A1
- Regulatory Highway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard Areas of 1% annual chance flood with average depth less than one foot or with drainage area of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with increased flood risk due to levee breach Zone X
- MScreen
- Area of Minimal Flood Hazard Zone X
- Area of Undetermined Flood Hazard Zone D
- Channel, Culvert or Storm Sewer
- Accredited or Provisionally Accredited Levee, Dike or Floodwall
- Non-accredited Levee, Dike or Floodwall

GENERAL STRUCTURES

- 18.2 Cross Sections with 1% Annual Chance Water Surface Elevation (WSE)
- 17.6 Coastal Traverset
- Profile Baseline
- Hydrographic Feature
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For additional information about the map, available products associated with the FEMA Flood Insurance Rate Map (FIRM) data, or to learn more about the National Flood Insurance Program (NFIP), please visit the FEMA website at www.fema.gov. For more information about the map, please visit the FEMA website at www.fema.gov. For more information about the map, please visit the FEMA website at www.fema.gov. For more information about the map, please visit the FEMA website at www.fema.gov.

SCALE

1:1 inch = 500 feet

0 250 500 750 1,000 2,000 5,000 Feet

0 125 250 500 1,000 Meters

PANEL LOCATOR

0226	0227	0228
0226	0227	0228
0226	0227	0228

*PANEL NOT PRINTED



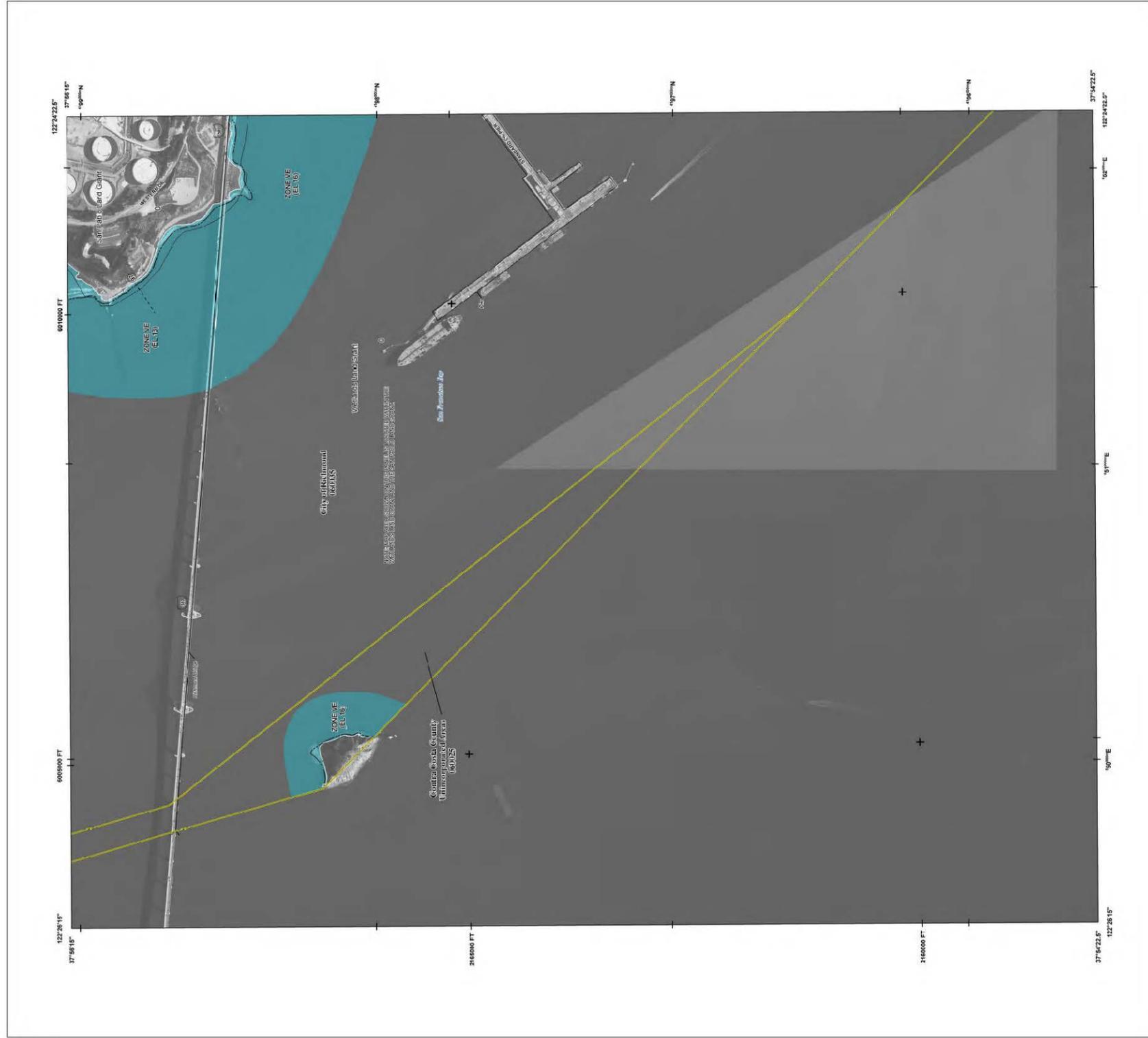
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

CONTRA COSTA COUNTY, CALIFORNIA
PANEL 209 of 602

Panel Contains:
 COMMUNITY RICHMOND, CITY OF
 NUMBER 209
 PANEL SUFFIX 0000
 MAP NUMBER 060335
 MAP REVISION 0000

VERSION NUMBER 2.3.2.0
 MAP NUMBER 060335
 MAP REVISION 0000
 SEPTEMBER 30, 2015

Map #9a



FLOOD HAZARD INFORMATION

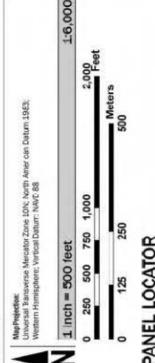
SEE THE REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT. THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT [HTTP://7083C.FEMA.GOV](http://7083C.FEMA.GOV)

- SPECIAL FLOOD HAZARD AREAS**
 - Without Base Flood Elevation (BFE) Zone A, V, A99
 - With BFE or Depth Zone AE, AO, AH, VE, AR
 - Regulatory Floodway
 - 0.2% Annual Chance Flood Hazard, Areas of 1% Annual Chance Flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
 - Future Conditions 1% Annual Chance Flood Hazard Zone X
 - Area with Heavily Hooded Risk due to Levee Failures Zone X
- OTHER AREAS OF FLOOD HAZARD**
 - MS (GREEN) Areas of Minimal Flood Hazard Zone X
 - Area of Undetermined Flood Hazard Zone D
 - Channel, Culvert or Storm Sewer
 - Accredited or Provisionally Accredited Levee, Dike or Floodwall
 - Non-accredited Levee, Dike or Floodwall
 - 18.2 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
 - 17.5 Water Surface Elevation (BFE)
 - Coastal Tract
 - Coastal Tract Baseline
 - Profile Baseline
 - Hydrographic Feature
 - Base Flood Elevation Line (BFE)
 - Limit of Study
 - Jurisdiction Boundary
- OTHER FEATURES**

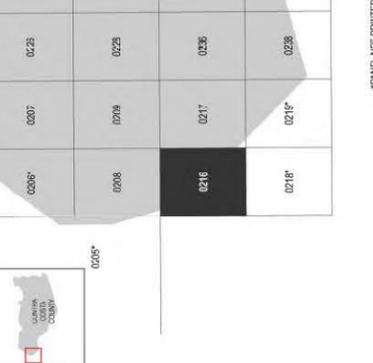
NOTES TO USERS

For information and assistance about this map, or related products associated with the FEMA Flood Insurance Rate Map (FIRM) Map Service Center, please contact the FEMA Map Information Exchange at 1-877-FEMA-MAP (1-877-362-6271) or visit the FEMA Map Service Center website at www.fema.gov. For more information on the map, please contact the FEMA Map Service Center website at www.fema.gov. This map is a product of the FEMA Map Service Center website and is not intended to be used for any other purpose. The map is not intended to be used for any other purpose. The map is not intended to be used for any other purpose.

SCALE



PANEL LOCATOR



**NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP**

FEMA

**CONTRA COSTA COUNTY,
CALIFORNIA**
and Incorporated Areas

Panel: 216 of 602

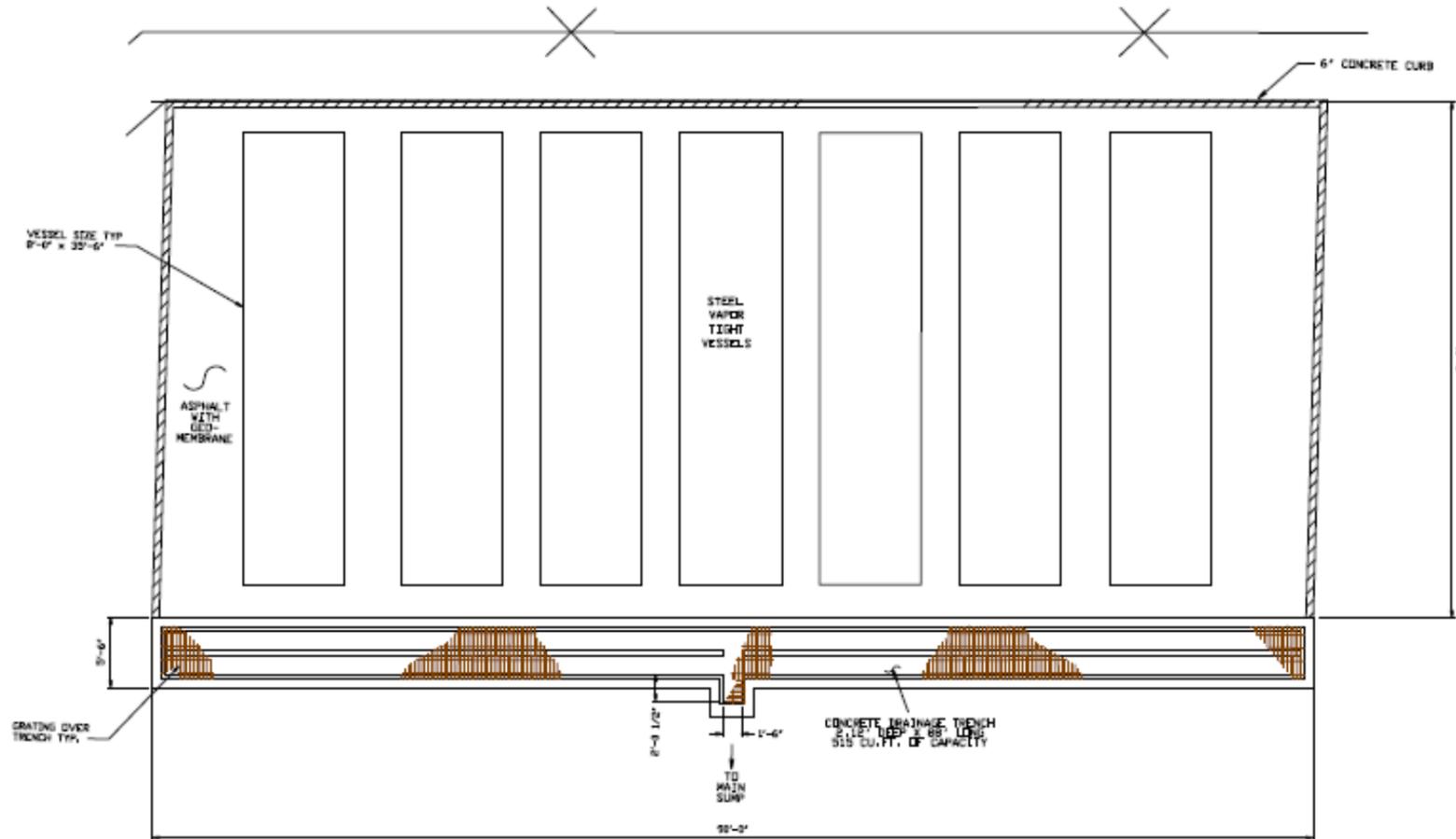
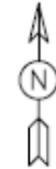
Project: Community
COMMUNITY: CONTRA COSTA COUNTY
FIRM: 1511 DP

NUMBER: 060025
SUFFIX: 0216

VERSION NUMBER: 2.3.2.0
MAP NUMBER: 06013002166
MAP REVISION: SEPTEMBER 30, 2015

Map #9c

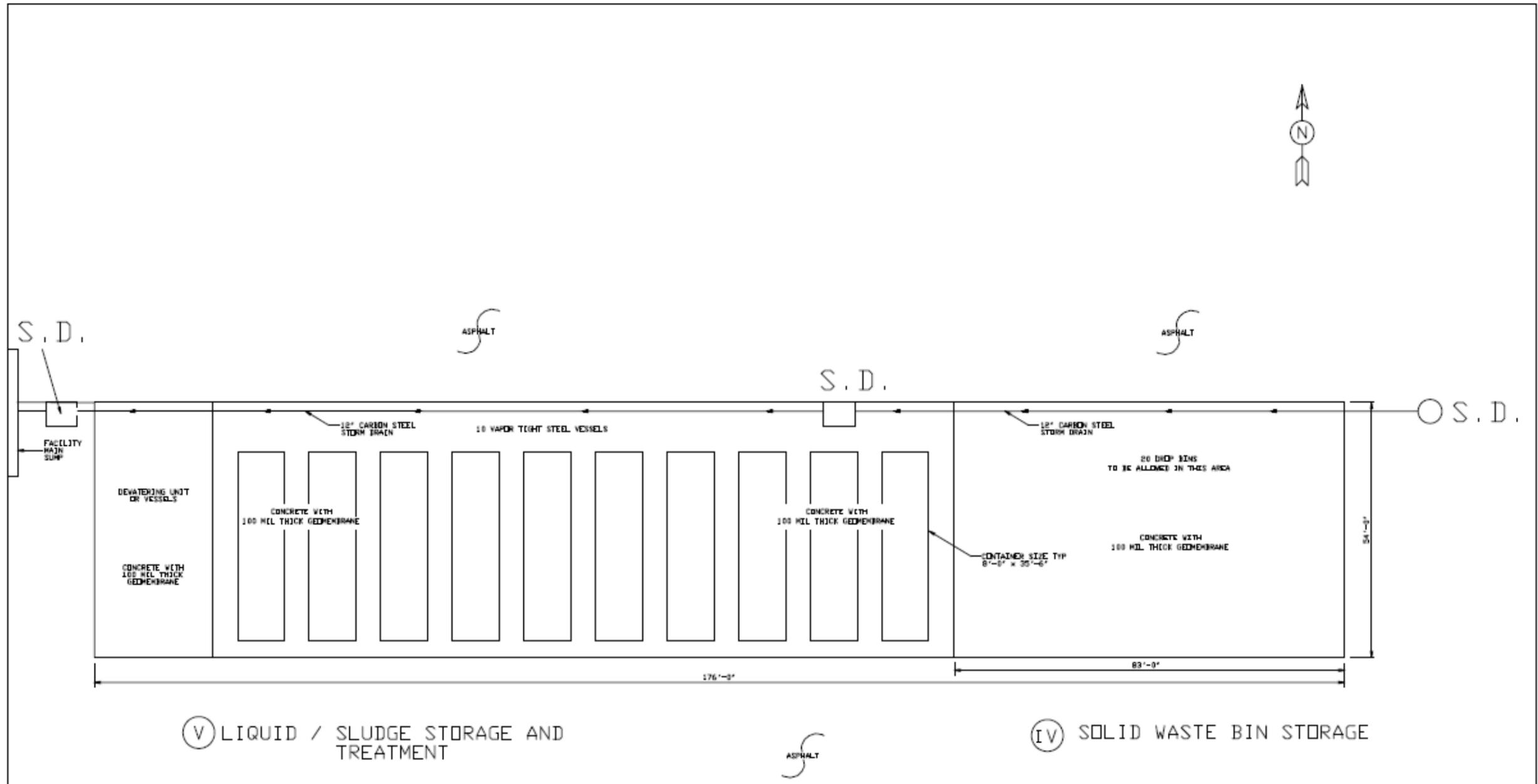
III BULK LIQUID STORAGE AND TREATMENT AREA



MAP #11

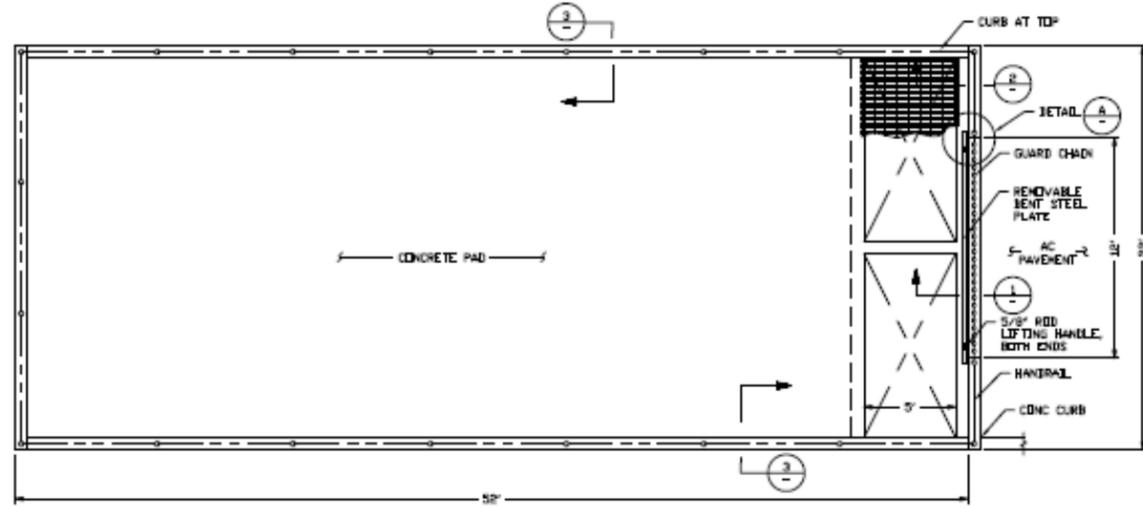
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REFERENCE DRAWINGS		REVISIONS		Chevron Richmond Refinery		APPROVED	
		◇	UPDATED FOR HWTS 2001 PERMIT.	DATE	BY	DATE	BY
				08-14-01	JRC		
		◇	REVISE PER MARKUP AND FIELD VERIFY	DATE	BY	DATE	BY
				09-02-04		02-17-16	PMH
		◇	REVISED PER MARK-UP.	DATE	BY	DATE	BY
						APPROVED	
						RJC	
						M.D.	
						S.D.	D-308002-3

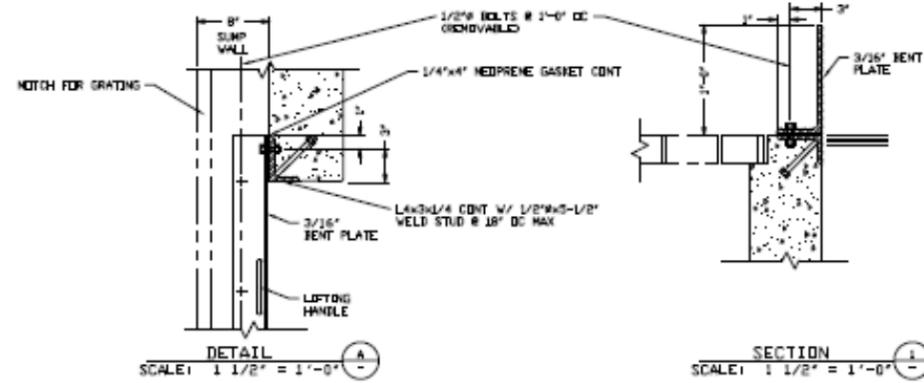


REFERENCE DRAWINGS		REVISIONS		Chevron Richmond Refinery		APPROVED		THIS IS AN AUTOCAD DRAWING. DO NOT REVISE MANUALLY.	
		◇	UPDATED FOR HWTS 2001 PERMIT.	DATE	BY	DATE	BY	DATE	BY
		◇	REVISE PER MARKUP AND FIELD VERIFY	09-02-04	JMK	02-17-15	RYM	04/07/2016	RJC
						APPROVED		PLAT PLAN	
						V.D. _____		LIQUID/SLUDGE STORAGE & TREATMENT, SOLID WASTE BIN STORAGE	
						S.D. _____		HAZARDOUS WASTE TREATMENT AND STORAGE FACILITY	
								UTILITIES AND ENVIRONMENTAL AREA BUSINESS UNIT	
								D-308003-3	

Area II – Detailed Map

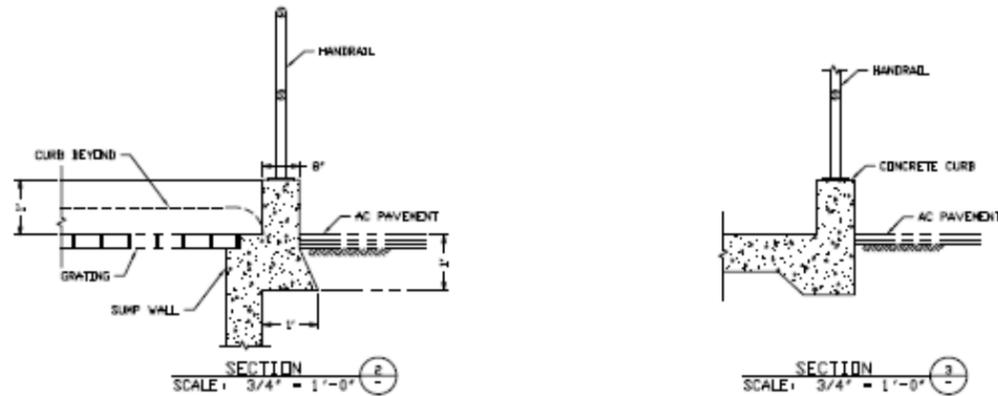


PLAN
SCALE: 1/4" = 1'-0"



DETAIL A
SCALE: 1 1/2" = 1'-0"

SECTION 1
SCALE: 1 1/2" = 1'-0"



SECTION 2
SCALE: 3/4" = 1'-0"

SECTION 3
SCALE: 3/4" = 1'-0"

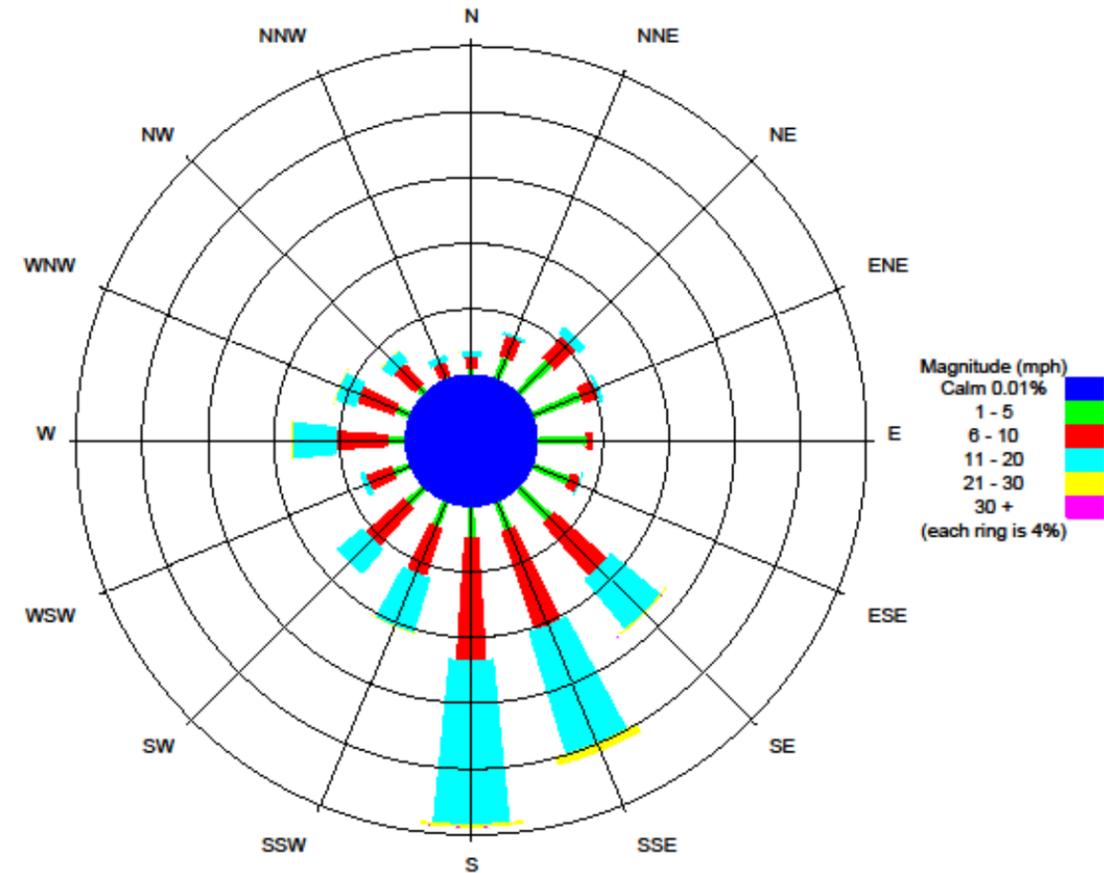
MAP #13

THIS IS AN AUTOCAD DRAWING. DO NOT REVISE MANUALLY.

REFERENCE DRAWINGS			REVISIONS			Chevron Richmond Refinery		DETAILS	
								SECONDARY CONTAINMENT	
								HAZARDOUS WASTE TREATMENT AND STORAGE FACILITY	
								UTILITIES AND ENVIRONMENTAL AREA BUSINESS UNIT	
								M	D-342985-1

Western Weather Group, Inc.
Chico, CA
Cumulative Wind Speed Summary For Chevron (Yearly)
Beginning - 1/01/2010 01:00 Ending - 12/31/2012 24:00 (Continuous)

	1 - 5	6 - 10	11 - 20	21 - 30	30 +	Total
N	0.30	0.76	0.30	0.03	0.00	1.40
NNE	1.34	1.32	0.19	0.00	0.00	2.85
NE	2.53	1.77	0.60	0.00	0.00	4.90
ENE	3.06	1.01	0.25	0.00	0.00	4.32
E	2.90	0.41	0.02	0.00	0.00	3.33
ESE	2.27	0.64	0.13	0.00	0.00	3.03
SE	2.53	4.26	3.90	0.14	0.00	10.83
SSE	1.75	6.32	7.75	0.60	0.00	16.42
S	1.83	7.46	9.98	0.21	0.00	19.48
SSW	1.53	3.11	3.47	0.07	0.00	8.19
SW	1.31	3.09	2.03	0.00	0.00	6.44
WSW	1.01	1.64	0.35	0.00	0.00	3.00
W	1.01	3.11	2.69	0.07	0.00	6.89
WNW	0.84	2.38	1.30	0.06	0.00	4.58
NW	0.41	1.68	0.82	0.04	0.00	2.95
NNW	0.07	0.89	0.40	0.01	0.00	1.37
Total	24.69	39.85	34.20	1.24	0.01	99.99 % Winds 0.01 % Calm 100.00 % Total



MAP #14

XV. Geology of the Site

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- A. Site Location and Historical Data
- B. Hydrogeologic Setting
- C. Seismic Information

Figure XV-1 Active Faults in the San Francisco Bay Region

XV. Geology of the Site

A. Site Location and Historical Data

The following information excerpted is excerpted from the document titled *Geological Hazards Study, Hazardous Waste Treatment and Storage Facility, Chevron Richmond Refinery* Prepared in November 2004 and signed by a Ph.D., P.E.

The current HWTSF was constructed in 1984 to treat and store hazardous waste at the refinery. URS Corporation (formerly Dames and Moore) conducted a geotechnical investigation for the original HWTSF in 1984 (Dames and Moore, 1984). In addition, URS has developed an extensive body of subsurface data at the refinery over the past several decades. URS reviewed the available geotechnical information and reports at and near the existing Hazardous Waste Treatment and Storage Facility. The reviewed information and data included soil boring logs, subsurface soil profiles, and the results of filed and laboratory tests. The geologic information required for new facilities or facilities undergoing modification is not required for the HWTS Facility, which is an existing HWTSF.

B. Hydrogeologic Setting

The Richmond Refinery and its appurtenant tank fields are located on the peninsula of the Potrero-San Pablo Ridge, which is composed of steeply dipping Franciscan Complex. The refining of the petroleum products generally occurs on the bay fill areas northeast of the ridge.

Past fluctuations in sea level created a complex sedimentary sequence of interfingering estuarine and alluvial fan deposits overlying the Franciscan Complex bedrock. The uppermost deposits are artificially placed bay fill, ranging from ~3 feet to ~30 feet in depth. The fill materials overlie bay muds which consist of silt and silty clay with abundant plant matter or peat. The bay muds overlap onto the Franciscan bedrock and thicken bayward.

Three hydrogeologic zones have been identified within the top 150 feet of sediments in the flat lying areas of the site, the A-Zone, C-Zone, and the B-Zone, in order of increasing depth. Maps 7 and 8 show the water contour lines for the A-Zone and C-Zone respectively.

The A-Zone is the first water bearing zone and consists of artificial fill and the naturally occurring peat-rich bay mud. The water table elevation for this zone is within 2 to 10 feet of the ground surface and generally discharges to the Bay.

The C-Zone is an 80 to 90-foot thick water bearing zone of interfingering alluvial and estuarine sediments. These sediments generally have low hydraulic conductivity, but sandy, more permeable units occur as channels and lenses. The sand units have not been shown to be contiguous across the site, but do appear to be hydraulically connected. However, based on 13 years of chemical data, there is no indication that the C-Zone groundwater has been significantly impacted. Chevron has concluded that the bay mud has been an effective hydraulic barrier between the A- and C-Zone. These results and conclusions were presented to the RWQCB in 1991 and continue to be supported by groundwater monitoring data collected pursuant to the Refinery-wide Self-Monitoring Program.

The B-Zone is a relatively permeable unit at ~100 feet below the ground surface. It ranges from 5 to 15 feet thick and contains potable water, but has limited production capacity. The B-Zone occurs under artesian conditions and appears to be hydraulically separate from the overlying zones.

The average depth to groundwater at the HWTSF is ~2 to 5 feet below the ground surface. Groundwater elevation data is collected from nearby Monitoring Wells 140A, 141A, and 142A, shown on Map #4.

C. Seismic Information

An extensive body of subsurface data has been developed at the Refinery over the past several decades. Information and data include soil boring logs, subsurface soil profiles, and field and laboratory soil tests.

1. HWTSF Design and Operations To Minimize Any Unplanned Release In The Event Of An Earthquake

The HWTSF is an existing and operating HWTSF and all structures are single story only. The maximum allowable capacities are not increased by this permit renewal. The HWTSF's contingency plan and post earthquake inspections are designed to minimize impact from any seismic activity. The HWTSF is completely paved with run-off and run-on protection. The Refinery has its own Fire Department and Emergency Medical Technicians to respond to emergencies within the Refinery.

The HWTSF's secondary containment is designed to hold 10% of the total maximum volume allowed to be stored in the HWTSF at any time. Each area of the HWTSF handles a specific waste type or group of wastes, such that all wastes within a given area are compatible with each other. Each area is designed to contain any spills or storm water such that they do not contact waste in other areas.

2. The following information is excerpted from the document titled *Geological Hazards Study, Hazardous Waste Treatment and Storage Facility, Chevron Richmond Refinery* Prepared in November 2004 and signed by a Ph.D., P.E.

Section 4.2 Surface Conditions

The site ground surface is at approximately elevation +11.5 feet along the perimeter of the site and approximately +10.5 feet near the center of the site. The surface grading was designed to direct surface flow from the perimeter of the HWTSF to the storm drain at the center of the HWTSF. The storm drains lead directly to a sump basin on site.

Section 4.3 Subsurface Conditions

A geotechnical investigation for the original HWTSF in 1984 included 5 borings to explore the subsurface conditions. The subsurface soils consists of three fill layers underlain by naturally-deposited estuarine and alluvial deposits.

The surficial asphalt and concrete pavement is underlain by a 1.5 to 2.5 feet thick fill layer consisting of high strength granular materials (e.g., sand with variable amounts of gravel silt). This engineered fill was place in relatively thin lifts (e.g., 6 to 8 inches thick) and compacted to at least 95% relative density.

Beneath the structural fill a 2- to 3.5 foot thick layer of loose to dense clayey to silty gravel with variable amounts of sand.

This is underlain by 3 to 5.5 feet of hydraulic fill consisting of a heterogeneous mixture of soft fat clay and loose fine silty sand. The strength and permeability of the hydraulic fill varies widely because of the differences between the more clayey and more sandy layers.

Below the hydraulic fill, there is 5.5 to 8.5 feet of soft, compressible fat clay known as Recent Bay Mud. This is underlain by an alluvial deposit consisting of medium stiff to stiff clay with variable amounts of fine sand with occasional lenses of dense sand with variable amounts of gravel.

Section 5.8 Liquefaction

The only potential liquefiable soil at the site may be discontinuous isolated pockets or lenses of loose fine silty sand within the hydraulic fill layer, which is located between about elevation +2 and +7 feet. The hydraulic fill consists of a heterogeneous mixture of soft clay and fine silty sand, and it is covered by 2 to 3.5 feet of clayey or silty gravel fill, which, in turn, is overlain by 1.5 to 2.5 feet of engineered granular fill and pavement. The hydraulic fill is underlain by Recent Bay Mud. Because of the heterogeneous nature of the hydraulic fill, any potential liquefaction will be restricted to isolated pockets or lenses of fine silty sand.

Geologic hazards associated with wide-spread soil liquefaction include: ground rupture, sand boils and sudden loss of bearing support, ground subsidence due to densification of the liquefied sand layer, and lateral spreading. These phenomena are discussed in the following sections.

Section 5.9 Ground Rupture, Sand Boils, and Loss of Bearing Support

If soil liquefaction occurs in the fine silty sand pockets/lenses within the hydraulic fill layer, it is possible that sand will flow upward through cracks in the surficial fill layers, resulting in sand boils and subsidence at the ground surface. This could lead to loss of bearing support for the asphalt and concrete pavement which in turn could cause the pavement to crack.

Because the fine silty sand pockets are overlain by 3.5 to 6 feet of fill material, they are vertically constrained, and therefore the potential for ground rupture, sand boils, and loss of bearing support is low.

Section 5.10 Sand Densification

Liquefaction of the isolated fine silty sand pockets/lenses within the hydraulic fill layer can lead to contraction, or densification of the fine silty sand. Densification of these sand pockets may lead to settlement of the overlying fill layers, which could cause the ground surface pavement to crack. The fine silty sand pockets/lenses may be on the order of a few feet in diameter, but they are isolated within the soft clay of the hydraulic fill. Therefore, if sand densification were to occur, the amount of resulting settlement likely will be small.

Section 5.11 Lateral Spreading

Any potential liquefaction at the site will be restricted to isolated fine silty sand pockets within the hydraulic fill layer. Because these pockets are not contiguous, and because the Bio-reactor basin is far to the north of the site, there is no potential for lateral spreading.

3. **The following discussion on active faults in the Bay Area is excerpted from the document titled *Geological Hazards Study, Hazardous Waste Treatment and Storage Facility, Chevron Richmond Refinery* Prepared in November 2004 and signed by a Ph.D., P.E.**

The Refinery is located within the Coast Ranges tectonic province, an area characterized by a moderate to high level of seismicity. The Coast Ranges are principally composed of the Franciscan Complex, which was assembled and dismembered by the subduction of oceanic plate(s) beneath the western margin of North America from Late Jurassic to Early Tertiary times.

The Coast Ranges tectonic province is bounded on the west by the northwest-trending San Andreas Fault System, the primary boundary between the Pacific and North American plates. In the San Francisco Bay region, the plate boundary is a 100-km-wide zone of deformation consisting of several major strike-slip fault zones including the San Gregorio, San Andreas, Hayward-Rogers Creek, Calaveras, Concord-Green Valley, and Greenville faults.

Fault Creep (Aseismic Slip)

Some faults or sections of faults move in a continuous aseismic manner, meaning that they slip without generating earthquakes. Fault creep has been documented on the Hayward, Calaveras, San Andreas, and Concord faults in the San Francisco Bay region. There is considerable uncertainty regarding the relative importance of aseismic slip on the Hayward fault, and on the other faults characterized by the Working Group of California Earthquake Probabilities, (WGCEP, 1999).

The following sections provide details of the fault characteristics of the major faults in the Bay Area. It should be noted that maximum earthquake magnitudes quoted in these sections assume complete rupture of the relevant fault segment(s).

San Andreas Fault Zone

The dominant active fault structure in this region is the San Andreas fault. The fault extends a total distance of 1,200 km from the Gulf of California, Mexico, to Point Delgada on the Mendocino Coast in northern California. The San Andreas fault accommodates the majority of the motion between the Pacific and North American plates. This fault is the largest active fault in California, and is responsible for the largest known earthquake in Northern California, the 1906 magnitude 7.9 San Francisco earthquake (Wallace 1990).

The San Andreas fault is divided into a number of fault segments. Each of these segments is capable of rupturing either independently or in conjunction with adjacent segments.

Hayward Fault

The Hayward fault extends for 100 km from the areas of Mount Misery, east of San Jose, to Point Pinole on San Pablo Bay. At Point Pinole, the Hayward fault runs into San Pablo Bay. The northern continuation of this fault system is the Rogers Creek fault. Systematic right-lateral geomorphic offsets and creep offset of cultural features have been well documented along the entire length of the fault (Lienkaemper, 1992).

The Hayward fault is considered the most likely source of the next major earthquake in the Bay Area (WGCEP, 1999). As well as undergoing displacement earthquake ruptures, the Hayward fault also moves by aseismic creep. Measurements along the fault over the last 2 decades show that the creep rate is 3 to 10 mm/year *(Lienkaemper and Galehouse, 1997

Rogers Creek Fault

As indicated previously, the Hayward fault runs into San Pablo Bay at Point Pinole. The northern continuation of this fault system is the Rodgers Creek Fault. The Rodgers Creek fault is 44 km long and has a similar geomorphic expression to the Hayward fault. Microseismicity is nearly absent along much of the length of the fault suggesting that it is a seismic gap and site of an impending earthquake (Wong, 1991).

Calaveras Fault

This fault is a main component of the San Andreas system, branching off the main San Andreas fault south of Hollister, and extending northwards for approximately 120 km to the areas of Danville.

Concord-Green Valley Fault

The Concord fault, and its continuation on the northern side of Suisun Bay is the Green Valley fault. The fault extends for 18 km along the eastern margin of Ygnacio Valley, from the northern slopes of Mount Diablo to Suisun Bay.

Cordelia Fault

The Cordelia fault extends from south of Cordelia to the western shore of Lake Curry as a series of discontinuous north and north-north-west striking fault strands.

Greenville Fault

This fault is part of the San Andreas system in the northern Diablo Range. The fault extends from Bear Valley to just north of Livermore Valley.

West Napa Fault

The fault comprises a series of fault strands along the western side of the Napa Valley extending south of Napa to Yountville, a distance of approximately 25 km. Very little contemporary seismicity is associated with this fault (Wong, 1990).

San Gregorio Fault Zone

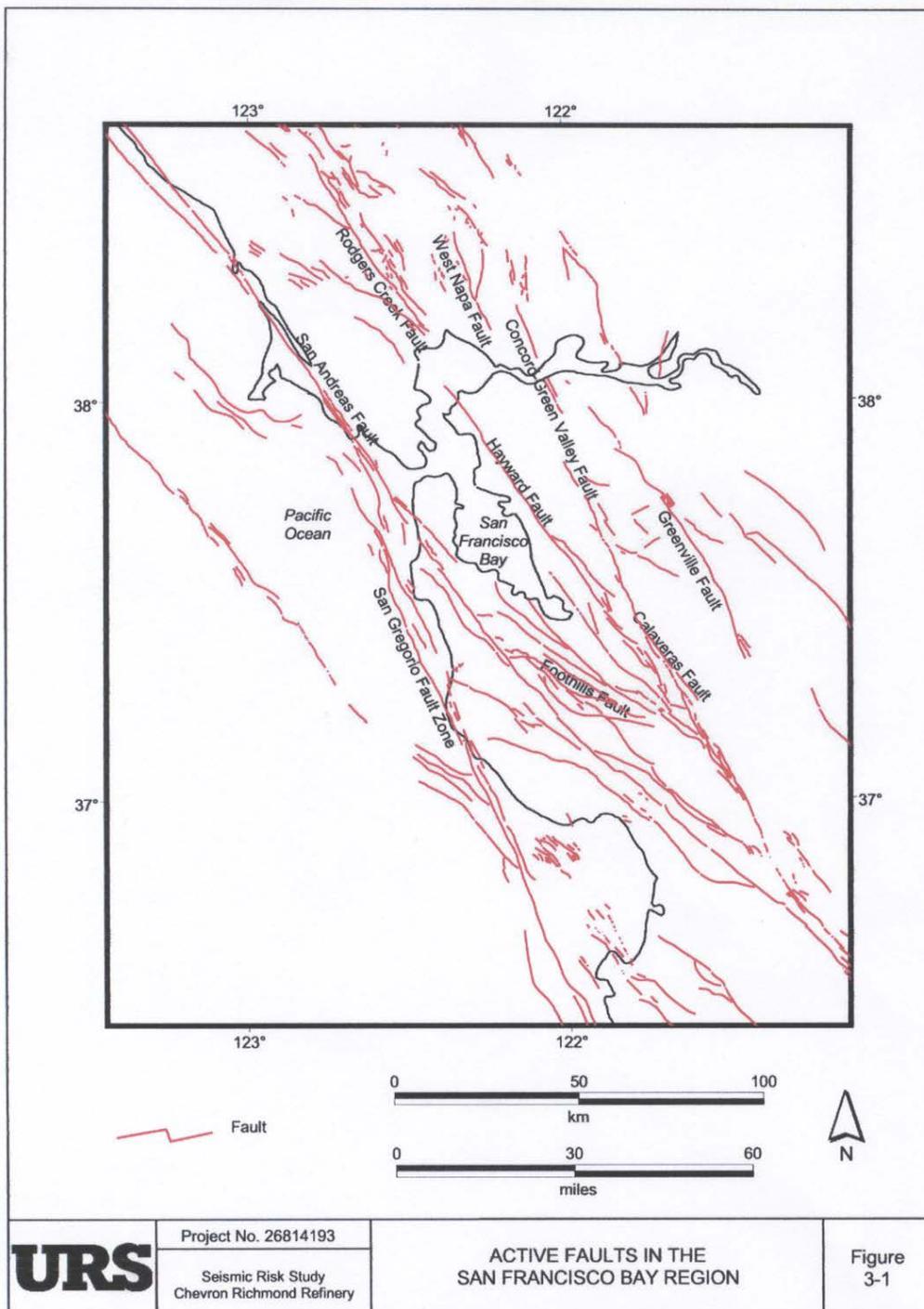
This fault is the principal active fault west of the San Andreas fault in the coastal region of central California. The fault extends from just offshore of Point Sur, northward to Bolinas Lagoon, where it merges with the North Coast segment of the San Andreas.

Historical Earthquakes

The majority of the historical seismicity in the San Francisco Bay Region is associated with the major faults of the San Andreas Fault System. There have been 14 earthquakes of approximately moment magnitude (M) 6.0 or greater in the San Francisco Bay region in historical times.

Figure XV-1

Active Faults in the San Francisco Bay Region



XVI. Relationship of the HWTSF to the 100-Year Floodplain

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- A. Location of the HWTSF and the 100-Year Floodplain

XVI. Relationship of the HWTSF to the 100-Year Floodplain

A. Location of the HWTSF and the 100-Year Floodplain

The boundaries of the Chevron Refinery, including the location of the Hazardous Waste Treatment and Storage Facility, are shown on the Federal Insurance Administration's Flood Insurance Rate Maps (FIRMs), Maps #9-a through 9-d. These maps indicate that the HWTSF is not located within the 100-year floodplain.

The FIRMs show the limits, evaluations, and depths of the Special Flood Hazard Area (SFHA), also known as the 100-year flooding event, defined as a flood having a 1% chance of occurring within any given year. On the maps, the SFHA are shaded in blue.

The areas of lesser flood hazard, which are the areas outside the SFHA, include Zone X, which is general shaded or unshaded in grey. These maps show that the majority of the Refinery, including the entire HWTSF, lies within Zone X area, outside the limits of the 100-year flood.

XVII. Closure Plan

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XVII. Closure Plan

A. Closure Plan, General

This Closure Plan for Chevron's Hazardous Waste Treatment and Storage Facility (HWTsf) has been prepared to meet all requirements of CCR Title 22, Division 4.5, Chapter 14, Article 7. The following outline is intended to serve as a practical manual to direct closure activities at the HWTsf. Specifically, the Closure Plan outline provides guidance for dismantling, decontamination, sampling, analysis, and disposal activities for closure of the five waste handling areas of the HWTsf in a safe and secure manner that will minimize the need for further maintenance at the HWTsf and the potential for post-closure escape of hazardous constituents to soil, surface water, groundwater, or the atmosphere.

- Appropriate personal protective equipment will be worn for all closure operations.
- All materials identified as hazardous waste will be treated onsite or transported off-site, using manifests and hazardous waste transporters, to a permitted hazardous waste facility for treatment or disposal.

1. Closure Plan Amendment

Modifications to any part of this Closure Plan will require a permit modification per Title 22, §66270.42. The Closure Plan will be reviewed by hazardous waste operations personnel and environmental staff and modifications to the Closure Plan will be made whenever any modification is made to:

- The Processes in the Operation Plan
- Quantities or Types of Wastes Treated and/or Stored at the HWTsf

2. HWTsf Description, Location, and Site Layout

See Section I, HWTsf Description.

3. Vessel, Container, and Equipment Inventory

See Section V, Waste Management Equipment.

4. Maximum Waste Inventory

The maximum waste inventory that may be present in the HWTsf at any one time is detailed in Table VIII-2. The quantities are based on the assumption that the HWTsf will not be expanded during the years between 2016 and anticipated HWTsf closure in 2066. If HWTsf expansion, changes in HWTsf operations, or changes in the expected date of closure occur in the future, it will be necessary to modify this document to address the changes, as required by CCR Title 22.

5. Types of hazardous materials handled at the HWTsf.

The hazardous materials handled at the HWTsf are detailed in Table VIII-1.

6. Final Destinations of Hazardous Materials

Hazardous waste will be transported for recycle, treatment or disposal to an exempt or permitted hazardous waste facility. Non-hazardous waste will be reused or sent for off-site recycling/disposal.

B. Final Closure Schedule of Activities

All hazardous waste in the HWTSF at the time of closure must be treated and/or removed within 90 days. If it appears that it will take longer than 90 days, a permit modification requesting an extension of time will be submitted at least 30 days prior to expiration of the 90 days. If an unexpected event occurs that necessitates an extension beyond the 90 days, a permit modification will be submitted not more than 30 days after the event occurred. Submittal must, however, still be within the 90-day period.

Final closure activities must be completed within 180 days. An extension may be approved by the DTSC if specified requirements are met per Title 22 CCR Division 4.5, Chapter 14, Article 7. Hazardous waste generated during closure activities has 90 days after generation to be shipped off-site to an approved hazardous waste facility. To close the HWTSF in compliance with applicable state requirements, the following closure schedule provides approximate milestones in the closure procedures that will allow tracking of the progress of closure. A closure checklist outlining this schedule is included as Figure XVII-1.

Step 1- DTSC Notification

Chevron will notify the Department of Toxic Substances Control, Berkeley and/or Sacramento offices, by certified mail at least 45 days prior to the date on which final closure will begin. For anticipated HWTSF closure in 2066, it is expected that closure notification will be given on or before November 17, 2065.

Step 2- Cessation of Additional Hazardous Waste Deliveries

No additional hazardous wastes will be accepted at the HWTSF beginning on the day designated to be the first day of closure. For anticipated HWTSF closure in 2066, wastes will no longer be accepted at the site is after the end of the working day on Friday, December 29, 2065.

Step 3- Waste Inventory

Within one (1) week of the beginning of closure activities, an inventory will be taken of the maximum quantity of solid and liquid hazardous waste present within the HWTSF area, including wastes in the storage and process vessels, treatment systems, associated hoses and piping, solid waste storage bins, and drums. In addition, an inventory of waste treatment chemicals will be taken.

Step 4- Final Waste Treatment

Within the first 90 days, hazardous wastes that are present at the HWTWF at the time of closure will be treated and/or transported off-site to disposal. Hazardous waste that is generated during closure activities has 90 days after generation to be shipped off-site to an approved hazardous waste facility. This Closure Plan assumes that the Refinery effluent treatment system will still be operational during closure of the HWTSF.

Following the last treatment through each treatment system, the entire treatment system will be flushed with clean water. The wash water will be pumped to a designated clean, steel vapor-tight vessel or vacuum truck from which water samples will be obtained. If a certified laboratory analysis of the water shows that it is not hazardous and meets the NPDES requirements for discharge into the Refinery's

effluent system, it will be drained to the HWTSE main sump. Water from the sump will be pumped to the Refinery's API separator prior to discharge to the Refinery's effluent treatment system.

Step 5- Equipment Cleaning, Dismantling, and Decontamination Activities

All vessels, pipes, pumps, structures, tools and fittings used to handle, treat, transfer or store hazardous materials will be washed, flushed, neutralized, and/or thoroughly steam-cleaned to remove residual hazardous substances, as described in detail in Section C. The metal buildings for storing drummed wastes in Area I will be cleaned and removed for reuse. The decontamination trailer and off-site office trailer will be towed away for reuse. All leased vessels will be cleaned and returned to the contract company. The remaining equipment will be dismantled and taken to a third party vendor, generally for its scrap value.

Step 6- HWTSE Decontamination

The concrete pads at Areas II, IV, and V will be steam-cleaned; asphalt paving over the entire site and at areas I and III will be washed using a cold, high-pressure water jet. Sumps will be pressure washed and flushed. Storm drain lines will be flushed with a high-volume water stream. All remaining hazardous waste generated during the closure activities will be managed within 90 days.

Step 7- Contamination Testing

To close the HWTSE, contamination testing of the concrete pads, asphalt, and soils beneath the concrete and asphalt will be conducted, as described in Section D. If testing indicates the presence of contamination above levels of concern, the contaminated asphalt, concrete, and/or contaminated soil will be removed and transported offsite for management at an approved hazardous waste facility. Refer to Section F for discussion of cleanup evaluation criteria.

Step 8- Closure Certification

Oversight of closure procedures and activities will be provided by Chevron personnel. However, all closure activities will be performed by a third-party contractor. The work will be inspected by an independent, qualified Professional Engineer registered in the State of California.

Table XVII -1 Closure Timeline

At Least 45 Days Prior to Start of Closure	Chevron will notify the DTSC Berkeley and/or Sacramento offices by certified mail at least 45 days prior to the date on which final closure will begin. It is expected that closure notification will be given on or before November 17, 2065.
First Day Of Closure	No additional hazardous wastes will be accepted at the HWTSF beginning on the day designated to be the first day of closure. The anticipated time when wastes will no longer be accepted at the HWTSF is at the end of the day on Friday, December 29, 2065.
Week 1	Within 1 week of the ceasing of operations, an inventory will be taken of the maximum quantity of hazardous waste present within the HWTSF, including wastes in the storage and process vessels, treatment systems, associated hoses and piping, solid waste storage bins, and drums. In addition, an inventory of waste treatment chemicals will be taken.
Weeks 1-8	Treat all wastes and wastewater requiring treatment per Section C.
Weeks 1-12 (90 days)	Hazardous wastes will be treated and removed from the HWTSF within 90 days of receipt of the final volume of wastes.
Weeks 5-10	Decontaminate all bins and vessels per Section C. Clean vessels and containers will be returned to the appropriate contract rental company. Decontaminate and dismantle all remaining waste handling equipment and facilities per Section C.
Weeks 11-12	Decontaminate all site surfaces, including concrete and asphalt pads, sumps, and drains per Section C.
Weeks 12-18	Sample and analyze materials per Section D.
Weeks 12-25 (180 days)	Final decontamination activities. Dispose of wastewater per Section C. Manage all contaminated trash generated during closure activities to an approved off-site facility.
Weeks 25-32 (60 days after closure)	Certification Report of closure by registered Engineer, including compilation of all closure documentation and records, report of all closure activities based on oversight and analysis of laboratory data within 60 days of closure.
Weeks 5-25	Ongoing oversight of closure activities by individual or company providing certification.

C. Area-Specific Closure Activities

The following sections describe specific details of closure of the five waste management areas. The order in which the various waste management areas will be closed may differ from the order in which they are numbered and discussed in this section. Details described in these sections include disposal, dismantling, and decontamination activities. Sampling protocol and laboratory analytical methods are described in Section D. Appropriate personal protective equipment will be worn for all closure operations. Following closure, all contaminated equipment and used protective gear will be cleaned or disposed of as hazardous waste. A Waste Analysis Plan for the HWTSF is included in Section VIII of this Operation Plan.

1. Specific Closure Activities for Non-contact and Clean Supplies and Equipment

The first closure activity will be to remove from the HWTSF area unneeded equipment and supplies that have not been in contact with hazardous materials. This includes unopened laboratory supplies, unused personal protective equipment, unused firefighting equipment, and unused process chemicals. A sufficient quantity of supplies and equipment will be retained for use during actual closure activities.

Non-contact and clean equipment and supplies will be removed for reuse or disposed in accordance with applicable requirements for specific process chemicals.

2. Specific Closure Activities for Area I (Drummed Waste Storage Area)

- a. All remaining drums will be removed from both buildings, for off-site management at an approved hazardous waste facility. The wastes will be handled according to the operational procedures detailed in Section VII of this Operations Plan.
- b. All interior and exterior surfaces of the metal buildings, including sumps, will be steam-cleaned and washed (if necessary), using a cleaner approved for use at the refinery.
- c. All cleaning residues and rinsate will be pumped to a designated clean, vapor-tight vessel or vacuum truck and will be sampled and analyzed for the major hazardous constituents stored in the area.
- d. Treatment and disposal of cleaning residues and rinsate will be determined from the analytical results. Cleaning residues and rinsate will be disposed of off-site as hazardous wastes if the analyses indicate hazardous levels of any constituents. If the water tests non-hazardous, it will be discharged to the HWTSE main sump.
- e. The metal buildings will be cleaned until they test non-hazardous, based on surface wipe tests on the interior walls and sumps. Once cleaned, the buildings will be removed for reuse.
- f. The asphalt pavement beneath and around the buildings will be washed with a cold, high-pressure water stream.
- g. The asphalt pavement beneath and surrounding the buildings and underlying soils will be sampled and analyzed per section D. If the asphalt analyses indicate presence of contamination, the asphalt will be cleaned and resampled. If cleaning is determined to be infeasible, the contaminated asphalt will be removed and disposed of as hazardous waste. If analyses indicate the underlying soil samples from a depth of 2 feet are contaminated, the soil sample from a depth of 5 to 7 feet will be analyzed. If contamination is present at the 5 to 7 feet depth, the soil will be excavated to a depth no greater than 1 foot above the groundwater table, or to approximately 7 feet. The excavated soil will be disposed of at an appropriate disposal facility. If the soil is contaminated at a depth of 7 feet, it will be necessary to determine whether the underlying groundwater has been affected. The specific requirements for such a groundwater contamination investigation are site-specific and are beyond the scope of this Closure Plan. A work plan for further groundwater investigation will be provided by a qualified hydrogeologist at the time if the need arises.

3. Specific Closure Procedures for Area II (Neutralization Area)

The neutralization system is comprised of two polyethylene vessels. Bulk waste corrosive liquids and spent acids are pumped into the vessels and are stored, or neutralized. The vessels are situated on a separate concrete pad in the southwestern corner of the HWTS Facility.

A subsurface, valved 10 inch-diameter drain line carries liquid from the sumps to the HWTSF main sump. This drain is equipped with a valve which is opened manually to allow water to discharge to the main sump. For closure, the following steps will be taken:

- a. After the final batch of waste has been neutralized and the vessels emptied, the vessels will be rinsed with clean water and emptied again. The two vessels and associated fittings, valves, hoses, and pumps will be disassembled and drained into 55-gallon drums. Rinsate liquid will be analyzed to determine if it is hazardous. If hazardous, the draining liquid will be transported to proper disposal off-site. If not hazardous, the rinsate will be disposed of into the HWTSF main sump.
- b. The interior of the tanks, fittings, hoses, and pumps will be steam-cleaned and water washed with a refinery approved cleaner.
- c. Following decontamination, the vessels will be returned to the contract company. The cleaned fittings, valves and pumps will be removed for reuse.
- d. The concrete pad and sumps will be steam-cleaned and washed (if necessary) with an approved cleaner.
- e. The concrete will be sampled and tested per section D. In addition, soils beneath the concrete will be sampled at areas where cracking of the concrete is observed. Concrete will be abandoned in place or disposed as hazardous waste, based on the analytical results. Soil contamination and possible groundwater effects (if any) will be addressed as described in Section C, 2 (g).
- f. All cleaning residues and rinsate will be pumped into a clean vapor-tight vessel, sampled and analyzed for pH and CAM metals, and disposed of based on the analytical results.

4. Specific Closure Procedures for Area III (Bulk Liquid Storage/Treatment Area)

Area III consists of seven vapor-tight steel storage vessels. The vapor-tight vessels are supplied by various contract companies. Area III occupies approximately 3555square feet of asphalt pad located in the northwest corner of the site. The asphalt pad is underlain by a 100 mil geomembrane liner.

- a. The final quantity of stored liquid and sludge waste will be treated, and all wastes will be drained from the vessels as the first step in the closure process.
- b. The vessels and associated hoses, fittings, valves and pumps will be drained, and cleaned, as described above in Sections C,3(a), (b), and (c).
- c. The asphalt pad will be washed with a cold, high pressure water stream.
- d. All cleaning residues and rinsate will be pumped into a clean vapor-tight vessel or vacuum truck, sampled and analyzed for CAM metals and disposed of as described above in sections C, 2(c) and (d).
- e. Following decontamination, the vessels, dewatering unit, fittings, valves, and pumps will be removed and returned to the contract company.

- f. The asphalt pad and underlying soil will be sampled and analyzed per section D. Based on the analytical results, the asphalt will be left in place or disposed as hazardous waste. The geomembrane liner will not be separately sampled, on the assumption that it will be bonded to the asphalt and will have the same characteristics, with respect to contamination, as the asphalt. Soil contamination and possible groundwater effects (if any) will be addressed as described in Section C,2(g).

5. Specific Closure procedures for area IV (Solid Waste Bin Storage/Treatment Area)

Bulk quantities of solid hazardous wastes are typically stored in 20 and/or 40-cubic yard, covered, bins in Area IV.

- a. All solid waste bins will be removed from Area IV and transported off-site for the wastes to be disposed of as hazardous waste. The bins will be returned to the contract companies.
- b. The concrete pads will be steam cleaned and washed (if necessary) with a refinery approved cleaner.
- c. All cleaning residues and rinsate will be pumped into a clean, vapor-tight vessel or vacuum truck, sampled, and analyzed for semi volatile organics and CAM metals, and disposed as described above in Sections C, 2(c) and (d).
- d. The concrete pad and underlying soil will be sampled and analyzed per section D. Based on the analytical results, the concrete will be left in place, or disposed of as hazardous waste. Soil contamination and possible groundwater effects (if any) will be addressed as described in Section C, 2 (g).

6. Specific Closure Procedures for Area V (Bulk Liquid/Sludge Treatment/Storage Area)

Area V occupies approximately 5022 square feet at the east end of a concrete pad in the central portion of the HWTS Facility. The concrete pad is underlain by a 100 mil thick engineered geomembrane. In Area V, bulk quantities of hazardous liquids and sludges are received and stored in vapor-tight steel vessels, leased from a contract company.

- a. The final quantity of liquid wastes and sludges will be treated by pumping through a dewatering unit. Following treatment, the dewatering unit will be drained and flushed. The filtrate will be discharged to the API separator and the solids will be sent off-site for disposal.
- b. The dewatering unit, vapor-tight vessels and associated hoses, fittings, valves and pumps will be dismantled, drained, and cleaned, as described above in Sections C,3(a), (b), and (c).
- c. The concrete pad will be steam cleaned and washed (if necessary) with a refinery approved cleaner.
- d. All cleaning residues and rinsates will be pumped into a clean vapor-tight vessel or vacuum truck, sampled and analyzed for volatile and semivolatile organics and CAM metals and disposed of as described above in sections C, 2(c) and (d).

- e. Following decontamination, the vessels, dewatering unit, fittings, valves, and pumps will be removed and returned to the contract company.
- f. The concrete pad and underlying soil will be sampled and analyzed per section D. Based on the analytical results, the concrete will be left in place or disposed as hazardous waste.

7. Specific Closure Procedures for HWTSE Main Sump and HWTSE Drainage System

Once all HWTSE waste storage and treatment areas and all waste handling and treatment equipment has been decontaminated and removed from the HWTSE area, the storm drain/HWTSE main sump will be sampled and analyzed for hazardous constituents. If hazardous constituents are present, at concentrations that make the water a hazardous waste, the water will be pumped into vacuum trucks for off-site treatment and disposal as described in Section C, 2(d). Additional system flushing will be done to try to complete cleaning of the system. If it can be cleaned to a non-hazardous condition, the system may be retained to serve future presently unidentified uses of the HWTSE area. The final, clean flushing water will be pumped to an API separator.

D. Site Contamination Testing

Small incidental spills have the greatest potential to occur in the neutralization area (Area II), the bulk liquid treatment and storage area (Area III), the liquid/sludge storage and treatment area (Area V), and in the handling area where trucks and drums are unloaded. Thus, contamination testing will be concentrated in these areas.

1. Potential Contaminants and Analytical Methods

The hazardous materials handled at the HWTSE are detailed in the Waste Analysis Plan, Section VIII. Samples of the pavement underlying Areas I - V and the soils underneath the pavement will be analyzed per Table XVII-1. At the time the analyses are performed, the current analytical methods and most appropriate parameters will be used.

The exact locations of all sampling sites will be chosen by a third-party geologist or engineer who is experienced in field sampling methods. Composite samples will be obtained from the concrete pads, asphalt paving, and underlying soils as follows. Sampling will be done per Table XVII-1, with modifications per "Field Manual for Grid Sampling of PCB (Polychlorinated Biphenyl) Spill Sites to Verify Cleanup" EPA-560/5-86-017 (PB-86-216942), Test Methods for Evaluating Solid Wastes: Physical and Chemical Methods" EPA SW-846 Chapter Nine with Updates, and ASTM D 34 standards D 4687-95(2001) Standard Guide for General Planning of Waste Sampling, D 63118(2003) Standard Guide for Generation of Environmental Data Related to Waste Management Activities: Selection and Optimization of Sampling Design.

2. Concrete Pads

Surface chips will be collected from around cracks or from discolored areas of the pad, if any are observed. Otherwise, subsamples of concrete chips from selected locations that have the highest

probability of having been contaminated from HWTSEF operations will be obtained from each pad where hazardous wastes were stored or handled. The samples will be obtained using a chipping hammer. Samples will be composited in the field, placed in sterile glass jars with lids, and stored in a cooler on ice for transport to the analytical laboratory. The estimated number of concrete samples to be collected and analytical procedures to be performed at each pad is shown in Table XVII-1. In addition, soil samples will be collected from beneath concrete pads giving priority to areas where cracking of the concrete is observed, by coring through the concrete to reach the soil.

3. Asphalt

Asphalt samples will be collected from selected locations that have the highest probability of having been contaminated from HWTSEF operations. The samples will be collected from the upper one inch of the pavement, using a hammer and chisel. The samples will be placed in sterile glass jars with lids (etc. as in D-2 above) except asphalt instead of concrete.

4. Soil

Soil samples will be obtained from beneath the asphalt pavement in Areas I and III, around the perimeters of concrete pads at Areas II, IV and V and at 15 random (shallow) locations around the HWTSEF. This sampling should be performed at spots where staining or cracking of the asphalt is observed, or in locations where water had the greatest potential to accumulate on the site. In addition, a total of 5 background soil samples will be obtained from locations off the HWTSEF site, in order to determine the natural, background levels of constituents in soil.

Soil samples will be obtained using a hollow-stem auger drilling rig equipped with a California split-spoon or a similar approved sampling device. All near-surface soil samples will be analyzed to determine whether hazardous constituents are present. If a surface sample tests contaminated, then the deeper soil sample from that boring also will be analyzed, in order to assess the vertical extent of soil contamination. Since the depth to the groundwater table is approximately 8 feet, the soil analysis from the 5-to-7-foot sample will provide information regarding the possibility of groundwater contamination. If groundwater contamination appears likely, a separate plan of investigation to assess the extent and characteristics of the contamination will be prepared and implemented.

The soil samples will be transferred from the sampler into appropriate sample containers. If the analytical results indicate the presence of contaminated concrete, asphalt or soils, then additional steps will be necessary to define the lateral and vertical extent of the contamination, and to decontaminate or dispose of the concrete, asphalt and or soil. Remedial actions may include, but are not limited to excavation and disposal of contaminated concrete, asphalt or soil, soil vapor extraction, or bioremediation. DTSC regulations specify that, in the event that soil decontamination is necessary but infeasible, the site must be closed as a landfill.

5. Surface Wipe Tests

Standard wipe tests as defined in 40 CFR Part 761 Subpart G will be performed on the inside walls of the drum storage buildings and all vessels to confirm decontamination effectiveness. The wipe test was developed for PCB contamination but is also applicable to other organic and metals contamination on solid surfaces.

E. Quality Assurance / Quality Control Plan

A Quality assurance/Quality Control (QA/QC) program will be included in the sampling program to provide data accuracy, precision, and completeness. The QA/QC program will include field duplicates, field blanks, and laboratory spikes.

F. Cleanup Evaluation Criteria

The evaluation criteria (threshold or action limit) for determining whether or not contamination of specific chemicals is present in the concrete pads, asphalt paving and/or soils will be dependent on the intended use of the HWTSF following closure. It is expected that the HWTS Facility will be used for Refinery related purposes such as for equipment storage. Appropriate criteria will be established according to background levels.

After background concentrations have been established for contaminants (target chemicals) measured in the composite samples (if any), additional sampling will be performed as necessary to establish the need for further cleaning. Cleaning and resampling will continue until the pads, soils, and pavement test at or below cleanup requirements for all parameters or until it is determined to be more feasible to dispose of any component as hazardous waste. In the event that removal of some material is necessary, testing may be conducted to determine the appropriate disposal option.

For the soil areas bordering the pads, applicable background concentrations, for any identified hazardous wastes, will be developed and presented to appropriate agencies for approval. If the level of contamination in any composite soil samples is above a given threshold limit for a contaminant, or suite of contaminants, additional sampling at several locations will be conducted, and the sample analyzed only for the specific target chemicals that exceed background levels. Additional excavation will be conducted, as necessary, in areas that are contaminated, followed by resampling, until levels of target chemicals are less than the cleanup criteria.

G. Closure Certification

Oversight of closure procedures and activities will be provided by a registered engineer. Closure activities may be performed by a third-party contractor.

Certification of HWTSF closure will be submitted to the DTSC by registered mail for approval within 60 days after completing Final Closure plans. The certification will state that closure has been performed in accordance with the specifications provided in this Closure Plan and will be signed by the owner/operator and by an independent, qualified Professional Engineer registered in the State of California.

The Engineer will make several progress and milestone inspections during the course of the closure in order to certify that the decontamination and testing were performed correctly. These inspections may include at least the following:

- Review of maximum waste inventory.
- Site visits during and following completion of dismantling, cleaning, and disposal activities, and equipment decontamination for each waste management area.
- Site visit during contamination testing.

- Site visit following contamination testing, when closure is complete.

The closure certification will be kept on file with the environmental staff until the DTSC releases the Refinery from the financial assurance requirements for closure.

H. Closure Cost Estimate

Closure cost estimates were prepared for the following facets of site operation:

- Five waste handling areas (including concrete pads, asphalt, and underlying soil)
- Containment facilities
- Sumps and drainage systems

In accordance with 22CCR, §66264.142, the estimated closure costs were based on the following:

- A point in time in the HWTSE's active life when the extent and manner of its operation would make closure the most expensive
- Costs to the owner of hiring a third party to perform all work necessary to close The HWTSE
- Zero salvage value that may be realized with the sale of hazardous waste HWTSE structures or equipment, land, or other assets associated with the HWTSE

Based on experience operating the HWTSE, and on the types of operations performed at the HWTSE, it is expected that there will be no significant contamination of asphalt, concrete or soils within the HWTSE area, and that clean closure of the HWTSE will be achieved and documented by data collected during closure. Accordingly, the closure cost estimates do not include any allowances for HWTSE post-closure maintenance or monitoring. Clean closure will minimize the potential for post closure releases of contaminants.

The estimated cost of closure is \$1,325,000. Annual modifications to the closure cost estimates to account for inflation will be made. Figure XVII-2 provides a summary of the closure cost estimate for the HWTSE.

**Table XVII-2
Sampling and Analysis Plan**

Area to be Sampled	Medium Sampled	Number of Samples	Analytical Parameters/Methods(s)*
I: Small Quantity Container Storage Area	asphalt; soil; wipe tests	6 samples in each medium** at each depth (18 samples) and 6 wipe tests	Volatile and Semi-volatile Organics/8260B, 8270 PCBs/8082 (PCBs) Sulfides/376.2 CAM Metals*/6010 and/or 7000 series
II: Neutralization Area	concrete; soil	5 composites in each medium** at each depth (15 samples) and 6 wipe tests	CAM Metals/6010 and/or 7000 series pH/105.1
III: Bulk Liquid Storage/Metals Precipitation	asphalt; soil	6 composites in each medium** at each depth (18 samples) and 21 wipe tests	CAM Metals/6010 and/or 7000 series
IV: Solid Waste Bin Storage	concrete; soil	6 composites in each medium** and at each depth (18 samples)	Extractable organics/8270 CAM Metals/6010 and/or 7000 series
V: Liquid/Sludge Storage	concrete; soil	6 composite in each medium** at each depth (18 samples) and 15 wipe tests	Volatile Organics/8260B Extractable Organics/8270 CAM Metals/6010 and/or 7000 series
VI: Random, in areas where runoff/liquid wastes most likely to have accumulated; in area with stains, if any.	asphalt; soil	15 samples in each medium** at each depth (45 samples)	Priority Pollutant Scan (includes 8082, 8260B, 8270, CAM Metals, Cyanide/335, and Phenols/420)
Offsite "background" samples	soil	5 samples (shallow)	Priority Pollutant Scan (includes 8082, 8260B, 8270, CAM Metals, Cyanide/335, and Phenols/420)
Decontamination Washwater	liquid	4 samples	Priority Pollutant Scan (includes 8082, 8260B, 8270, CAM Metals, Cyanide/335, and Phenols/420)

- Methods are described in Test Methods for Evaluating Solid Waste, EPA, 1986 or in Methods for Chemical Analysis of Water and Wastes, EPA, 1979.

** Soil samples will be obtained from 2 depths: one at a depth of 1 to 2 feet, and another at a depth of 5 to 7 feet. The bottom sample should be analyzed only if the analysis of the top sample indicates the presence of contamination (refer to text).

**Figure XVIII-1
Closure Plan Checklist**

The Hazardous Waste Treatment and Storage Facility (HWTSF) has been in hazardous waste service. The closing of the HWTSF will require that special procedures are followed and documented. The documentation will be done by an independent qualified professional engineer registered in California. The following procedure is a guide to ensure that all steps are completed.

Closure Step	Date/Time
Closure begins (no additional wastes received).	_____
Inventory of all wastes and equipment remaining in HWTSF.	_____
Treat, package and remove all wastes from the HWTSF (within 90 days of receipt of the final volume of waste).	_____
Package and removal of all miscellaneous equipment from the HWTSF.	_____
Decontaminate site surfaces.	_____
Perform site sampling per approved Closure Plan.	_____
If contamination of site surfaces exists, decontaminate and resample. If contamination does not exist denote here and go on to next step.	_____
If asphalt/concrete contamination exists and removal was necessary, sample underlying soil. If no contamination exists denote here and go on to closure certification step.	_____
If underlying soil is contaminated and removal is necessary, sample groundwater. If contamination exists, notify DTSC and discuss remediation. If no contamination exists, denote here and go on to closure certification step.	_____
Certify closure. Submit independent registered engineer's closure certification and summary of closure activities to the Department of Toxic Substances Control. Summary report should include results of analyses, volume of waste produced, copies of hazardous waste manifests for all wastes shipped offsite, and certification in CCR Title 22, § 66264.115	_____

*Figure XVII-2
HWTS Facility Closure Cost Estimate*

Task	Cost, 2016
Treatment, Transportation, and Disposal	\$766,049
Removal of Vessels and HWTSF Equipment	\$3,700
Decontaminate All Waste management Areas and Entire Site	\$133,020
Sampling and Analysis of Asphalt, Concrete, Subsurface Soils and Wash Waters	\$77,117
Closure Certification	\$21,840
10% 3 rd Party Oversight	\$100,173
20% Contingency	\$220,380
Sub Total Closure Costs	\$1,322,277
Total Estimated Closure Costs	\$1,325,000

Attachment XVII-1

Summary

HWTS Facility Closure Cost Estimate

	Treatment & Disposal	Decontamination of Areas & Vessels	Sampling & Analysis	Removal of Equipment	Certification of Closure		
A rea I	\$ 45,109	\$ 3,783	\$ 14,360		\$ 3,840	\$	66,892
A rea II	\$ 17,370	\$ 4,889	\$ 3,697	\$ 300	\$ 3,840	\$	29,896
A rea III	\$ 204,764	\$ 20,714	\$ 4,256	\$ 1,400	\$ 3,840	\$	234,775
A rea IV	\$ 265,400	\$ 7,757	\$ 8,036		\$ 3,840	\$	284,833
A rea V	\$ 227,365	\$ 29,473	\$ 9,746	\$ 2,000	\$ 3,840	\$	272,224
General Area	\$ 6,041	\$ 66,404	\$ 37,020		\$ 3,840	\$	113,105
Sub Total	\$ 766,049	\$ 133,020	\$ 77,117	\$ 3,700	\$ 21,840	\$ 1,001,725	Sub Total
						\$ 100,173	10% 3rd Party Oversight
						\$ 1,101,898	Sub Total including Oversight
						\$ 220,380	20% Contingency
						\$ 1,322,277	Total

Area I

Remove Waste	# or hrs	Area I
Handling	18	\$ 540
Sample liquid drums	14	\$ 7,714
Sample solid drums	14	\$ 7,574
Disposal Non-RCRA	20	\$ 3,627
Disposal RCRA	64	\$ 25,654
Total		\$ 45,109
Decontamination of Containment Area		
Sq.Ft. surface area	1998	
Dry Sweep asphalt	Hours	
Labor	8.7	\$ 520
Equip		\$ 100
Pressure Wash/Steam Clean		
Labor	8.7	\$ 520
Equip	1	\$ 224
Cleaner		\$ 110
Decontaminate Drum Storage Buildings		
Sq.Ft. surface area	2022	
Pressure Wash/Steam Clean		
Labor	8.7	\$ 524
Equip	1	\$ 224
Cleaner		\$ 110
Total		\$ 2,332
Wash Water		
Gallons Generated	2814	
Storage	1 30	\$ 900
Sampling	1	\$ 551
Total		\$ 1,451

Drum disposal est.			
Trans & Disposal	Quantity	Rate per each	
Total Drum(s) (55 gallon size)	64		
Non-RCRA Disposal			
Transportation	20	\$17.85	\$357.00
Solids (direct Landfill disposal)		\$91.88	\$0.00
Liquids/Sludge Disposal	10	\$120.00	\$1,200.00
Solids (require stabilization)	10	\$207.00	\$2,070.00
RCRA Incineration Aragonite, Utah			Total Non-RCRA \$3,627.00
UT HZRD Fee	64	\$28.00	\$1,792.00
Transportation	64	\$17.85	\$1,142.40
Solids Incineration	32	\$450.00	\$14,400.00
Fuel Sludge for Incineration		\$450.00	\$0.00
Organic Liquid, Pumpable Fuel		\$105.00	\$0.00
Aqueous Solution	32	\$260.00	\$8,320.00
			Total RCRA \$25,654.40

Sampling & Analysis	Cost to core asphalt		
Core Samples	6	\$	141
Soil boring costs	6	\$	3,246
Soil samples	6	\$	1,235
Wipe Tests	12	\$	6,492
	6	\$	3,246
Total		\$	14,360

Certification of Closure \$ 3,640

Total Area I Closure Costs \$66,892

Attachment XVII-1 - continued

Area II

			<u>Area II</u>
<u>Remove Waste</u>			
Trans/Disposal Liquids	# or hrs		\$
13000			17,030
Sample liquid	2		340
		Total	\$ 17,370
<u>Decontamination of Containment Area</u>			
Sq.Ft. surface area	1144		
<u>Dry Sweep</u>			
Labor	5.8	\$	349
Equip		\$	100
<u>Pressure Wash/Steam Clean</u>			
Labor	5.8	\$	349
Equip	1	\$	224
Cleaner		\$	110
<u>Decontaminate Vessels</u>			
Sq.Ft. surface area	1080		
<u>Pressure Wash/Steam Clean</u>			
Labor	5.5	\$	332
Equip	1	\$	224
Cleaner		\$	110
		Total	\$ 1,798
<u>Wash Water</u>			
Gallons Generated	1543		
Storage	1 30	\$	900
Sampling	1	\$	170
Trans & Disposal		\$	2,021
		Total	\$ 3,091

<u>Sampling & Analysis</u>		
Cost to core concrete	5	\$ 118
Core Samples	5	\$ 850
Soil boring costs	5	\$ 1,029
Soil samples	10	\$ 1,700
Wipe Tests for Vessels	6	\$ 2,888
	Total	\$ 3,697

Return Poly Vessels \$ 300

Certification of Closure \$ 3,640

Total Area II Closure Cost \$ 29,896

Area III

			<u>Area III</u>
<u>Remove Waste</u>			
Trans/disposal liquids	# or hrs		\$
155,400			203,574
Sample liquids	7	\$	1,190
		Total	\$ 204,764
<u>Decontamination of Containment Area</u>			
Sq.Ft. surface area	3555		
<u>Dry Sweep</u>			
Labor	13.9	\$	831
Equip		\$	100
<u>Pressure Wash/Steam Clean</u>			
Labor	13.9	\$	831
Equip	1	\$	224
Cleaner		\$	220
<u>Decontaminate Vessels</u>			
Sq.Ft. surface area	11900		
<u>Pressure Wash/Steam Clean</u>			
Labor	41.7	\$	2,500
Equip	1.5	\$	338
Cleaner		\$	440
		Total	\$ 5,482
<u>Wash Water</u>			
Gallons Generated	10819		
Storage	1 30	\$	900
Sampling	1	\$	160
Trans & Disposal		\$	14,172
		Total	\$ 15,232

<u>Sampling & Analysis</u>		
Cost to core asph:	6	\$ 141
Core Samples	6	\$ 960
Soil boring costs	6	\$ 1,235
Soil samples	12	\$ 1,920
Wipe Tests for Vessels	21	\$ 10,101
	Total	\$ 4,256

Return Frac vessels 7 \$ 1,400

Certification of Closure \$ 3,640

Total Area III Closure Costs \$ 234,775

Attachment XVII-1 - continued

Area IV

			<u>Area IV</u>
<u>Remove Waste</u>			
	# or hrs		
Sample solids	20	\$	7,400
Trans/disposal solids		\$	258,000
	Total		\$265,400
<u>Decontamination of Containment Area</u>			
Sq.Ft. surface area	4482		
<u>Dry Sweep</u>			
Labor	16.9	\$	1,016
Equip		\$	100
<u>Pressure Wash/Steam Clean</u>			
Labor	16.9	\$	1,016
Equip	1	\$	224
Cleaner		\$	220
<u>Decontaminate Vessels</u>			
Sq.Ft. surface area	0		
<u>Pressure Wash/Steam Clean</u>			
Labor	0.0	\$	-
Equip	0	\$	-
Cleaner		\$	-
	Total	\$	2,577
<u>Wash Water</u>			
Gallons Generated	3137		
Storage	1 30	\$	900
Sampling	1	\$	170
Trans & Disposal			4110
	Total	\$	5,180

<u>Trans & Disposal</u>	Quantity	Days	
Bin Rental	20	60	\$10,200
Bin Yard Movements	auto calc		\$2,200
<u>RCRA Treatment/Disposal Aragonite</u>			
Transportation	20		\$44,000
Solids Disposal	360		\$201,600
	Total		\$258,000

<u>Sampling & Analysis</u>			
Cost to core con cr	6	\$	141
Core Samples	6	\$	2,220
Soil boring costs	6	\$	1,235
Soil samples	12	\$	4,440
	Total	\$	8,036

Certification of Closure \$ 3,640

Total Area IV Closure Costs \$ 284,833

Area V

			<u>Area V</u>
<u>Remove Waste</u>			
	# or hrs		
Treat sludge (bbls)	5000	\$	75,000
Sample liquids	10	\$	4,650
Sample solids	12	\$	5,580
Disposal solids	217	\$	142,135
	Total	\$	227,365
<u>Decontamination of Containment Area</u>			
Sq.Ft. surface area	5022		
<u>Dry Sweep</u>			
Labor	18.7	\$	1,124
Equip		\$	100
<u>Pressure Wash/Steam Clean</u>			
Labor	18.7	\$	1,124
Equip	1	\$	224
Cleaner		\$	220
<u>Decontaminate Vessels</u>			
Sq.Ft. surface area	17000		
<u>Pressure Wash/Steam Clean</u>			
Labor	58.7	\$	3,520
Equip	1.5	\$	336
Cleaner		\$	660
	Total	\$	7,309
<u>Wash Water</u>			
Gallons Generated	15415		
Storage	1 60	\$	1,800
Sampling	1	\$	170
Trans and Disposal		\$	20,194
	Total	\$	22,164

<u>Trans & Disposal</u>	Quantity	Days	
Bin Rental	17	60	\$8,513
Bin Yard Movements	auto calc		\$1,836
<u>RCRA Treatment/Recycling Canada</u>			
Transportation	17		\$84,048
Solids Disposal	217		\$47,740
	Total		\$142,135

<u>Sampling & Analysis</u>			
Cost to core con cr	6	\$	141
Core Samples	6	\$	2,790
Soil boring costs	6	\$	1,235
Soil samples	12	\$	5,580
Wipe Tests for Vessels	15	\$	7,215
	Total	\$	9,746

Return Frac Vessels 10 \$ 2,000

Certification of Closure \$ 3,640

Total Area V Closure Cost \$ 272,224

Attachment XVII-1 – continued

General Area

General Area

<u>Remove Waste</u>			
Sample solid drums	# or hrs		
	2	\$	1,082
Disposal solids		\$	4,959
	<u>Total</u>	\$	<u>6,041</u>
<u>Decontamination of Containment Area</u>			
Sq. Ft. surface area	46182		
<u>Dry Sweep</u>			
Labor	155.9	\$	9,358
Equip		\$	200
<u>Pressure Wash/Steam Clean</u>			
Labor	155.9	\$	9,358
Equip	1	\$	525
Cleaner		\$	2,200
<u>Decontaminate Main Sump</u>			
Sq. Ft. surface area	800		
<u>Pressure Wash/Steam Clean</u>			
Labor	4.7	\$	280
Equip	1	\$	224
Cleaner		\$	110
	<u>Total</u>	\$	<u>22,252</u>
<u>Wash Water</u>			
Gallons Generated	32887		
Storage	1 30	\$	900
Sampling	1	\$	170
Trans and Disposal		\$	43,082
	<u>Total</u>	\$	<u>44,152</u>

<u>Trans & Disposal</u>	Quantity	Rate per each	
Drum(s) (55 gallon size)	10		
RCRA Incineration Aragonite, Utah			
UT HZRD Fee	10	\$28.00	\$280.00
Transportation	10	\$17.85	\$178.50
Solids Incineration	10	\$450.00	\$4,500.00
<u>Total RCRA Disposal</u>			<u>\$4,958.50</u>

<u>Sampling & Analysis</u>			
	Cost to core asphalt	15	\$ 354
	Core Samples	15	\$ 9,765
	Soil boring costs	15	\$ 3,087
	Soil samples	30	\$19,530
<u>Offsite Background Samples</u>			
	Soil boring costs	5	\$ 1,029
	Soil samples	5	\$ 3,255
	<u>Total</u>		<u>\$37,020</u>

Certification of Closure \$ 3,640

Total General Area Closure Costs \$ 113,105

XVIII. Financial Responsibility

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- A. Financial Assurance Mechanism for HWTSF Closure
 - 1. Financial Assurance for Closure and Post-Closure Care and Liability Coverage

XVIII. Financial Responsibility

A. Financial Assurance Mechanism for HWTSF Closure

Chevron uses the Financial Test and Corporate Guarantee for Closure described in CCR Title 22, §66264.143(f)(1)(B) to demonstrate financial responsibility for closure and post-closure care and liability coverage. All required financial and insurance documents are submitted annually to the Department of Toxic Substances Control. A copy of the annual update for fiscal year 2015 is provided in this section. Included in the annual submittal are:

- Financial test letter signed by Chevron USA, Inc. on March 23, 2016
- Corporate Guarantee for Closure and Post-Closure Care
- Corporate Guarantee of Liability Coverage
- 2015 Chevron Form 10-K containing our Report of Independent Registered Public Accounting Firm
- Accountant's Special Report dated March 23, 2016
- Bond Rating Information

1. Financial Assurance for Closure and Post-Closure Care and Liability Coverage

See attached letter Financial Assurance for Closure and Post-Closure Care and Liability Coverage dated March 23, 2016.



Linda Muong
Financial Assurance Specialist

Chevron Environmental
Management Company
6101 Ballinger Canyon Road
San Ramon, CA 94583
Tel 925-790-3321
ldef@chevron.com

March 23, 2016

Department of Toxic Substances Control
Financial Responsibility Unit
8800 Cal Center Drive, 3rd Floor
Sacramento, CA 95826-3200

**Hazardous Waste Sites - California
Financial Assurance for Closure and Post-Closure Care and Liability Coverage**

Dear Financial Responsibility Unit Representative:

Attached, as required by California regulations, are the following Chevron Corporation items:

1. Financial Test Letter dated March 23, 2016.
2. Corporate Guarantee for Closure and Post-Closure Care.
3. Corporate Guarantee for Liability Coverage.
4. 2015 Chevron Form 10-K containing our Report of Independent Registered Public Accounting Firm.
5. Accountant's Special Report.
6. Bond Rating Information.

Where applicable, the inflation factor of 1.01% was applied as of February, 2016.

This document provides financial assurance for the following facilities:

CAT 060010283
Chevron U.S.A. Inc.
Westside Disposal Facility (aka EPC
Westside)
26244 Highway 33
Fellows, CA 93324

CAD 043237486
Chevron U.S.A. Inc.
940 Hensley Street
Richmond, CA 94804

CAD 008336901
Chevron U.S.A. Inc.
El Segundo Refinery
P.O. Box 97
El Segundo, CA 90245

CAD 009114919
Chevron U.S.A. Inc.
Richmond Refinery
P.O. Box 1272
Richmond, CA 94802

Hazardous Waste Sites - California
Financial Assurance for Closure
and Post-Closure Care
and Liability Coverage
March 23, 2016
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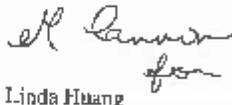
DTSC Calsites Database 44280006
Chevron Environmental Management Company
Calspray Site
135 Walker Street
Watsonville, CA 95076

Chevron Corporation has no TTUs. It does have one FTU:

CAD 043237486
Chevron U.S.A. Inc.
940 Hensley Street
Richmond, CA 94804

If you have any questions please call me at the number above.

Sincerely,


Linda Huang

Enclosures

cc: Gareth Feldstein
Brad Rogers
John Arnato
Lisa Duncan
Richard Sylvia
Michael Steinbrecher



Patricia E. Yarrington
Vice President and Chief Financial Officer

March 23, 2016

Department of Toxic Substances Control
Financial Responsibility Unit
8800 Cal Center Drive
Sacramento, CA 95826-3200

Re: Chevron U.S.A. Inc. – California Sites

Dear Financial Responsibility Unit Representative:

I am the Chief Financial Officer of Chevron Corporation, 6001 Bollinger Canyon Road, San Ramon, California. This letter is in support of the use of the financial test to demonstrate financial responsibility for liability coverage and closure and/or postclosure care, as specified in California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8.

The firm identified above is the owner or operator of the following facility(ies)/TTU(s) for which liability coverage for both sudden and nonsudden accidental occurrences is being demonstrated through the financial test specified in California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8, sections 66264.147 and 66265.147: Chevron Corporation does not own or operate any such facilities.

The firm identified above guarantees, through the guarantee specified in California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8, sections 66264.147 and 66265.147, liability coverage for both sudden and nonsudden accidental occurrences at the following facility(ies)/TTU(s) owned or operated by the following: See Attachment B.

The firm above is the direct or higher tier parent corporation of the owner or operator.

1. The firm identified above is the owner or operator of the following facilities/TTUs for which financial assurance for closure and/or postclosure or liability coverage is demonstrated through the financial test as specified in California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8 section 66264.143, subsection (f), section 66264.145, subsection (f), section 66265.143, subsection (e), and section 66265.145, subsection (e). Chevron Corporation does not own or operate any such facilities. The current closure and/or postclosure cost estimates covered by the test are shown for each facility/TTU: N/A.

2. The firm identified above guarantees, through the guarantee as specified in California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8, section 66264.143, subsection (f), section 66264.145, subsection (f), section 66265.143, subsection (e), and section 66265.145, subsection (e), the closure and/or postclosure care or liability coverage of the following facilities/TTUs owned or operated by the guaranteed party. See Attachments A and B. The current cost estimates for the closure or postclosure care so guaranteed are shown for each facility/TTU: See Attachment A.

3. In States where the U.S. Environmental Protection Agency is not administering the financial requirements of subpart H of 40 CFR parts 264 and 265, this firm as owner, operator or guarantor is demonstrating financial assurance for the closure or postclosure care of the following facilities/TTUs through the use of a test equivalent or substantially equivalent to the financial test specified in California

Chevron Corporation
6001 Bollinger Canyon Road, San Ramon, CA 94583
Tel 925 842-3232 Fax 925 842-6047

Department of Toxic Substances Control
 Financial Responsibility Form
 March 23, 2016
 Page 2

Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8, section 66264.143, subsection (f), section 66264.145, subsection (f), section 66265.143, subsection (e), and section 66265.145, subsection (e). See Attachment A. The current closure and/or postclosure cost estimates covered by such a test are shown for each facility/TTU; See Attachment A.

4. The firm identified above is the owner or operator of the following facilities/TTUs for which financial assurance for closure or, if a disposal facility, postclosure care, is not demonstrated either to U.S. Environmental Protection Agency or a State through the financial test or any other financial assurance mechanism as specified in California Code of Regulations, title 22, division 4.5, chapter 14 or 15, article 8 or equivalent or substantially equivalent State mechanism. Chevron Corporation does not own or operate such facilities. The current closure and/or postclosure cost estimates not covered by such financial assurance are shown for each facility/TTU: N/A.

5. The firm is the owner or operator or guarantor of the following Underground Injection Control facilities for which financial assurance for plugging and abandonment is required under 40 CFR part 144 and is assured through a financial test. See Attachment C. The current closure cost estimates are required by 40 CFR 144.62 are shown for each facility: See Attachment C.

This firm is required to file a Form 10K with the Securities and Exchange Commission (SEC) for the latest fiscal year.

The fiscal year of this firm ends on December 31. The figures for the following items marked with an asterisk are derived from this firm's independently audited, year-end financial statements for the latest completed fiscal year, ended December 31, 2015.

This firm is using Alternative II for Part A and Alternative II for Part B.

Part A. Liability Coverage for Accidental Occurrences

Alternative II

1. Amount of annual aggregate liability coverage to be demonstrated	\$ 110,000,000
2. Current bond rating of most recent issuance and name of rating service:	A-1 Moody's Investor Services AA+ Standard and Poor's
3. Date of issuance of bond	\$5 billion issued on November 17, 2015
4. Date of maturity of bond	\$1.50 billion due November 9, 2017 \$1.50 billion due November 16, 2018 \$1.25 billion due November 17, 2020 \$0.75 billion due November 17, 2025
5. Tangible net worth*	\$ 149,009,000,000
6. Total assets in the United States*	\$ 72,891,000,000

Department of Toxic Substances Control
 Financial Responsibility Unit
 March 23, 2016
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- 7. Is line 5 at least \$10 million? Yes
- 8. Is line 5 at least 6 times line 1? Yes
- 9. Are at least 90 percent of assets located in the United States? * No
- 10. Is line 6 at least 6 times line 1? Yes

Part B. Closure or Postclosure Care and Liability Coverage

ALTERNATIVE #1

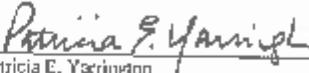
- 1. Sum of current closure and postclosure cost estimates \$ 392,129,787
- 2. Amount of annual aggregate liability coverage to be demonstrated \$ 119,000,000
- 3. Sum of lines 1 and 2 \$ 502,129,787
- 4. Current bond rating of most recent issuance and name of rating service: Aa1
Moody's Investor Services
AA-
Standard and Poor's
- 5. Date of issuance of bond \$5 billion issued on November 17, 2015
- 6. Date of maturity of bond \$1.50 billion due November 9, 2017
\$1.50 billion due November 16, 2018
\$1.25 billion due November 17, 2020
\$0.75 billion due November 17, 2025
- 7. Tangible net worth* \$ 149,009,000,000
- 8. Total assets in the U.S.* \$ 72,891,000,000
- 9. Is line 7 at least \$10 million? Yes
- 10. Is line 7 at least 6 times line 3? Yes
- 11. Are at least 90 percent of the firm's assets located in the United States? If not, complete line 12.* No
- 12. Is line 8 at least 6 times line 3? Yes

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Financial Responsibility Unit
March 23, 2016
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I hereby certify that the wording of this letter is identical to the wording as specified in California Code of Regulations, title 22, section 66264.151, subsection (g) and is being executed in accordance with the requirements of California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8.

March 23, 2016

CHEVRON CORPORATION


Patricia E. Yarrington
Vice President and Chief Financial Officer

GUARANTEE FOR LIABILITY COVERAGE

Department of Toxic Substances Control Financial Responsibility Section 8800 Cal Center Drive
Sacramento, California 95826

Guarantee made this 23rd day of March, 2016, by CHEVRON CORPORATION, a business corporation organized under the laws of the State of Delaware, herein referred to as guarantor. This guarantee is made on behalf of Chevron U.S.A. Inc. of 6001 Bollinger Canyon Road, San Ramon, California which is our subsidiary, to any and all third parties who have sustained or may sustain bodily injury or property damage caused by sudden and/or nonsudden accidental occurrences arising from operation of the facility(ies)/transportable treatment unit(s) (TTU) covered by this guarantee.

RECITALS

1. Guarantor meets or exceeds the financial test criteria and agrees to comply with the reporting requirements for guarantors as specified in California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8, sections 66264.147 and 66265.147.
2. Chevron U.S.A. Inc. owns or operates the following hazardous waste management facility(ies)/TTU(s) covered by this guarantee:

Facility	Liability Coverage (Per Occur./Annual Aggregate)
CAD 008336901 Chevron U.S.A. Inc. El Segundo Refinery 324 West El Segundo Blvd. El Segundo, CA 90245	Sudden Occurrences - \$1 million/\$2 million Non-sudden Occurrences - \$3 million/\$6 million
CAD 009114919 Chevron U.S.A. Inc. Richmond Refinery 841 Chevron Way Richmond, CA 94801-0627	Sudden Occurrences - \$1 million/\$2 million Non-sudden Occurrences - \$3 million/\$6 million
CAD 043237486 Chevron U.S.A. Inc. 940 Hensley Street Richmond, CA 94804	Sudden Occurrences - \$1 million/\$2 million Non-sudden occurrences - \$3 million/\$6 million
CAT 080010283 Chevron U.S.A. Inc. Westside Disposal Facility (aka EPC Westside) SE 1/4 Section 25, T31E, R22E, MDBM Fellows, CA	Sudden Occurrences - \$1 million/\$2 million Non-sudden Occurrences - \$3 million/\$6 million

This corporate guarantee satisfies California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8, third-party liability requirements for both sudden and nonsudden accidental occurrences in the above-named owner or operator facility(ies)/TTU(s) for coverage in the amount of \$1 million per facility/TTU per occurrence and \$6 million annual aggregate.

3. For value received from Chevron U.S.A. Inc., guarantor guarantees to any and all third parties who have sustained or may sustain bodily injury or property damage caused by sudden and/or nonsudden accidental occurrences arising from operations of the facility(ies)/TU(s) covered by this guarantee that in the event that Chevron U.S.A. Inc. fails to satisfy a judgment or award based on a determination of liability for bodily injury or property damage to third parties caused by sudden and/or nonsudden accidental occurrences, arising from the operation of the above-named facility(ies)/TU(s), or fails to pay an amount agreed to in settlement of a claim arising from or alleged to arise from such injury or damage, the guarantor will satisfy such judgment(s), award(s), or settlement agreement(s) up to the limits of coverage identified above.

4. Such obligation does not apply to the following:

(a) Bodily injury or property damage for which Chevron U.S.A. Inc. is obligated to pay damages by reason of the assumption of liability in a contract or agreement. This exclusion does not apply to liability for damages that Chevron U.S.A. Inc. would be obligated to pay in the absence of the contract or agreement.

(b) Any obligation of Chevron U.S.A. Inc. under a workers' compensation, disability benefits, or unemployment compensation law or any similar laws.

(c) Bodily injury to:

(1) An employee of Chevron U.S.A. Inc. arising from, and in the course of, employment by Chevron U.S.A. Inc.; or

(2) The spouse, child, parent, brother, or sister of that employee as a consequence of, or arising from, and in the course of employment by Chevron U.S.A. Inc. This exclusion applies:

(A) Whether Chevron U.S.A. Inc. may be liable as an employer or in any other capacity; and

(B) To any obligation to share damages with or repay another person who shall pay damages because of the injury to persons identified in paragraphs (A) and (B).

(d) Bodily injury or property damages arising out of the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle, or watercraft.

(e) Property damage to:

(1) Any property owned, rented, or occupied by Chevron U.S.A. Inc.;

(2) Premises that are sold, given away, or abandoned by Chevron U.S.A. Inc. if the property damage arises out of any part of those premises;

(3) Property loaned to Chevron U.S.A. Inc.;

(4) Personal property in the care, custody, or control of Chevron U.S.A. Inc.;

(5) That particular part of real property on which the Chevron U.S.A. Inc. or any contractor or subcontractors working directly or indirectly on behalf of the Chevron U.S.A. Inc. are performing operations, if the property damage arises out of these operations.

5. Guarantor agrees that if, at any time during or at the end of any fiscal year before termination of this guarantee, the guarantor fails to meet the financial test criteria, guarantor shall send within ninety (90) days, by certified mail, notice to the Department of Toxic Substances Control (DTSC) and to Chevron U.S.A. Inc. that he or she intends to provide alternate liability coverage as specified in California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8, sections 66264.147 and 66265.147, as applicable, in the name of Chevron U.S.A. Inc. Within 90 days after the end of such fiscal year, the guarantor shall establish such liability coverage unless Chevron U.S.A. Inc. has done so.
6. The guarantor agrees to notify the DTSC by certified mail of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), United States Code, naming guarantor as debtor, within ten (10) days after commencement of the proceedings.
7. Guarantor agrees that within thirty (30) days after being notified by the DTSC of a determination that the guarantor no longer meets the financial test criteria or that he or she is disallowed from continuing as a guarantor, he or she shall establish alternate liability coverage as specified in California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8, sections 66264.147 and 66265.147 in the name of Chevron U.S.A. Inc., unless the Chevron U.S.A. Inc. has done so.
8. Guarantor reserves the right to modify this agreement to take into account amendment or modification of the liability requirements set by California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8, sections 66264.147 and 66265.147, provided that such modification shall become effective only if DTSC does not disapprove the modification within thirty (30) days of receipt of notification of the modification.
9. Guarantor agrees to remain bound under this guarantee for so long as Chevron U.S.A. Inc. shall comply with the applicable requirements of California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8, sections 66264.147 and 66265.147 for the above-listed facility(ies)/TTU(s), except as provided in paragraph 10 of this agreement.
10. Guarantor may terminate this guarantee by sending notice by certified mail to DTSC, and to Chevron U.S.A. Inc., provided that this guarantee may not be terminated unless and until Chevron U.S.A. Inc. obtains, and DTSC approves alternate liability coverage complying with California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8, sections 66264.147 and 66265.147.
11. Guarantor hereby expressly waives notice of acceptance of this guarantee by any party.
12. Guarantor agrees that this guarantee is in addition to and does not affect any other responsibility or liability of the guarantor with respect to the covered facility(ies)/TTU(s).
13. The guarantor shall satisfy a third-party liability claim only on receipt of one of the following documents:
- (a) Certification from the Principal and the third-party liability claimant(s) that the liability claim should be paid. The certification shall be worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted:

CERTIFICATION OF VALID CLAIM

The undersigned, as parties [insert principal name] and [insert name and address of third-party claimant(s)], hereby certify that the claim of bodily injury and/or property damage caused by a [insert

"sudden" and/or "nonsudden" accidental occurrence arising from operating [insert Principal's name and facility type(s) hazardous waste "treatment", "storage" or disposal" facility/transportable treatment unit (TTU)] should be paid in the amount of \$ [insert dollars].

[Signatures]

Principal

(Notary) Date

[Signatures]

Claimant(s)

(Notary) Date

(b) A valid final court order establishing a judgment against the Principal for bodily injury or property damage caused by sudden or nonsudden accidental occurrences arising from the operation of the Principal's facility/TTU or group of facility(ies)/TTU(s).

14. In the event of combination of this guarantee with another mechanism to meet liability requirements, this guarantee will be considered primary coverage.

I hereby certify that the wording of this guarantee is identical to the wording as specified in California Code of Regulations, title 22, section 66264.151, subsection(h)(2) and is being executed in accordance with the requirements of California Code of Regulations, title 22, division 4.3, chapter 14 and 15, article 8.

Effective Date: March 23, 2016

CHEVRON CORPORATION

Patricia E. Yarrington

Patricia E. Yarrington
Vice President and Chief Financial Officer

[Signature]

Assistant Secretary

CORPORATE GUARANTEE FOR CLOSURE OR POST-CLOSURE CARE

Department of Toxic Substances Control Financial Responsibility Section 8800 Col Center Drive
 Sacramento, California 95826

Guarantee made this 23rd day of March, 2016, by CHEVRON CORPORATION, a business corporation organized under the laws of the State of Delaware, herein referred to as guarantor, to the Department of Toxic Substances Control (DTSC), obligee, on behalf of our subsidiary Chevron U.S.A. Inc. of 6001 Bollinger Canyon Road, San Ramon, California.

This guarantee is made on behalf of the Chevron U.S.A. Inc., which is our subsidiary of Chevron Corporation, to the DTSC.

RECITALS

1. Guarantor meets or exceeds the financial test criteria and agrees to comply with the reporting requirements for guarantors as specified in California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8, section 66264.143, subsection (l), section 66264.145, subsection (f), section 66265.143, subsection (e), and section 66265.145, subsection (e).
2. Chevron U.S.A. Inc. owns at least 50 percent of the voting stock of and/or operates the following hazardous waste management facility(ies)/transportable treatment unit(s) (TTU) covered by this guarantee:

Chevron U.S.A. Inc.

CAD008336901			
Chevron U.S.A. Inc.	Closure	\$	3,088,788
El Segundo Refinery	Post-Closure	\$	11,481,224
324 West El Segundo Blvd.			
El Segundo, CA 90245			
CAT080010283			
Chevron U.S.A. Inc.			
Westside Disposal Facility (aka EPC	Post-Closure	\$	1,272,285
Westside)			
SE 1/4 Section 25, T31E, R22E, MDBM			
Fellows, CA			
CAD009114919			
Chevron U.S.A. Inc.	Closure	\$	1,490,963
Richmond Refinery	Post-Closure	\$	16,603,967
841 Chevron Way			
Richmond, CA 94801-0627			
CAD043237486			
Chevron U.S.A. Inc.	Closure	\$	87,957,176
940 Hensley Street	Post-Closure	\$	19,533,914
Richmond, CA 94804			

Chevron Chemical Company (a division of Chevron U.S.A. Inc.)

Docket #15A9798-005
 Calspray Site
 135 Walker Street
 Watsonville, CA 95076

Work \$ 662,776

3. "Closure plans" and "postclosure plans" as used below refer to the plans maintained as required by California Code of Regulations, title 22, division 4.5, chapters 14 and 15, article 8, for the closure and postclosure care of facilities/TTUs(s) as identified above.
4. For value received from Chevron U.S.A. Inc., guarantor guarantees to DTSC that in the event that Chevron U.S.A. Inc. fails to perform closure and postclosure care of the above facility(ies)/TTU(s) in accordance with the closure or postclosure plans and other permit or interim status requirements whenever required to do so, the guarantor shall do so or establish a trust fund as specified in California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8, as applicable, in the name of Chevron U.S.A. Inc. in the amount of the current closure or postclosure cost estimates as specified in California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8.
5. Guarantor agrees that if, at any time during or at the end of any fiscal year before the termination of this guarantee, the guarantor fails to meet the financial test criteria, guarantor shall send within 90 days, by certified mail, notice to DTSC and to Chevron U.S.A. Inc. that he or she intends to provide alternate financial assurance as specified in California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8 as applicable, in the name of Chevron U.S.A. Inc. Within 120 days after the end of such fiscal year or other occurrence, the guarantor shall establish such alternate financial assurance unless Chevron U.S.A. Inc. has done so.
6. The guarantor agrees to notify DTSC by certified mail of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), United States Code, naming guarantor as debtor within ten (10) days after commencement of the proceeding.
7. Guarantor agrees that within 30 days after being notified by DTSC of a determination that guarantor no longer meets the financial test criteria or that he or she is disallowed from continuing as a guarantor of closure or postclosure care, he or she shall establish alternate financial assurance as specified in California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8, as applicable, in the name of Chevron U.S.A. Inc. unless Chevron U.S.A. Inc. has done so.
8. Guarantor agrees to remain bound under this guarantee notwithstanding any or all of the following: amendment or modification of the closure or postclosure plan, amendment or modification of the permit, the extension or reduction of the time of performance of closure or postclosure, or any other modification or alteration of an obligation of the owner or operator pursuant to California Code of Regulations, title 22, division 4.5.
9. Guarantor agrees to remain bound under this guarantee for as long as Chevron U.S.A. Inc. shall comply with the applicable financial assurance requirements of California Code of Regulations, title 22, division 4.5 for the above listed facilities/TTUs, except as provided in paragraph 10 of this agreement.
10. Guarantor may terminate this guarantee by sending notice by certified mail to DTSC and to Chevron

U.S.A. Inc., provided that this guarantee may not be terminated unless and until Chevron U.S.A. Inc. obtains, and DTSC approve(s), alternate closure and/or postclosure care coverage complying with California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8.

11. Guarantor agrees that if Chevron U.S.A. Inc. fails to provide alternate financial assurance as specified in California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8, as applicable, and obtain written approval of such assurance from DTSC within 90 days after a notice of cancellation by the guarantor is received by DTSC from guarantor, guarantor shall provide such alternate financial assurance in the name of Chevron U.S.A. Inc.

12. Guarantor expressly waives notice of acceptance of this guarantee by DTSC or by Chevron U.S.A. Inc. Guarantor also expressly waives notice of amendments or modifications of the closure and/or postclosure plan and of amendments or modifications of the facility/TTU permit(s).

The parties hereby certify that the wording of this guarantee is identical to the wording specified in California Code of Regulations, title 22, section 66264.151, subsection (h)(1) and is being executed in accordance with the requirements of California Code of Regulations, title 22, division 4.5, chapter 14 and 15, article 8.

Effective date: March 23, 2016

CHEVRON CORPORATION

By Patricia E. Yarrington
Patricia E. Yarrington
Vice President and Chief Financial Officer

By [Signature]
Assistant Secretary

**CHEVRON CORPORATION
ENVIRONMENTAL FINANCIAL RESPONSIBILITY**

ATTACHMENT "A"

SORTED BY STATE
FYE2015 ENDING 12/31/2015

CALIFORNIA

RCRA FACILITIES

Chevron U.S.A. Inc.

CAD008336901 Chevron U.S.A. Inc. El Segundo Refinery P.O. Box 97 El Segundo, CA 90245	Closure Post-Closure	\$ \$	3,088,788 11,481,224
CAT030010283 Chevron U.S.A. Inc. Westside Disposal Facility (aka EPC Westside) 26244 Highway 33 Fellows, CA 93324	Post-Closure	\$	1,272,285
CAD009114919 Chevron U.S.A. Inc. Richmond Refinery P.O. Box 1272 Richmond, CA 94802	Closure Post-Closure	\$ \$	1,490,968 16,603,967
CADD43237486 Chevron U.S.A. Inc. 940 Hensley Street Richmond, CA 94804	Closure Post-Closure	\$ \$	87,957,176 19,533,914

CERCLA FACILITIES ADMINISTERED BY U.S. EPA

Chevron U.S.A. Inc.

California Dept. of Toxic Substances Control v. Chevron U.S.A. Inc. et al Civil Docket No. 98-CV-05412-REC-DLB Purity Oil Sales, Inc. Superfund Site Malaga, CA 93725	Work	\$	10,000,000
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Page 1

**CHEVRON CORPORATION
ENVIRONMENTAL FINANCIAL RESPONSIBILITY**

ATTACHMENT "A"

**SORTED BY STATE
FISCAL YEARS ENDING 12/31/2015**

Waste Disposal, Inc. Superfund Site (CERCLIS ID #CAD980884357 Los Nietos Road at Greenleaf Avenue Santa Fe Springs, CA 90670	Work	\$	7,900,000
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Texaco Inc.

CA D980636761 Texaco Inc. Pacific Coast Pipeline Site 67 East Telegraph Road Fillmore, CA 93016	Work	\$	10,000,000
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Union Oil Company of California

Thomas Ranch 2798 Palisades Drive Corona, CA 92880	Work	\$	651,854
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Texaco Inc.

Thomas Ranch 2798 Palisades Drive Corona, CA 92880	Work	\$	651,854
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STATE ADMINISTERED FINANCIAL ASSURANCE

Chevron Chemical Company (a division of Chevron USA Inc.)

Docket #HSA97/98-005 Calspray Site 135 Walker Street Watsonville, CA 95076	Work	\$	662,776
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Chevron Environmental Management Company

APN 8170-027-006 Former Arbo Box Property 12468 Putnam Street Whittier, CA 90602	Post Closure	\$	135,000
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CHEVRON CORPORATION
ENVIRONMENTAL FINANCIAL RESPONSIBILITY

ATTACHMENT "A"

SORTED BY STATE
FYE2015 ENDING 12/31/2015

Union Oil Company of California

CA920426434 Guadalupe Oil Field Guadalupe, CA	Work	\$	50,000,000
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Chevron U.S.A. Inc.

RWQCH Order No. R2-2001-0036 Chevron U.S.A. Inc. Richmond Refinery P.O. Box 1272 Richmond, CA 94802	Corrective Action	\$	17,884,342
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RWQCB Order No. R2-2015-0030 Former Chevron Chemical Company Pond Site 940 Hensley Street Richmond, CA 94804	Corrective Action	\$	17,870,970
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GEORGIA

STATE ADMINISTERED FINANCIAL ASSURANCE

Union Oil Company of California

HS# 10830 Chemical Specialists and Development, Inc. 2275 Tucker Industrial Rd. Tucker, GA 30084	Corrective Action	\$	7,879,454
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CHEVRON CORPORATION
ENVIRONMENTAL FINANCIAL RESPONSIBILITY

ATTACHMENT "A"

SORTED BY STATE
FYR2015 ENDING 12/31/2015

HAWAII

RCRA FACILITIES

Chevron U.S.A. Inc.

HIT16010005 Chevron U.S.A. Inc. Hawaii Refinery P.O. Box 29789 Honolulu, HI 96820	Post-Closure Corrective Action	\$ \$	163,177 1,994,984
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ILLINOIS

RCRA FACILITIES

Chevron Environmental Management Company

ILD041318861 Chevron Environmental Management Co. Lockport Plant 301 W. 2nd Street Lockport, IL 60441	Post-Closure Corrective Action	\$ \$	301,627 2,982,723
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IOWA

CERCLA FACILITIES ADMINISTERED BY U.S. EPA

ACC Chemical Company

VII-JK (CERCLA Remediation Action) Chemplex Site 4010 21 st Street Orrsunche, IA 52730	Work (Unit 1 & Unit 2)	\$	1,275,000
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CHEVRON CORPORATION
ENVIRONMENTAL FINANCIAL RESPONSIBILITY

ATTACHMENT "A"

SORTED BY STATE
FYE2015 ENDING 12/31/2015

Getty Chemical Company

VIT-JK (CERCLA Remediation Action) Chemplex Site 4010 21 st Street Camarcho, LA 52730	Work (Unit 1 & Unit 2)	\$	1,275,000
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LOUISIANA

RCRA FACILITIES

Chevron Oronite Company, LLC

LAD034199802 Chevron Oronite Company, LLC P.O. Box 70 Belle Chasse, LA 70037	Post-Closure	\$	2,451,072
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STATE ADMINISTERED FINANCIAL ASSURANCE

Chevron Oronite Company, LLC

Site ID No. GD-075-15117 Permit # P-0112 Chevron Oronite Company, LLC Oak Point Plant Highway 23 - P.O. Box 70 Belle Chasse, LA 70037	Closure	\$	3,515,139
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MISSISSIPPI

RCRA FACILITIES

Chevron U.S.A. Inc.

MSD054179403 Chevron U.S.A. Inc. Pascagoula Refinery P.O. Box 1300 Pascagoula, MS 39567	Closure Post-Closure Corrective Action (USEPA R4)	\$ \$ \$	2,786,905 9,340,157 11,963,988
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CHEVRON CORPORATION
ENVIRONMENTAL FINANCIAL RESPONSIBILITY

ATTACHMENT "A"

SORTED BY STATE
FYE 2015 ENDING 12/31/2015

NEW JERSEY

RCRA FACILITIES

Chevron U.S.A. Inc.

NJD081987902 Chevron U.S.A. Inc. Perth Amboy Refinery 1200 State Street Perth Amboy, NJ 08861	Corrective Action	\$	30,250,000
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NEW MEXICO

CERCLA FACILITIES ADMINISTERED BY U.S. EPA

Chevron U.S.A. Inc.

Docket No. 2011-12 Mariano Lake Mine Site 15N, 14W/Sections 11 and 12 McKinley County, NM 87313	Work	\$	1,000,000
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Chevron Mining Inc.

NMD002899094 Questa Mine - Removal Action AOC (Docket 06-09-12) Chevron Mining Inc. Chevron Questa Mine NM Highway 38 Red River Canyon Questa, NM 87556	Work	\$	5,000,000
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NMD002899094 Questa Mine - Early Design AOC (Docket 06-13-12) Chevron Mining Inc. Chevron Questa Mine NM Highway 38 Red River Canyon Questa, NM 87556	Work	\$	6,300,000
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CHEVRON CORPORATION
ENVIRONMENTAL FINANCIAL RESPONSIBILITY

ATTACHMENT "A"

SORTED BY STATE
FYE2015 ENDING 12/31/2015

OHIO

RCRA FACILITIES

Chevron U.S.A. Inc.

OHD004254132
Chevron U.S.A. Inc.
Cincinnati Refinery
P.O. Box 96
North Bend, OH 45052

Corrective Action	5	10,342,000
<small>(Administrative Order on Consent with U.S. EPA region 5)</small>		

STATE ADMINISTERED FINANCIAL ASSURANCE

Union Oil Company of California

CERCLA Docket No. 91-F-90011
Union Oil Company of California
Heath Facility (Consent Order)
840 Heath Road
Heath, OH 43056

Work	\$	4,700,655
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Chevron U.S.A. Inc.

OHD004254132
Chevron U.S.A. Inc.
Cincinnati Refinery
P.O. Box 96
North Bend, OH 45052

Post-Closure (Ohio EPA)	\$	206,000
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PENNSYLVANIA

CERCLA FACILITIES ADMINISTERED BY U.S. EPA

Chevron Environmental Management Company

Docket No. CERC-03-2015-0168DC
Metro Container Corporation Site
In and around the Borough of Trainer
Delaware County, PA

Work	\$	129,450
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CHEVRON CORPORATION
ENVIRONMENTAL FINANCIAL RESPONSIBILITY

ATTACHMENT "A"

SORTED BY STATE
FYE2015 ENDING 12/31/2015

TEXAS

RCRA FACILITIES

Chevron Environmental Management Company

TXD007378995			
Chevron Environmental Management Co.	Post-Closure	\$	409,955
Amarillo Plant	Corrective Action	\$	4,516,838
315 South Grand Amarillo, TX 79104			

STATE ADMINISTERED FINANCIAL ASSURANCE

Chevron Environmental Management Company

SWR No. 30004, Docket No. 97-0404-IHW-E	Post-Response	\$	1,096,256
Chevron Environmental Management Company	Action Care		
Port Arthur Facility 2001 B Gulfway Drive Port Arthur, TX 77670			

UTAH

RCRA FACILITIES

Chevron U.S.A. Inc.

UTD092019768			
Chevron U.S.A. Inc.	Post-Closure	\$	774,060
Salt Lake Refinery	Corrective Action	\$	220,000
2351 North 1100 West Salt Lake City, UT 84116			

CHEVRON CORPORATION
ENVIRONMENTAL FINANCIAL RESPONSIBILITY

ATTACHMENT "A"

SORTED BY STATE
PYR2015 ENDING 12/31/2015

CERCLA FACILITIES ADMINISTERED BY U.S. EPA

Chevron U.S.A. Inc.

Docket# CERCLA-08-2003-0014 Chevron U.S.A. Inc. Northwest Oil Drain Salt Lake County, UT 84116	Work	\$	705,000
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WYOMING

RCRA FACILITIES

Chevron Environmental Management Company

WYD088677945 Chevron Environmental Management Co. Casper Plant P.O. Box 307 Evansville, WY 82636	Post-Closure Corrective Action	\$	5,800,000 13,775,000
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PUERTO RICO

CERCLA FACILITIES ADMINISTERED BY U.S. EPA

Chevron Chemical Company (a division of Chevron U.S.A. Inc.)

PRD980763783 Fibers Public Supply Wells Superfund Site Civil Action Number 92-2486 RTE 3 Jobos, Guayama, Puerto Rico 00654	Work	\$	2,500,000
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**CHEVRON CORPORATION
LIABILITY COVERAGE FOR BOTH SUDDEN AND NON-SUDDEN ACCIDENTIAL
OCCURANCES FOR PROJECT SITES**

ATTACHMENT "B"

<u>Facility</u>	<u>Liability Coverage (Per Occur/Annual Aggregate)</u>
<u>CALIFORNIA</u>	
CAD 008336901 Chevron U.S.A. Inc. El Segundo Refinery P.O. Box 97 El Segundo, CA 90245	Sudden Occurrences - \$1 million/\$2 million Non-sudden Occurrences - \$3 million/\$6 million
CAD 009114919 Chevron U.S.A. Inc., Richmond Refinery P.O. Box 1272 Richmond, CA 94802	Sudden Occurrences - \$1 million/\$2 million Non-sudden Occurrences - \$3 million/\$6 million
CAD 043237486 Chevron U.S.A. Inc. 940 Hensley Street Richmond, CA 94804	Sudden Occurrences - \$1 million/\$2 million Non-sudden occurrences - \$3 million/\$6 million
CAT 080010283 Chevron U.S.A. Inc. Westside Disposal Facility (aka EPC Westside) 26244 Highway 33 Fellows, CA 93324	Sudden Occurrences - \$1 million/\$2 million Non-sudden Occurrences - \$3 million/\$6 million
<u>HAWAII</u>	
HTI 60010005 Chevron U.S.A. Inc. Hawaii Refinery P.O. Box 29789 Honolulu, HI 96820	Sudden Occurrences - \$1 million/\$2 million Non-sudden Occurrences - \$3 million/\$6 million

CHEVRON CORPORATION
 LIABILITY COVERAGE FOR BOTH SUDDEN AND NON-SUDDEN ACCIDENTUAL
 OCCURANCES FOR PROJECT SITES
ATTACHMENT "B"
 FYE2014 ENDING 12/31/2014

IOWA

VII-IK (CERCLA Remediation Action) Chemplex Site ACC Chemical Company 4010 21st Street Camanche, IA 52730	Annual Aggregate per site \$10 million OU-1 \$ 2 million OU-2
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VII-IK (CERCLA Remediation Action) Chemplex Site Getty Chemical Company 4010 21st Street Camanche, IA 52730	Annual Aggregate per site \$10 million OU-1 \$ 2 million OU-2
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ILLINOIS

ILD041518861 Chevron Environmental Management Company Lockport Plant 301 W. 2nd Street Lockport, IL 60441	Annual Aggregate per site \$8 million
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MISSISSIPPI

Chevron U.S.A. Inc. Pascagoula Refinery P.O. Box 1300 Pascagoula, MS 39567	USEPA - Sudden Occurrences - \$1 million/\$2 million Non-sudden Occurrences - \$3 million/\$6 million MSDEQ - Annual Aggregate Per site \$10 million
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CHEVRON CORPORATION
LIABILITY COVERAGE FOR BOTH SUDDEN AND NON-SUDDEN ACCIDENTAL
OCCURANCES FOR PROJECT SITES
ATTACHMENT "B"
FYE2014 ENDING 12/31/2014

NEW JERSEY

NJD081981902
Chevron U.S.A. Inc.
Perth Amboy Refinery
1200 State Street
Perth Amboy, NJ 08861

USEPA -
Sudden Occurrences -
\$1 million/\$2 million

UTAH

UTD092029768
Chevron U.S.A. Inc.
Salt Lake Refinery
2351 North 1100 West
Salt Lake City, UT 84116

Sudden Occurrences -
\$1 million/\$2 million
Non-sudden Occurrences -
\$3 million/\$6 million

WYOMING

WYT088677943
Chevron Environmental Management Company
Casper Plant
P.O. Box 307
Evansville, WY 82636

Annual Aggregate -
\$10 million for State

CHEVRON CORPORATION
ENVIRONMENTAL FINANCIAL RESPONSIBILITY
ATTACHMENT C

FYE 2015 UIC WELLS
US EPA Region VIII

<u>Injection Well/Address</u>	<u>Plugging and Abandonment Cost Estimate</u>
Texaco Inc. Southern Ute Well #17 US EPA UIC Permit # CO2530-2693 Location: NWNW Sec. 34 T33N, R9W, S01 La Plata County, Colorado	\$247,074
Texaco Exploration and Production Inc. Valencia Canyon #17-2 US EPA UIC Permit #CO2690-03757 Location: NWNW Sec. 17 T33N, R11W, S01 La Plata County, Colorado	\$247,074
Texaco Exploration and Production Inc. Valencia Canyon #1-2 US EPA UIC Permit #CO2581-03532 Location: NESE Sec. 2 T32N, R12W, S01 La Plata County, Colorado	\$247,074
Chevron Midcontinent, L.P. Well Name: Clark 4-1 WDW US EPA UIC Permit No.: CO2588-03541 Location: NESE Sec. 4 T33N, R11W, S01 La Plata County, Colorado	\$247,074
Total current plugging and abandonment	\$988,296



Report of Independent Accountants

To the Board of Directors of Chevron Corporation:

We have performed the procedures enumerated below, which were agreed to by the management of Chevron Corporation (the "Company"), solely to assist you in respect to certain financial information included in the letter dated March 23, 2016 from the Vice President and Chief Financial Officer of the Company to the Department of Toxic Substances Control - California (the "Letter"). The management of the Company is responsible for the financial information included in the Letter. This agreed-upon procedures engagement was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants. The sufficiency of these procedures is solely the responsibility of those parties specified in this report. Consequently, we make no representation regarding the sufficiency of the procedures described below either for the purpose for which this report has been requested or for any other purpose.

The procedures and the associated findings are as follows:

1. We recalculated the formulas included in the Letter, Alternative II Part A at items 7, 8 and 10, and Part B at items 1, 3, 9, 10 and 12 to determine mathematical accuracy and found no differences.
2. We compared the Net Worth of the Company at December 31, 2015, as stated in the enclosed Schedule A, to the amount set forth as *Total Equity* in the consolidated financial statements included in the Company's 2015 Annual Report on Form 10-K. We found no difference.
3. We compared the Intangible Assets of the Company at December 31, 2015, as stated in the enclosed Schedule A, to a supporting schedule prepared by the Company from its accounting records. We also recalculated the mathematical accuracy of the supporting schedule. We found no exceptions as a result of the procedures.
4. We compared the Tangible Net Worth of the Company, as stated in Schedule A, to the corresponding amount as stated in the Letter, Alternative II Part A at item 5, and Part B at item 7. We found no difference.
5. We compared the Total Assets in the U.S. of the Company at December 31, 2015, which amounted to \$72,891,000,000, as stated in the Letter, Alternative II Part A at item 6 and Part B at item 8 to the amount set forth as Total Assets - United States in Note 14 to the consolidated financial statements included in the Company's 2015 Annual Report on Form 10-K. We found no difference.
6. We recalculated the percentage of the Total Assets in the U.S., as stated in 5 above, of the amount set forth as Total Assets in the consolidated balance sheet included in the Company's 2015 Annual Report on Form 10-K and agreed that this percentage is less than 90% as stated in the Letter, Alternative II Part A at item 9 and Part B at item 11.

PricewaterhouseCoopers LLP, Three Embarcadero Center, San Francisco, CA 94111-4004
T: (415) 498 5000, F: (415) 498 7200, www.pwc.com/us



We were not engaged to and did not conduct an examination, the objective of which would be the expression of an opinion on the specified elements, accounts or items referred to in 1 to 6 above. Accordingly, we do not express such an opinion. Had we performed additional procedures, other matters might have come to our attention that would have been reported to you.

This report is intended solely for the information and use of the Company and the Department of Toxic Substances Control – California, and is not intended to be and should not be used by anyone other than these specified parties.

PricewaterhouseCoopers LLP

March 23, 2016

Schedule A

Tangible Net Worth of Chevron Corporation at December 31, 2015

Net Worth	\$153,886,000,000
Intangible Assets	<u>(4,877,000,000)</u>
Tangible Net Worth of Chevron Corporation	<u>\$149,009,000,000</u>

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4 Corp 41 Cont 42 Loan 43 PPE 44 CDS 45 CDS Tot 46 Muni 47 Ex- 48 Govt 49 IRS 50 IRS Vol 51 Sp-Cont

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Key	Symbol	Company	Industry	Market Cap	Price	Volume	Market Cap	Price	Volume	Market Cap	Price	Volume
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UNITED STATES SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

Form 10-K

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2015
OR
 TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934
For the transition period from _____ to _____
Commission File Number 001-90366

Chevron Corporation
(Exact name of registrant as specified in its charter)

Delaware	94-0890210	6601 Bollinger Canyon Road, San Ramon, California 94583-2324
(State or other jurisdiction of incorporation of organization)	(I.R.S. Employer Identification No.)	(Address of principal executive offices) (Zip Code)

Registrant's telephone number, including area code (925) 842-1000
Securities registered pursuant to Section 12(b) of the Act:

Title of Each Class	Name of Each Exchange on Which Registered
Common stock, par value \$.75 per share	New York Stock Exchange, Inc.

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.
Yes No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act.
Yes No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.
Yes No

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer Accelerated filer Non-accelerated filer Smaller reporting company
(Do not check if a smaller reporting company)

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes No

Aggregate market value of the voting and non-voting common equity held by non-affiliates computed by reference to the price at which the common equity was last sold, or the average bid and asked price of such common equity, as of the last business day of the registrant's most recently completed second fiscal quarter — \$181,330,939,081 (As of June 30, 2015)

Number of Shares of Common Stock outstanding as of February 15, 2016 — 1,863,156,295

DOCUMENTS INCORPORATED BY REFERENCE
(To The Extent Indicated Herein)

Notice of the 2016 Annual Meeting and 2016 Proxy Statement, to be filed pursuant to Rule 14a-6(b) under the Securities Exchange Act of 1934, in connection with the company's 2016 Annual Meeting of Stockholders (in Part III)

XIX. Corrective Action Plan

Table of Contents

A. Corrective Action

XIX. Corrective Action Plan

A. Corrective Action

The RCRA Part B permit issued by EPA in 1992 required the Chevron Richmond Refinery to implement a corrective action program with respect to certain solid waste management units (SWMUs) identified in the RCRA Facility Assessment.

As required by the permit, Chevron completed a Current Condition Report, a RCRA Facility Investigation (RFI), Work Plan, and an RFI Final Report and Summary Report and submitted these documents to the U.S. EPA. Chevron and EPA have negotiated a consent agreement to address the RCRA requirements.

Since submission of these documents to EPA, the California Regional Water Quality Control Board (RWQCB), San Francisco Bay Region, through the authority given by California Senate Bill 1082 (a.k.a., the Calderon Act), has been designated as lead agency for purposes of RCRA Corrective Action. The RWQCB is currently overseeing remediation being conducted by Chevron at the Richmond Refinery under the current Waste Discharge Order #R2-2011-0036 issued on June 13, 2011. The HWTSE is not listed in this order as a SWMU requiring any investigation or reporting. Any further corrective action requirements at the Refinery will be identified by the RWQCB and included in the Waste Discharge requirements.

There are no land disposal units within the HWTSE. Inside the Refinery, the Landfarms and Hydropits were closed as hazardous waste disposal units in 2001 and 1992 respectively.